Computer Anxiety and ICT Utilization of Program Heads in a State University

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***Abstract*—This study aimed to determine the correlation between ICT utilization and computer anxiety among the program heads of a state university given the increase in ICT usage requirements due to the Covid-19 pandemic.**

The study was carried out in a correlational survey model. All 33 faculty members designated as program heads across all courses in Eastern Samar State University colleges were involved as respondents. The data were assessed using a computer anxiety test (CARS) and a test for the level of computer utilization. Descriptive statistics and Pearson's r correlation coefficient using MS Excel and free online software calculators were used to analyze the data.

The result showed that ICT utilization was generally high, and the majority of the respondents had no computer anxiety. It was found further that a moderate negative linear relationship exists between the respondents' level of computer anxiety and their level of ICT utilization. The increase in ICT utilization may suggest a decrease in computer anxiety among the respondents and therefore reject the null hypothesis. Hence, due consideration of psychological fitness to use ICT in the context of education supervision was suggested. Further study involving other members of the organization was also suggested to explore or strengthen these findings, or otherwise.

***Index Terms*—Computer anxiety, ICT utilization, techno-phobia, techno stress.**

I. Introduction

The COVID-19 pandemic has driven businesses, sports activities, and schools worldwide to transition to internet platforms affecting over 1.2 billion youngsters in 186 countries. As a result, education has undergone significant transformations wherein schools were forced to engage in learning using e-learning, or online learning, in which instruction is done remotely and via digital platforms [1].

Online learning uses information and communication technology (ICT) to create educational resources, deliver teaching, and manage a program [2]. However, some studies in US public schools suggest that only 60% of students engaged in online learning from 2019 to 2020. One of the perceived causes of the problem was the failure of instructional leaders to recognize the significant role of education supervisors in providing meaningful and engaging pedagogical practices. According to Hrastinski (2008), educators, companies, and institutions must have a thorough awareness of the benefits and drawbacks of online learning for it to be effective and efficient [3].

Manuscript received March 21, 2022; revised May 25, 2022.

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A. ICT Utilization

Generally, ICT enables effective, fast storing/sorting and transmitting of information, reduces information quantity, and improves strategies for professional operations with a high degree of reliability. Such qualities made ICT central to any economy and people's quality of life in any society. It drives many of today's innovations and will still likely be relevant in the coming decades. This part of technological development seems to dominate all the advancements made so far. The integration of ICT into the modes of operation of different professional practices has affected human development in an epic proportion. The use of ICT in education aids in teaching and learning and the integration of administrative processes while ensuring a modern administration style that allows for quicker administrative activities. However, both on a pedagogical and administrative level, effective ICT integration in schools is proving problematic due to certain factors such as Computer Anxiety [4]. Moreover, most studies focus only on the teaching and learning process, while the aspect of instructional supervision remains unexplored. Certain studies claim that supervisors of instruction have a critical role in the enhancement of pedagogical and administrative practices to improve work performance and learning outcomes for students [5].

B. Computer Anxiety

Computer anxiety is defined as a fear or aversion to using the computer or Internet, or it has to do with the negative impacts on Internet users [6]. Berg-Beckhoff *et al*. (2018) described computer anxiety as the following behavioral and cognitive symptoms: Excessive caution with computers, avoidance of computers, negative remarks about computers, and attempts to reduce the use of computers [7]. They generally considered such psycho-social consequences as technostress or computer phobia [8], [9]. The complaints of somatic distress wherein computer-anxious individuals were half likely to engage in self-training using computer applications compared to non-anxious ones correlate to computer anxiety. The managers of US companies lost around 42 billion dollars per year due to computer anxiety [10].

While ICT is undeniably important to society, especially in education, working with computers can be an anxiety-provoking experience that has psychological implications on the user [11] and could affect their productivity and work performance, as shown in certain studies [12]. Hence, the author opted to investigate the respondent's status in terms of computer anxiety, ICT utilization, and whether a statistically significant linear

doi: 10.18178/ijiet.2022.12.10.1727

relationship exists between the two.

