

## **Anxiety and Efficacy in Computer Technology Integration among Secondary School Teachers of Angadanan, Isabela, Philippines**

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### **ABSTRACT**

Globally, computer technology is changing the way educators teach and students learn. Faculty must be computer literate, competent to use available technologies and to become innovative and receptive to change. This study aimed to know the levels of computer anxiety and self-efficacy, use of computer applications in instructions and levels of computer anxiety explained by computer self-efficacy, computer usage and selected characteristics. Findings show the total composite anxiety score of 29.36 which is interpreted as Low Technophobia, Generally, Relax or Comfortable. Among the identified schools, self –efficacy of 96.61 was obtained which was interpreted as very confident. When the variables were grouped, a negative correlation ( $r = -.392$ ) for computer self-efficacy and computer applications ( $r = -.22$ ) were noted with the composite computer anxiety scores. These two variables had inverse linear relationships with computer anxiety but had a positive linear relationship with each other. The results revealed that groups' having less self-efficacy have less enthusiasm to perform activities compared to groups having higher self-efficacy. Other findings shown that there are number of teachers whose responses are "not available" and only few hands are utilizing the benefit of using computer applications in their profession. It is recommended that schools should be more open to teachers in using computers and to provide comprehensive training to enhance their literacy and skills in computer application. For this effort, educators could use higher technology and the possibility to develop new instructional methods and materials in their teaching.

**Keywords:** Computer Anxiety, Descriptive design, Self-Efficacy, Computer Technology

### **1.0 INTRODUCTION**

The advent of technology and information systems and their importance in economic development has caused nations to create a more technologically literate workforce. As a nation, the Philippines has embarked on various information technology projects that will keep it abreast with the information era. In paper (Abdul Hamid, 1993) Malaysia plans a more widespread use of computers and related information and communications technology in educational areas to ensure that graduating students are proficient in the use of such technology.

In recent years, there have been calls for changes in the education curriculum to improve the quality of education to sufficiently train students to adapt to the workplace (Abdul Hamid, 1993) especially with jobs that involve the use of computer technology. Educators who use technology in their classes help students to both develop technical literacy and master accounting content. Technically, teachers should be able to communicate with their colleagues and experts in their field and should be able to accomplish similar tasks with other professionals, as well as with their students, and be able to identify and use new instructional methods and resources in their instruction.

Hence, the education provided to students while they are in college should have some amount of practical usage, especially in the area of computer literacy. All of these led to the evolution of the teaching process that has begun integrating technology into the educational curriculum to provide students with meaningful activities.

This advancement can be a critical component to the educational experience, opening more opportunities for learners and educators, thus providing a skilled workforce for the nation's economic development. These developments and challenges have serious implications for the Secondary School Teachers. The faculty is expected to teach using technology as well as the traditional face-to-face approach. The faculty must also be computer literate and competent enough to use those technologies that are available and to become innovative and receptive to change by knowing the strengths and the limitations of the technological tools available.

The study aimed to determine the computer anxiety and computer self-efficacy among Secondary School Teachers in Angadanan, Isabela for School year 2015-2016. Specifically, it aims to:

1. Determine the profile of the respondents in terms of:
  - a. gender
  - b. age
  - c. academic rank
  - d. educational attainment
  - e. years of teaching
  - f. computer training
  - g. years of computer use in instruction
2. Determine the levels of computer anxiety, computer self-efficacy and the extent how faculty use computer applications in their instruction.
3. To what extent can faculty levels of computer anxiety be explained by computer self-efficacy, computer applications usage, and selected characteristics (gender, age, academic rank, levels of education, teaching experience, formal computer training, years of computer use in predicting computer anxiety?)

## **2.0 LITERATURE REVIEW**

### **A. Computer Anxiety**

There are many definitions of computer anxiety, and researchers have not agreed upon a standardized one. (Oetting, 1983) Stated that computer anxiety is a concept-specific anxiety because it is a feeling that is associated with a specific situation, in this case when a person interacts with computers. He elaborated by saying that computer anxiety is "the anxiety that people feel they will experience when they are interacting with computers--the anxiety associated with the concept of computers" (Herdman, 1983) defined computer anxiety as emotional fear, apprehension, and phobia felt by individuals towards interactions with computers or when they think about using computers. (Cambre and Cook, 1985) stated that computer anxiety is a form of state anxiety, and it was brought on in part by the rapidly changing nature of new technology and the subsequent pressure for social change in modern time

### **B. Measuring Computer Anxiety**

There are many researchers who have developed scales to measure computer anxiety. Studies have focused on the various factors involved in this phenomenon such as gender,

computer experience, parental and peer influences, self-efficacy. Maurer and Simonson (1984) Designed the Computer Anxiety Index (CAIN) that uses a 26-item Likert-like scale that measures participants' anxiety toward computers by examining avoidance, negative attitudes, anxiety, and computer comfort. The Computer Anxiety Rating Scale (CARS) developed by (Heinssen, Glass and Knight, 1987) has been cited in many studies. This scale, a self-report inventory designed to assess individuals' levels of computer anxiety with a 19-item questionnaire, is based on a five-point Likert scale.

