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RESEARCH ARTICLE

The Impact of School Teachers Awareness of Student Cyber Security

Osman Sirajeldeen Ahmed[1], Alaa Zuhir Al Rawashdeh[2], Asma Rebhi Al Arab[3], Asma Sirageldin Ahmed[4], Saeed Ameen Nasef[5], Elsayed Mohamed Abd elrahman[6]

[1]University of Khorfakkan, College of Arts, Sciences and Information Technology, P.O. Box:18119, Khorfakkan, Sharjah UAE

[2,3,5] Ajman University, UAE

[4,6] University of Science and Technology of Fujairah, UAE

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***Corresponding Author:**

osman.siraj@ukf.ac.ae

ABSTRACT

The study objectives to identify the awareness of school- teachers about the importance of electronic security for students through studying a few social variables and the relationship of the expertise of teachers with this awareness, Applied in private schools in Emirate Ajman. A survey was conducted of a sample of school teachers at 29 private schools in Ajman. Stratified random sample for schools in the Emirate of Ajman have been used and then a systematic random sample of 172 teachers in the schools were chosen as the target population representation. The most important finding of the study that there is a statistically significant relationship between specialization and teacher awareness of the importance of students 'safety and security electronically.

1. INTRODUCTION

There are few studies and initiatives to ensure the safe use of the electronic information network among school students in educational institutions in the Arab countries. This research is an attempt to address this gap in online education by shedding light on this social and educational problem in an attempt to develop a culture of electronic safety among school students in the United Arab Emirates.

The importance of the research is due to providing a knowledge reference that supports the UAE's orientations towards achieving protection for students in general and electronic protection for students in the Emirate of Ajman particular in line with social and moral responsibility towards students in the country in a manner consistent with the UAE vision [1-6].

This study is of particular importance for the Emirate of Ajman, as it is the first field study that seeks to measure the awareness of school' teachers about the concept of electronic security.

This study examines the awareness of schools' teachers in the Emirate of Ajman twards the electronic security of students through several indicators that we summarize in the use of a smartphone, student interaction with websites and social media applications, student problems that threaten student safety electronically, and laws for protection against cybercrime and electronic crime. We used a measure based on three options: yes, sometimes, no, according to the variables of gender, age, nationality, educational qualification, experience and specialization among school teachers.

The education sector represents one of the most prominent systems that has had to deal with the repercussions of the crisis [7]. Imposing the application of the principle of social distancing prevents face-to-face teaching and depends mainly on online teaching and learning systems [8]. However, these e-Learning systems need to be effective and safe to ensure a regular and continuous course of interaction among students and between students and their teachers [9].