II. Objectives

This study aimed to investigate the linear correlation between the level of ICT utilization and computer anxiety among the respondents.

Specifically, this study aimed to determine:

1) The respondent's level of Computer Anxiety
2) The respondent's level of utilization of ICT.
3) IF a significant linear correlation exists between the respondent's Level of Computer Anxiety and their Level of ICT Utilization.

Research Hypothesis:

Ho: r = 0 There is no significant linear relationship between respondents' level of computer anxiety and their level of ICT utilization.

III. Methodology

A. Research Design

This study utilized a correlational design to investigate the relationship between computer anxiety and the level of ICT utilization of Eastern Samar State University or ESSU's program heads within the purview of their role as instruction supervisors.

B. Respondents and Sampling

A total enumeration of thirty-three (33) program heads across all courses and colleges of Eastern Samar State University was identified as respondents. They were chosen in view of their organizational functions being supervisory in character relevant to and within the purview of Organizational Management of which this study was purposefully pursued.

C. Data Gathering Procedure

In this study, the author adopted two sets of instruments merged into a single instrument for convenience. The first was from a Computer- Anxiety Rating Scale (CARS) instrument developed and validated by Heinssen, Glass, and Knight (1987) [9] and second was taken from an ICT usage instrument by Gulbahar & Guven (2008) employed in their study entitled "A Survey on ICT Usage and the Perceptions of Social Studies Teachers in Turkey" [13].

The author personally distributed and collected thirty-three (33) instruments for thirty-three (33) program heads who were identified as respondents during the last quarter of SY 2021-2022. Use of informed consent embedded in the questionnaire as well as confidentiality of the data were duly conveyed to the respondents as required by the policies and principles of ethics in research.

D. Data Analysis

After collecting all instruments from the respondents, the author tallied the test for anxiety and the test for ICT utilization using MS Excel. The same were described using descriptive statistics such as Frequency, Percentage, and Mean. Scores were computed based on the following 5 Likert scales:

Test for Anxiety

5 - Strongly Agree
4 - Agree
3 - Neutral
2 - Disagree
1 - Strongly Disagree

Note: * indicates items which were positively worded and were reverse scored. Higher scores indicate higher levels of computer anxiety.

And their interpretation based on the following schemes:

E. Computer Anxiety

The respondents' CARS scores were divided into three groups using a technique proposed by Shah *et al.* (2011): (a) **"No Anxiety"** for the lower range of scores, (b) **"Low Anxiety"** for the mid-range values, and **"Moderate/High Anxiety"** for the higher range of scores. If the range of scores obtained after participants completed the CARS is 19–95, then dividing the range of 76 (95 minus 19) by three equals 25; thus, the lower range ("No Anxiety") becomes 19–44, the mid-range ("Low Anxiety") becomes 45–69, and the higher range ("Moderate/High Anxiety") becomes 70–95 [14].

Test for ICT utilization

5 - Always
4 - Often
3 - Sometimes
2 - Rarely
1 - Never

Note: Higher computed Mean indicates a higher level of ICT Utilization.

F. ICT Utilization

5-likert Scale Scoring range suggested by Muhammed (2016) was utilized [15]:

1 - 1.80 represents (Never).
1.81 - 2.60 represents (Rarely).
2.61 - 3.40 represents (Sometimes).
3.41 - 4.20 represents (Often).
4.21 - 5.00 represents (Always).

A correlation study was performed to assess whether or not there is a link (association) between the respondents' degree of anxiety and their level of ICT utilization. Before such analysis, a data normality test had to be conducted, which was crucial in determining the statistical method herein utilized, according to Mishra *et al.* (2019). Though there were several methods for assessing the Normality of data distribution, the author opted to use Kolmogorov-Smirnov Normality Test. Parametric tests are used to compare groups when our data has a normal distribution; otherwise, non-parametric approaches are utilized [16].