#### C. Computer Self Efficacy

Adapted from the self-efficacy concept, computer self-efficacy is the extent of an individual's perceived ability to use a computer. Delcourt and Kinzie (1993) Defined computer self-efficacy as a measure of how confident computer users are with their ability to understand, use, and apply computer knowledge and skills. The authors found that individuals who have high computer self-efficacy will feel competent in using different computer hardware and software.

#### D. Measuring Computer Self Efficacy

Similar to the computer anxiety scale, many instruments have been developed to measure computer self-efficacy. Several computer self-efficacy measures were found in the literature, but no single measure is universally accepted. Durndell, Haag and Laithwaite (2000) adopted a computer self-efficacy instrument that had been modified by Torkzadeh and Koufteros (1994) and made further changes to it in their study. The development of computer self-efficacy can be related to anxiety, whereby the lack of knowledge about computers can create a psychological fear (Gardner, Render and Ross, 1985).

### **3.0 METHODOLOGY**

#### **3.1 Statistical Tool**

Statistical frequency and percentages were used to analyze the data for the profiling of respondents. To determine the levels of computer anxiety by school, consider the total composite computer anxiety scores. The individual scores were computed using the 18 questions with the four-point Likert scale. All positive questions (8 items) were reverse scored so that the higher scores, the higher the level of computer anxiety. The individual possible total composite scores may range from 18 (indicating a low level of computer anxiety) to 72 (indicating a high level of computer anxiety).

As for the levels of computer self-efficacy, the possible total composite CSE scores ranged from 29 to 116 using all 29 questions with a four-point rating scale (1=strongly disagree to 4=strongly agree). The levels of confidence was categorized to 4 (a) scores between 29-50 were categorized as not confident, (b) 51-72 as little confidence, (c) 73-94 as confident, and (d) 95-116 as very confident on the computer self-efficacy scale. High scores indicate respondents' high levels of self-efficacy in using computers and vice-versa. Descriptive statistics were used to describe respondents on per school basis.

Descriptive statistics using mean was used to analyze the extent of computer application for instruction. The results were compared among the Secondary Schools of Angadanan, Isabela.

Pearson's product-moment correlation coefficient ( $r$ ) was used to measure how well a linear equation relates between computer anxiety, computer self-efficacy, computer applications usage, and other selected characteristics.

### **3.2 Instrument used and validity**

An 18 statements for objective 2 was used to measure faculty computer anxiety. A modified version of the Computer Anxiety Rating Scale (CARS) developed by (Oetting, 1983) made by Graham (1993) was used for this research. All positively worded CARS response items (8 items) were reversed prior to analysis so that higher scores on all items indicated a higher level of anxiety. The computer self-efficacy scale was patterned from the 29-item section based on Durndell, Haag and Laithwaite (2000) research with slight modifications. For this study, a modified version Computer Resource Usage Scale by Miller (1997) was used with statistical mean to describe the condition of the respondents. (Graham, 1993) the overall reliability coefficient of the instrument was .83 on the final study data with Cranach's alpha coefficients on computer anxiety, computer self-efficacy, and computer applications usage were .78, .95, and .78 respectively. This suggests that the survey instruments used in the pilot study were reliable for measuring levels of computer anxiety, computer self-efficacy and computer applications usage.

### **4.0 RESULT**

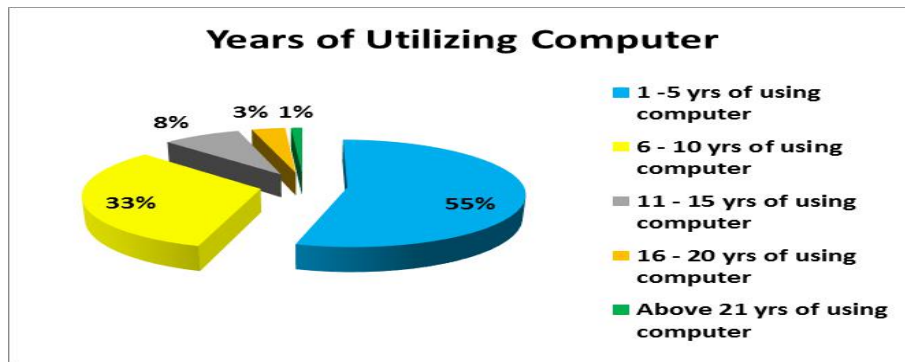
Majority of respondents were female teachers and most of them were from the Angadanan High School. Most of them had finished Bachelor's Degree courses with different line of specialization like in Mathematics, Science, English, Filipino and Technology Livelihood Education.