2. RESEARCH PROBLEM

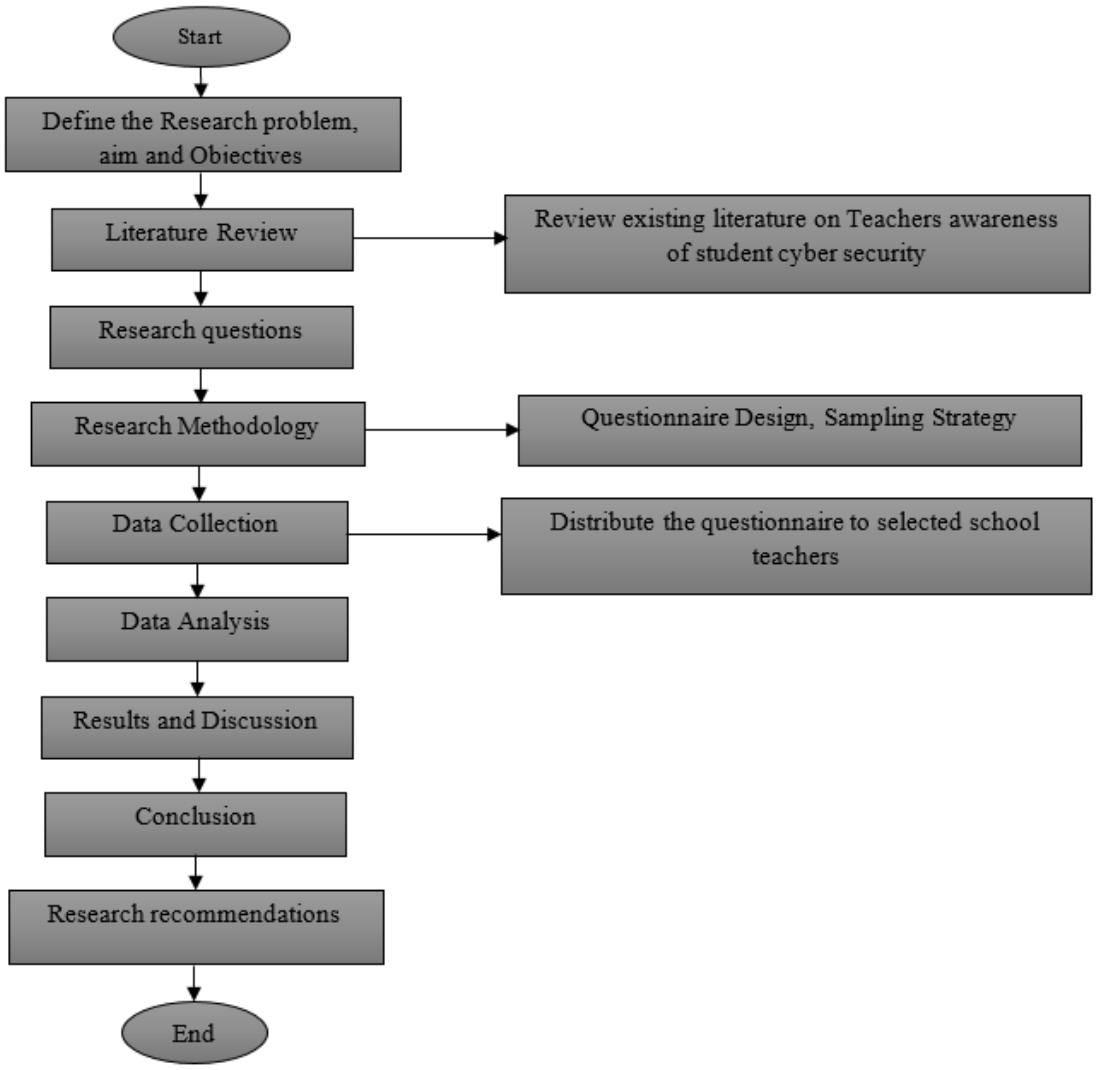
The study seeks to measure the awareness of school' teachers in the Emirate of Ajman of electronic security for school students by clarifying the relationship between school teachers 'awareness of student protection electronically and some social variables, by studying teacher responses to a number of indicators that relate to students' uses of information technology technologies, websites and social media applications.

3. RESEARCH QUESTION

SQ1. What is the relationship of teachers' awareness of cyber security for students and each social variable?

SQ2**.** Is there any significant relationship at the level of significance ($\alpha \leq 0.05$) in the degree of school-teachers' awareness of electronic security for students due to the study variable specialization?

4. METHODOLOGY



4.1. Study sample

This study uses a descriptive survey approach; a survey was conducted of a sample of school teachers at 29 private schools in the Emirates of Ajman. Stratified random sample for schools in the Emirate of Ajman had been used then a sample size formula by Yamane (1967) n = N/1 + N (e2) was used to calculate the sample size. Where n is sample size, e is level of error tolerance and N is the population size which consisting of 300 teachers. Thus, n obtained was 172 teachers as the target population representation. A total of 145 valid questionnaires were returned. Table 1 shows the demographic information for the participants.

4.2. Study instrument

A two-part survey has been developed based on previous studies. The first part of the questionnaire includes the demographic information of the participants of the study. In second part consists of 21 three-level Likert Scale items to investigate the awareness level among teachers of their students' cybersecurity. Then those answers categorized into equal three range levels through following equation: the length of category = (maximum value - minimum value) ÷ number of alternatives = (3-1) ÷ 3 = 0.66, as Shown in table 2.

Table 1: Basic information

Variables	Categories	Number	percentage
Gender	Male	53	36.6
	Female	92	63.4
Adage	20-30 year	22	15.2
	31-41 years	75	51.7
	Above 41 years	48	33.1
Nationality	UAE	46	31.7
	Arab Gulf States	7	4.8
	Other Arab countries	92	63.4
	Foreign countries	0	0.0
Qualification	BA	115	79.3
	HD	20	13.8
	M.A	8	5.5
	PhD	2	1.4
Experience	less than one year	4	2.8
	1-3 years	19	13.1
	4-7 years	29	20.0
	Above 7 years	93	64.1
Specialization	Arabic Language	25	17.2
	English Language	18	12.4
	Mathematics	27	18.6
	Social science	18	12.4
	IT	3	2.1
	Art &Music	2	1.4
	Others	52	35.9
Total		145	100.0