G. Strength of Relationship

TABLE I: R Value and Strength of Relationship

Absolute Value of r	Strength of Relationship
$r<0.3$	None or very weak
$0.3<r<0.5$	Weak
$0.5<r<0.7$	Moderate
$r>0.7$	Strong

To determine the strength of association between the variables involved, the scheme of interpretation in Table I

showing the r value—strength equivalency was used. It means that a computed r value of less than 0.3 is considered to have "None" or "Very weak" strength of association. If the r value is equal to 0.3 but less than 0.5, then the strength of association is "weak". If the r value is equal to 0.5 but less than 0.7, then the association is "Moderate." Finally, any value of r that is greater than 0.7 is considered "strong".

H. Direction of the Relationship

The direction of the relationship between variables is either positive or negative depending on how close the computed r value to the positive or negative polarity. $r = 1$ indicates perfect positive correlation and $r = -1$ indicates perfect negative correlation.

IV. Results and Discussion

In response to objective number 1, which was to determine the respondent's level of computer anxiety, The computed CARS scores revealed that the highest was 48 - interpreted as "Low Anxiety," and the lowest was 34 - interpreted as "No Anxiety" (*see Table II*). The descriptive interpretation of such scores was limited only to "Low Anxiety" and "No Anxiety," respectively. As shown further in Fig. 1, the former constituted 21% while the latter constituted 79% of the total responses. It entails that most of the respondents have no computer anxiety, and the number of low anxiety cases was minimal to be considered a matter of concern.

TABLE II: Level of Computer Anxiety

Respondent	Score	Description
1	34	No Anxiety
2	35	No Anxiety
3	44	No Anxiety
4	45	Low Anxiety
5	48	Low Anxiety
6	38	No Anxiety
7	40	No Anxiety
8	38	No Anxiety
9	38	No Anxiety
10	44	No Anxiety
11	42	No Anxiety
12	38	No Anxiety
13	45	Low Anxiety
14	43	No Anxiety
15	47	Low Anxiety
16	41	No Anxiety
17	41	No Anxiety
18	37	No Anxiety
19	35	No Anxiety
20	45	Low Anxiety
21	45	Low Anxiety
22	39	No Anxiety
23	34	No Anxiety
24	39	No Anxiety
25	43	No Anxiety
26	38	No Anxiety
27	38	No Anxiety
28	37	No Anxiety
29	43	No Anxiety
30	38	No Anxiety
31	47	Low Anxiety
32	39	No Anxiety
33	42	No Anxiety
Mean	**40.6**	**No Anxiety**

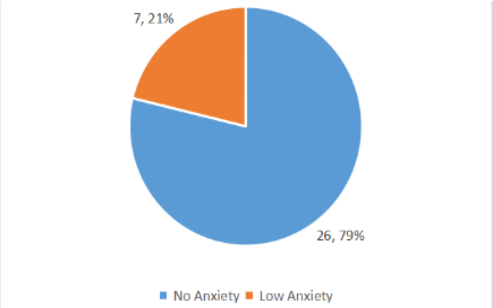

Fig. 1. Computer anxiety frequency and percentage distribution.

TABLE III: Level of ICT Utilization

Questions		Mean	Description
Q1	Word Processors (Word etc.)	3.94	Often
Q2	Spreadsheets (Excel etc.)	3.61	Often
Q3	Presentation Software (PowerPoint etc.)	3.79	Often
Q4	Database Systems & Applications	2.18	Rarely
Q5	Computer Aided Instruction Software	2.76	Sometimes
Q6	Web Page Development Tools (FrontPage, Dreamweaver etc.)	2.15	Rarely
Q7	Web Browsers (Google, Explorer etc.)	4.45	Always
Q8	Search Engines (google, yahoo etc.)	4.27	Always
Q9	Electronic Mail (e-mail)	4.21	Always
Q10	Discussion Lists and Newsgroups	3.55	Often
Q11	Chat and/or Forum	3.70	Often
Q12	Electronic Encyclopedia and/or Atlas	3.21	Sometimes
Q13	Instructional Films (video, CD, VCD etc.)	3.52	Often
Q14	Overhead Projector	3.12	Sometimes
Q15	Opaque Projector and/or Document Camera	2.73	Sometimes
Q16	Multimedia Computer	3.33	Sometimes
Q17	Computer – Projector System	3.21	Sometimes
Q18	Internet/Web Environment	3.79	Often
	Overall Mean	**3.42**	**Often**