Figure 1 reveals that as to Computer Training, almost all of the respondents learned and trained by using computers at their own initiative. It is reflected on school basis that 100 percent from Cadaloria National Highschool, Duruc Integrated School, Ingud Ramona and Sto Nino Integrated Schools claimed that they learned to use computers on their own. A percentage of 66% of computer training by self-taught and 34 percent of the respondents underwent formal training in using computers.



**Figure 1.** Percentage Distribution of Respondents as to Computer Training

It can be deduced from Figure 2 that more than half of the teachers with a percentage of 55 admitted of using the computer up to five years, followed by 33 percent of using the unit on the bracket of 6 – 10 years. 1 percent at least, admitted of having use the computer for more than 21 years.



**Figure 2.** Percentage Distribution of Respondents as to Years of computer use in instruction

The results from Table 1 shows that the researchers obtained the total composite anxiety score on the identified schools. Fugaru teachers obtained the lowest total anxiety score. This is followed by Cumu and Villa Domingo teachers (both 27), then the group of Lomboy and Sto. Domingo (both 28). All of these schools are classified to have a "very relax" or having no fear of responding using computers. The rest of the schools had generally relaxed/comfortable teachers when subjected to computer anxiety activities.

For the self –efficacy results among the secondary schools in Angadanan, Isabela, 72.72 per cent of the total schools were classified to have " very confident" to fulfill computer related tasks. Duruc, Lomboy, and Rang-Ayan school teachers are "confident" enough for the challenge in using computer machines. None among the schools fell on categories of having no confidence or little confidence.

The researchers obtained the total composite anxiety score on the identified schools. Its mean score is 29.36 which is interpreted as Low Technophobia, Generally Relax or Comfortable. For the self –efficacy results among the secondary schools in Angadanan, Isabela, 96.61 is the mean this is interpreted as very confident. None among the schools fell on categories of having no confidence or little confidence.

**Table 1.** Computer Anxiety and Self-efficacy results among the secondary schools in Angadanan, Isabela

School	Computer Anxiety		Computer Self Efficacy	
	Rating	Remark	Rating	Remark
<u>Duruc Integrated School</u>	29	Generally Relax, Low Technophobia	91.00	Confident
<u>Cumu Integrated School</u>	27	Very Relax, No Technophobia	107.80	Very Confident
<u>Cadalaria National School</u>	30	Generally Relax, Low Technophobia	96.40	Very Confident
<u>Lomboy Integrated School</u>	28	Very Relax, No Technophobia	92.11	Confident
<u>La Suerte Integrated School</u>	33	Generally Relax, Low Technophobia	95.43	Very Confident
<u>Fugaru Integrated School</u>	25	Very Relax, No Technophobia	97.87	Very Confident
<u>Ingud- Ramona Integrated School</u>	29	Generally Relax, Low Technophobia	99.40	Very Confident
<u>Villa Domingo Integrated School</u>	27	Very Relax, No Technophobia	99.14	Very Confident
<u>Sto Nino Integrated School</u>	28	Very Relax, No Technophobia	95.10	Very Confident
<u>AngadananHighschool</u>	34	Generally Relax, Low Technophobia	96.38	Very Confident
<u>Rang-ayan Integrated School</u>	33	Generally Relax, Low Technophobia	92.13	Confident

The faculty members were asked to select 10 computer applications from the five point Likert scale (0= not available, 1 = never to 4 = always). The most frequent computer application used was word processing with a mean score of 3.02 as shown at table above. This was followed by the use of spreadsheet, internet, and presentation software. The two computer applications that have least usage were the database and programming with mean scores of 1.61 and 1.71.