Table 2: Distribution of categories

Response	Grades	Extent of Mean
Agree	3	2.34 - 3.00
Undecided	2	1.67 - 2.33
Disagree	1	1.00 - 1.66

4.3. Validity of the study instrument

The study tool was sent to a panel of raters to review the items, which consist of six scholars specialized in Computer science, educational psychology, educational technology, and education measurement to validate it. The items were adjusted according to their comments and recommendations

4.5. Reliability of study instrument

The researchers verified the reliability of the tool by applying it to a pilot sample consisting of 20 teachers from outside of the study using Cronbach's alpha coefficient method. The Cronbach's alpha coefficient was calculated for the entire tool using Statistical Package for the Social Sciences (SPSS), which resulted in a value of 0.88, indicating a good level of internal consistency.

5. PREVIOUS STUDIES

Among the important studies that have been referred to is a study entitled "A proposed perception to develop awareness of the ethics of electronic social communication among university students, which reached results related to the level of awareness of the ethics of electronic social communication between the individual and himself, and between the individual and others [10].

In this article, we adopt a group of studies for researchers in the field of educational and sociology such as Morsi (2016) , this article, on awareness of the negative and positive effects of students in southern Egypt [11]. Also, Abdul Majeed (2018) who pointed out the importance of informing students about the effects of unsafe use of Internet technology [12]. As well as the Sezer, B, & Karaoglan ,F(2015) study, determining the levels of teachers 'awareness in Turkish schools regarding cyber-crime and personal cyber security [13]. Also, from the studies that benefited from this article presented by Kritzinger, E. (2017) on methodologies that help schools learners to become safer online and teach learners the risks related to using the Internet. This research therefore proposes a short-term initiative in the form of a game-based approach, which will assist school learners in becoming more cyber safe and teach learners about the relevant cyber-related risks and threats [14]. R. Ismailova and others (2016) studied the level of awareness of information security of students in the Kyrgyz state and concluded that students should be learn topics related to the safe use of the information network to prevent them from becoming a victim of cybercrime [15].

In addition to the above, there are important Arab studies on electronic safety for school students, for example : Albarashdi (2019), which linked cybercrime and social networking sites and concluded that most cybercrime is linked to the use of Facebook students [16]. In addition, Al Saleem (2013) this study focused on an important aspect of forgetfulness for teachers 'awareness of students' electronic security, which is the number of hours of Internet use for students at the sixth academic level [17].

6. RESULTS & DISCUSSION

For data analysis, researchers used SPSS to perform descriptive analyzes (number, percentage, average, and standard deviation), as well as T-test for independent samples, The one-way analysis of variance (ANOVA) and Fisher's least significant difference post-hoc test (LSD). Levine's test was used to assess the homogeneous of variances.

6.1. Findings related to SQ1

To answer the first study question (What is the relationship of teachers' awareness of cyber security for students and each social variable?) mean scores and standard deviations for the teachers' responses to each of the questionnaire items 1−21 were calculated, as shown in Table 3.

Table 3: Participants' aware of the importance of cybersecurity for schools' students

S.N.	Items	Mean	S.D.
1	I don't allow to my students to use their smartphones in the class	2.40	0.749
2	I do notice the interaction of my students with specific sites on the Internet	2.30	0.891

3	I am willing to know the sites my students browse	2.48	0.698
4	I am aware and interested in the safety of my students	2.41	0.846
5	I am aware of the social media applications that my students interact with	2.36	0.805
6	I think security measures for my students are necessary	2.68	0.714
7	I think my students will never be threatened due to the Internet usage	1. 64	0.877
8	I have information about the UAE's rights of the Child law "Wadimah Law"	1.86	0.846
9	I have received training program about cybersecurity for my students	1.64	0.881
10	I am willing to teach myself about cybersecurity	2.73	0.445
11	I am aware of the cybercrime that my students may be exposed to	2.38	0.890
12	I have information about the UAE's IT crime law	2.58	0.495
13	Schools' students should be taught thoroughly about cyber security	2.92	0.266
14	I allow my students to use the internet with all available means (a mobile smartphone or any type of smart device)	1.65	0.886
15	I am reviewing what has been reviewed by my students on the internet browser	2.14	0.732
16	I do agree to use any type of program that monitors or limits students 'access to certain websites, or downloads of applications	2.72	0.651
17	I have noticed behavioral changes on some of my students due to the internet use	2.10	0.593
18	I don't have any problems with downloading educational resources from untrusted websites to give to my students	2.38	0.890
19	I do you support limiting the hours of students' use of the Internet in my school	2.95	0.215
20	I am aware of the internet safe use policy in my school	2.14	0.652
21	I Know to whom I report if I face cyber security problems in my school.	1.81	0.612
Overall mean for all items		2.331	
Standard deviation		0.6968	

By studying 21 variables, we find teacher responses according to the arithmetic mean and standard deviation, which can be arrange as follows:

The teachers' awareness of the necessity of determining the hours of using the Internet for students ranked first with an average score of 2.95 and a standard deviation of 0.215. This result corresponds to a study that concluded that there is a difference between students 'use of computers and students' awareness of cyber security [18].