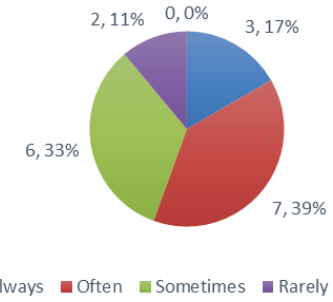

Fig. 2. Frequency & percentage distribution of ICT utilization.

In response to objective number 2, which was to determine the respondent's level of ICT utilization, the result shows the

computed Means of scores per question, which correspond to a specific ICT usage (see Table I, Fig. 2 and Fig. 3). The highest computed mean was 4.45 for Q7, interpreted as "Always" and the lowest computed mean was 2.15 for Q6, interpreted as "Rarely". The overall computed mean is 3.42, which is interpreted as "Often". It means that the respondents were often engaged with the use of ICT in the performance of their supervisory functions. The same can be deduced in Fig. 4, wherein the highest frequency, as well as percentage distribution of ICT utilization, was attributed to "Often" constituting 39%, followed by a 33% "Sometimes", 17% "Always", 11% "Rarely", while none have been recorded for "Never".

A. Test of Normality

As mentioned in the methodology pages, a Normality test was necessary to determine the appropriate method of statistical analysis to be utilized. As suggested by Mishra *et al*. (2019), the basic principle behind Parametric tests were used to compare groups when our data had a normal distribution; otherwise, non-parametric approaches were utilized [16]. In this study, Kolmogorov-Smirnov Test was used. The said calculation obtained a 0.14645 K-S (D) value and 0.43746 p-value for Computer Anxiety while 0.1738 K-S value and 0.24233 p-value for ICT Utilization, respectively. Based on its principle, if the value of K-S (D) is higher than the p-value, your data is not normally distributed [17]. In view thereof, the results found the two groups of variables to be of Normal distribution. Hence, the author used a parametric test of correlation called Pearson-r, which assesses the strength of a linear relationship between two continuous variables, with $r = 1$ indicating perfect positive correlation and $r = -1$ indicating perfect negative correlation [18], [19].

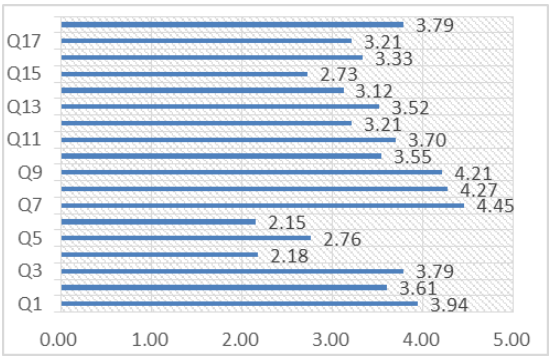

Fig. 3. Calculated mean per question.