**Table 2.** Computer Usage Results among the secondary schools in Angadanan, Isabela

Computer Usage	Word processing (e.g. Microsoft Word, Word Perfect)	Spreadsheets (e.g. Excel, Lotus 1-2-3)	Database (e.g. Access)	Presentation software (e.g. PowerPoint)	Simulations (e.g. models a specific environment situation)	Photo editing software (e.g. Adobe, Paint)	Musik Downloading	Programming	Electronic mail	Internet browsing
Durac Integrated School	3.60	3.20	2.60	2.60	2.20	2.20	2.60	2.60	2.00	2.20
Cumu Integrated School	3.20	3.00	2.00	2.80	2.60	2.60	2.40	2.20	2.00	2.80
Cadaloria National School	3.20	2.80	1.40	2.20	1.40	2.00	2.20	1.60	2.60	2.40
Lombay Integrated School	3.00	2.56	2.22	2.56	2.56	2.56	2.78	2.00	3.00	3.11
La Suerte Integrated School	3.00	2.00	1.29	1.71	1.57	1.86	2.71	2.29	1.71	2.29
Fugaru Integrated School	2.67	1.67	1.17	2.00	1.50	0.83	1.83	1.50	1.50	1.67
Ingud-Integrated School Ramona	3.00	2.20	1.60	2.00	2.00	1.60	1.20	1.40	1.20	1.60
Villa Domingo Integrated School	3.00	2.14	1.00	2.57	1.57	1.43	2.00	1.14	1.00	1.86
Sto. Nino Integrated School	3.13	1.88	1.00	1.75	1.50	1.38	1.88	1.38	1.63	2.63
Angadanan Highschool	3.00	2.52	1.95	2.24	1.86	2.19	1.81	1.33	1.71	2.81
Rang-ayan Integrated School	2.38	2.13	1.50	1.50	1.38	1.13	1.63	1.38	1.38	1.75
AVERAGE	3.02	2.37	1.61	2.18	1.83	1.80	2.09	1.71	1.79	2.28

The findings in Table 2 clearly depicts the working environment of secondary teachers using computer. Word processing which is usually needed for reports and communication are common activities of teachers, likewise, spreadsheets are used for computation of students grades, while internet and presentation software's are used in preparing and teaching lessons. The least among these applications are databases and programming which are not popular for high school curriculum.

This supports the research (Graham, 1993; Bandura, 1997; Juette and Zeffanella, 1990) concerning the importance of using computer applications software. In support for the progress of using computer machines, the finding of this study showed a little higher mean usage for computer applications (Bandura, 1997), who reported the following means on a 4.0 scale: Internet, mean= 1.9; electronic mail, mean= 2.2; spreadsheet, mean= 2.2; and presentation software, mean= 2.1. The difference with the study may have been due to the period Miller conducted the study were use of this technology is not quite popular as to these days.

The relationships between independent variables in this study are presented in Tables 4 .The total composite computer self-efficacy scores have a negative correlation ( $r = -.392$ ), and computer applications usage also has a low negative correlation ( $r = -.22$ ) as correlated

with total composite computer anxiety scores. These two variables had inverse linear relationships with computer anxiety and a positive linear relationship with each other.

**Table 3.** Correlation Table among The Variables

Variables	Computer Anxiety	Computer Self Efficacy	Computer Application Usage
Computer Anxiety	1	-.392	-.220
Computer Self Efficacy		1	.362
Computer Application Usage			1

The results from Tables 3 support the study of (Miller,1997 ; Graham, 1993) that there was an inverse linear relations between computer anxiety with computer self-efficacy and computer application usage. The results further support the findings of Embi (2007) who concluded that persons with high computer self-efficacy have less anxious than persons having low computer self-efficacy. Furthermore, the person with higher computer self-efficacy has more likely use computer applications in general. This findings is coherent with the findings of Bandura (1997) that groups having less self-efficacy have less enthusiasm to perform activities compared to groups having higher self-efficacy.

## 5.0 CONCLUSION

When the teacher-respondents were grouped according to their school assignment, they have no to low anxiety levels. It means that they were very comfortable and don't experience computer anxieties when tasks related to computers are done. Likewise, in their computer self-efficacy results, they have a very positive outlook to always accomplish a work using computer machines.

Applications such as word processing, spreadsheet, internet browsing and presentation were among the most used by the respondents in their teaching profession. However, not the majority of them use these applications. As revealed from the data, the frequency of usage for the computer applications for instructions is quite not enough. The overall mean for the computer application usage is "sometimes" or just below average.

Based on the results, neither gender nor age of respondents have the effect on the computer anxiety, computer self- efficacy and computer usage of the Angadanan high school teachers. Not even the academic rank, educational attainment and years in teaching have direct relations with the three previously enumerated variables. However, when they are compared with one another, there exist inverse relationships. The self-efficacy serves as an important factor in determining the levels of computer anxiety and computer usage either for personal, office or instruction purposes. This finding supports the study of Embi (2007) who concluded that persons with high levels of computer self-efficacy have high confidence and are less anxious as compared to a person with low computer self-efficacy.

While computers are visible among the public high schools of Angadanan, Isabela, there is a clear gap about the computer application usage status of individual respondents. The data



revealed that there are number of teachers whose response are "not available" and only few hands are utilizing the benefit of using computer applications in their profession. Therefore it is recommended that schools should be more open to their teachers in using computers and to provide comprehensive training to enhance their literacy and skills in computer application. For this effort, educators could be able to use higher technology and the possibility to develop new instructional methods and materials in their teaching profession

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