Secondly, awareness of the changes that the Internet causes students, with an average score of 2.292, and a standard deviation of 0.266. Thirdly, awareness of the laws against protection against electronic exploitation, where it achieved an average mean of 2.86 and a standard deviation of 0.346. Some scholars see, for example, Solmsand & Saolms and other scholars, that teachers transfer the basic principles of cyber safety to their students, including the legal culture related to protection stimulates the principles of cyber safety for school students [19-25].

Fourth, teachers' awareness shown by taking advantage of the programs they received about electronic protection for students with an average score of 2.73 and a standard deviation of 0.445. As for the fifth variable, which determines the awareness of school teachers about child protection electronically, their agreement to use programs that monitor or limit students 'entry to some Internet sites, or download applications with an average mean of 2.72, and a standard deviation of 0.651.

These are important points that teachers should be aware of given that most students, do not have the skills, capabilities, or knowledge to control the threats resulting from the use of these programs and applications [26-30].

Seventh rank, awareness of the laws of fighting IT crimes in the UAE, with an average score of 2.58 and a standard deviation of 0.495. In the eighth rank, teachers 'awareness of students' protection appears electronically in their desire to specify the websites that students view, with a mean average of 2.48 and a standard deviation of 0.698.

Ninth, teachers' awareness in protecting students of a variable of interest around searching for information related to student safety electronically with an mean of 2.48 and a standard deviation of 0.501. In tenth place comes the awareness of teachers of the importance of receiving training programs on electronic safety for students with an average score of 2.47 and a standard deviation of 0.501. Some scholars such as Kritzinger (2017) , Abbas, N. (2018), Riaz, M., Ahmad et al (2022), Sunthornwat, R., et al (2018) and Peerajit, W, et al (2018) emphasize that all school teachers who have access to information and communications technology should learn how to identify and reduce potential cyber risks and be safe online [14, 31-36].

The variable associated with school teachers 'knowledge of students' use of different search engines is ranked eleventh with an average mean of 2.41 and a standard deviation of 0.846.

Twelfth, teachers 'knowledge of students' use of school phones and smart devices with mean of 2.47 and standard deviation of 0.749.

Thirteenth, awareness of the cybercrime to which school students are exposed, with an average of 2.38 and a standard deviation of 0.890. Fourteenth, weakness awareness of the relationship between the use of websites and the ages of students with an average of 2.30 and a standard deviation of 0.891.

Fifteenth Weak knowledge of social media applications used by students with average of 2.36 and a standard deviation of 0.805. Sixteen teachers are unaware that students have email accounts with an average of 2.30 and a standard deviation of 0.834. Twenty-seventh the weakness of the ability to review online on school computers with an average score of 2.14 and a standard deviation of 0.732.

As for the variables associated with the use of computer laboratories, the use of mobile phones during leisure time in the school, allowing the use of the Internet outside the classes and laboratories designated for that. These are all the lowest levels of awareness among school -teachers to protect and safety students electronically, as they range from the eighteenth to twenty one ranks with mathematical averages They range from 2.10 - 1.81 and standard deviations between 0.652-0.866.

Signs of low levels of vulnerability to the above variables are consistent with other studies presented by learners that revealed that teachers have an average level of awareness about cyber-crime in general [35].

6.2. Findings Related to SQ2

To answer the first study question (Is there any significant relationship at the level of significance ($\alpha \leq 0.05$) in the degree of school -teachers' awareness of electronic security for students due to the study variable specialization?)

LCD test for post-hoc comparisons was also conducted to find out the significance of the differences between the means. The results are detailed in the following section.