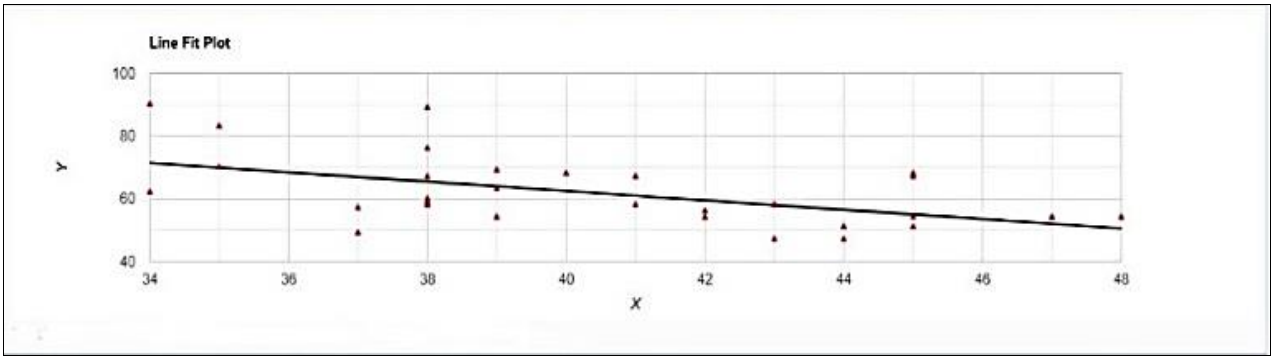

Fig. 4. X & Y line fit plot.

B. Correlation Analysis

Hypothesis

Ho: $r = 0$ There is no significant linear relationship between respondents' level of computer anxiety and their level of ICT utilization

Ha: $r \neq 0$ There is a significant linear relationship between respondents' level of computer anxiety and their level of ICT utilization

X = Level of Computer Anxiety

Y = Level of ICT Utilization

Significance $\alpha = 0.05$

Decision Rule

If $p \leq \alpha$, there is a significant relationship between the variables

If $p \geq \alpha$, there is no significant relationship between the variables

Table IV shows the computed parameter values. The First is the r-value, which is -0.5358 (see Fig. 5 and Table V for its calculation). Such value is slightly closer to -1, which implicates a negative relationship direction, illustrated in Fig. 4, showing a negative slope between variables. Since it is slightly over 0.5, the strength of relationship appears to be in the moderate category. The Second is the P-value of 0.00131 (see Fig. 6 for p-value calculation) seems to be lesser than that of the r value and implicates a significant relationship between variables as indicated in the decision rule. The rests are significant values in the computation of both the r- value and the p-value, such as Size (n) for the number of respondents involved and covariance, which measures the direction of the relationship between two variables. A positive covariance means that both variables simultaneously tend to be high or low. In contrast, a negative covariance, as reflected in Table IV, means that the other tends to be low when one variable is high.

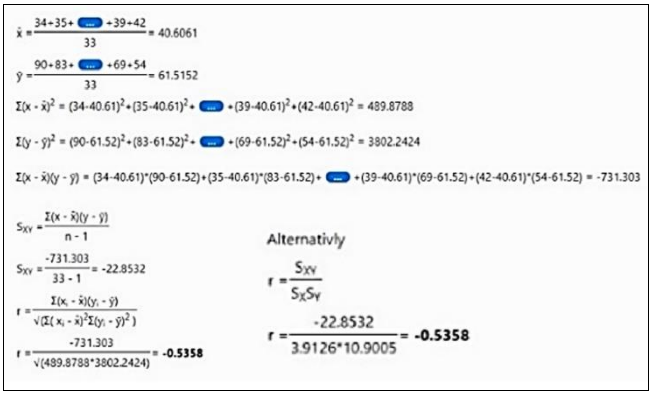

Fig. 5. Pearson r calculation.

Fig. 4 illustrates the form and direction of the relationship between the variables involved. Computer anxiety on the X axis and ICT utilization on the Y axis.

TABLE IV: PARAMETER VALUES

Parameter	Value
Pearson correlation coefficient (r)	-.5358
P-value	0.00131
Covariance	-22.8532
Size (n)	33

Test calculation

$$S = \sqrt{\left(\frac{1 - r^2}{n - 2}\right)}$$

$$S = \sqrt{\left(\frac{1 - (-0.5358)^2}{33 - 2}\right)} = 0.1516$$

$$stat = \frac{r - 0}{S}$$

$$stat = \frac{-0.5358 - 0}{0.1516} = -3.5335$$

$p = p(x \leq -3.5335) = 0.0006549$

$p\text{-value} = 2 * Min(p, 1 - p) = 2 * Min(0.0006549, 0.9993) = 0.00131$

Fig. 6. p-value calculation.

TABLE V: X AND Y VALUES

$X - M_x$	$Y - M_y$	$(X - M_x)^2$	$(Y - M_y)^2$
-6.606	28.485	43.64	811.387
-5.606	21.485	31.428	461.599
3.394	-10.515	11.519	110.568
4.394	6.485	19.307	42.053
7.394	-7.515	54.67	56.478
-2.606	-3.515	6.792	12.356
-0.606	6.485	0.367	42.053
-2.606	5.485	6.792	30.084
-2.606	-1.515	6.792	2.296
3.394	-14.515	11.519	210.69
1.394	-5.515	1.943	30.417
-2.606	14.485	6.792	209.811
4.394	-7.515	19.307	56.478
2.394	-14.515	5.731	210.69
6.394	-7.515	40.882	56.478
0.394	-3.515	0.155	12.356
0.394	5.485	0.155	30.084
-3.606	-4.515	13.004	20.387
-5.606	8.485	31.428	71.993
4.394	5.485	19.307	30.084
4.394	-10.515	19.307	110.568
-1.606	1.485	2.579	2.205
-6.606	0.485	43.64	0.235
-1.606	-7.515	2.579	56.478
2.394	-3.515	5.731	12.356
-2.606	-2.515	6.792	6.326
-2.606	-3.515	6.792	12.356
-3.606	-12.515	13.004	156.629
2.394	-3.515	5.731	12.356
-2.606	27.485	6.792	755.417
6.394	-7.515	40.882	56.478
-1.606	7.485	2.579	56.023
1.394	-7.515	1.943	56.478
Mx: 40.606	**My: 61.515**	**Sum: 489.879**	**Sum: 3802.242**

V. CONCLUSION

Integrating ICT into the modes of operations in various professional practices is generally beneficial. It has qualities which impacted human development quite positively for many years. However, some drawbacks like computer anxiety were presently considered one of the areas of concern. In the education sector, the Covid-19 pandemic forced school systems to pivot their delivery of instructions from face-to-face classes to online instructions, which drastically increased its ICT utilization requirements. Specific studies in the US suggested that it has negatively affected both the pedagogical and administrative levels. One of the significant causes identified was the failure of the academic leaders to provide relevant pedagogical practices instead of merely looking at the teacher-student factors. Working with computers can be an anxiety-provoking experience and has psychological implications on the user, which could affect performance. It was perceived that the higher the demand for computer utilization, the higher the level of computer anxiety among the respondents. A null hypothesis was tested to this effect. The result showed that ICT utilization was generally high, with an overall computed mean of 3.42 interpreted as "Often". It implies that most of the respondents often engaged with ICT to perform their supervisory functions. The majority of the respondents, or 79 %, were found as well to have no computer anxiety, while the rest manifested a negligible 21% low anxiety. Furthermore, a moderate negative linear relationship exists between the variables involved, and the relation was significant considering the p-value of 0.000131 lesser than the Alpha of $\alpha = 0.05$. The increase in ICT utilization may suggest a decrease in computer anxiety among the respondents and vice versa and therefore reject the null hypothesis.

VI. RECOMMENDATION

Having found Computer Anxiety statistically associated and negatively correlated with ICT Utilization, it would be necessary for organizational managers/administrators to consider the variables in their efforts to improve performance as factors in decision making. Indeed, it is not enough that the organization can provide ICT to its workforce. Still, it is equally important to investigate the psychological fitness of the user to engage in work with ICT, and the related psychological risk is statistically real as far as this study is concerned. It is suggested further that the university continue to explore this topic, targeting other organization members to strengthen herein findings or otherwise.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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