Table 4: Multiple comparisons – LSD Test

(I) Specialization	(J) Specialization	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Arabic Lang.	Eng. Lang.	-.02212	.07027	.753	-.1611	.1168
	Mathematics	-.13411*	.06310	.035	-.2589	-.0093
	Social Science	-.18349*	.07027	.010	-.3224	-.0445

	IT	-.19937	.13890	.153	-.4740	.0753
	Others	-.03667	.05533	.509	-.1461	.0727
Eng. Lang.	Arabic Lang.	.02212	.07027	.753	-.1168	.1611
	Mathematics	-.11199	.06918	.108	-.2488	.0248
	Social Science	-.16138*	.07578	.035	-.3112	-.0115
	IT	-.17725	.14177	.213	-.4576	.1031
	Others	-.01455	.06217	.815	-.1375	.1084
Mathematics	Arabic Lang.	.13411*	.06310	.035	.0093	.2589
	Eng. Lang.	.11199	.06918	.108	-.0248	.2488
	Social Science	-.04938	.06918	.477	-.1862	.0874
	IT	-.06526	.13835	.638	-.3388	.2083
	Others	.09744	.05393	.073	-.0092	.2041
Social Science	Arabic Lang.	.18349*	.07027	.010	.0445	.3224
	Eng. Lang.	.16138*	.07578	.035	.0115	.3112
	Mathematics	.04938	.06918	.477	-.0874	.1862
	IT	-.01587	.14177	.911	-.2962	.2644
	Others	.14683*	.06217	.020	.0239	.2698
*. The mean difference is significant at the 0.05 level.						

From the multiple comparisons shown in the above table, it is clear from the following:

a. The result of multiple comparisons (LSD Test) in the table shows that the variation is due to the difference between the average responses of mathematics teachers and the Arabic language in favor of mathematics teachers, where the average difference was (0.134), which is D at the level of significance (0.035).
b. The result of multiple comparisons (LSD Test) in the table shows that the variation is due to the difference between the average responses of social science teachers and the Arabic language in favor of social science teachers, where the average difference was (0.183), which is D at the level of significance (0.010).
c. The result of multiple comparisons (LSD Test) in the table shows that the variation is due to the difference between the average responses of social science teachers and the English language in favor of social science teachers, where the average difference was (0.161) which is D at the level of significance (0.035).

7. CONCLUSIONS

The survey conducted through this study revealed the importance of determining the level of school teachers 'awareness of cybersecurity for their students in light of the increasing importance of cybersecurity, and its serious threats, as well as its important role in preserving our children, our families and our community. UAE school students have high Internet access capabilities, which must be matched by a high level of teacher awareness regarding cybersecurity for students. The research concluded that there is acceptable awareness among school teachers of cybersecurity for students. On the other hand, the study results concluded that there are a number of variables in which statistical measurements indicates the poor awareness of teachers of the importance of cybersecurity for their students, such as they are not well aware of the policy for the safe use of the Internet in their school, and they are not familiar with the measures individuals should take or report if they face cyber security problems in their schools, due to the lack of training programs for school teachers on Cyber security. The study also concluded that there was a statistically significant relationship between specialization and teacher 'awareness of cybersecurity for their students driven mainly by the significant differences between the average responses of mathematics teachers and the Arabic

language in favor of mathematics teachers, and the difference between the average responses of social science teachers and the Arabic language in favor of social science teachers, and the difference between the average responses of social science teachers and the English language in favor of social science teachers.

8. RECOMMENDATIONS

This study suggests several valuable research recommendations that can further enhance our understanding of the of School Teachers awareness of student cyber security. First, future research should consider exploring artificial intelligence, encompassing a broader range student, to provide a more comprehensive view of how local contexts influence cyber security. Additionally, longitudinal studies tracking the evolution of school teachers over time can provide insights into changing perceptions and experiences. Such studies can help policymakers and educators adapt strategies as the student's awareness the consequences of problems resulting from cyber development.

Comparative research, comparing school teacher's experiences with those in deference school, can shed light on disparities and unique challenges faced by student's cyber security. Furthermore, it is crucial to incorporate the perspectives of various stakeholders, including teachers, school administrators, and students themselves, to gain a comprehensive understanding of the home-schooling ecosystem during the pandemic

DECLARATIONS

Author contributions

Conceptualization, O.S.A; methodology O.S.A.; software, A.S.A.; validation, A.R.A., O.S.A., and A.Z.A.; formal analysis, A.S.A; investigation A.Z.A.; resources O.S.A.; data curation, O.S.A.; writing—original draft preparation, O.S.A. and A.S.A.; writing—review and editing, A.R.A.; visualization O.S.A.; supervision, A.R.A.; project administration, A.S.A.; funding acquisition, A.Z.A. All authors have read and agreed to the published version of the manuscript.

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