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Research Article

### Attitudes in Relation to Perceived Competence, Frequency of Access, and Number of Trainings in Information and Communication Technology

<sup>1</sup>Agnes P. Mercado and <sup>2</sup>Glenn M. Calaguas

<sup>1</sup>San Pablo Elementary School, Sta. Ana, Pampanga, Philippines

<sup>2</sup>College of Education, Pampanga State Agricultural University, Pampanga, Philippines

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#### ABSTRACT

This study focused on the relationship of attitudes to perceived competence, frequency of access, and number of trainings in Information and Communication Technology (ICT) among teachers. To achieve the purpose of the study, the descriptive-correlation design was used. One hundred fifty-two public school teachers from the 12 schools of the District of Sta. Ana, Pampanga in the Philippines served as respondents of the study. Data revealed that the respondents had positive attitude towards ICT, had perceived fair competence in ICT, had daily access to ICT, and 37.43% of them had no trainings in ICT. Statistical analyses further revealed that significant positive correlations exist between positive attitude and perceived competence and number of ICT trainings while no significant correlation exist between positive attitude and frequency of access. Additionally, significant negative correlation exist between negative attitude and perceived competence, frequency of access, and number ICT trainings.

*Keywords: attitudes; frequency of access, information and communication technology; perceived competence; public school teachers.*

#### INTRODUCTION

Information and Communication Technology (ICT) in the classroom is important. It plays a traditional role like that of a delivery vehicle for instructional lessons or in a constructivist way, a partner in the learning process. Focusing on the learner, ICT helps in building more meaningful interpretations of life and the world in general. It makes the learner gather, think, analyze, synthesize information and construct meanings with what technology presents [19]. ICT in particular, focuses on the integration of telecommunications, computers as well as necessary enterprise software, middleware, storage, and audio-visual systems which will enable users to store, transmit, and manipulate information [21].

In the Philippines, the 2002 Revised Basic Education Curriculum (RBEC) is a curricular change by the Department of Education (DepEd) that recognized ICT skills to be of paramount importance in alleviating poverty and in achieving competitive advantage in the global economic arena. One of its salient features is the inclusion of basic learning competencies in computer skills in both elementary and secondary education [14]. As a manifestation of further recognition of the importance of ICT, it was discussed in the Second Asia Pacific Ministerial Forum on ICT Education (AMFIE) held in Manila and participated in by leaders and dignitaries from 16 countries in the Asia-Pacific Region. Problems in the education sector and how such problems could be addressed with ICT integration on a collaborative approach were given focus. DepEd Secretary Luistro

stressed that computerization of classrooms is as basic as infrastructure [32].

Similarly, the Basic Education Coalition (n.d.) reiterated that ICT is of paramount importance to the future of education and has identified the training of teachers in ICT as an education initiative that can successfully contribute to meeting the goals of Education for All (EFA). Specifically, focus on the following areas need to be done to successfully contribute to meeting the EFA and the Millennium Development Goals: (1) increasing access through distance learning, (2) enabling a knowledge network for students, (3) training of teachers, broadening the availability of quality educational materials, and (4) enhancing the efficiency and effectiveness of educational administration and policy.

Aside from the actual use of ICT in classrooms, it must be noted that ICT also plays a big role in the keeping of records. A lot of programs and data reporting procedures are done through the use of computers from which teachers themselves do the job. One example of which is the DepEd Order No. 22 Series of 2012 stating the inclusion of Learner's Reference Number (LRN) in the data of students' records. These LRNs can be retrieved in the DepEd website.

It must be noted that the use of technology in the classroom has never been so relevant than now. As emphasized by Groff and Mouza, the goal of every teacher is to create classroom environments where technology can be used to achieve the goals of education. However, as Bilbao, Corpuz, Llagas and Salandanan [19] claimed, survey data still suggest that technology remains poorly integrated in schools despite massive acquisition of hardware.

#### *Literature Review:*

##### *Attitude towards ICT:*

Attitude can be defined as the expression of favor or disfavor toward a person, place, thing, or event [4]. Focusing on the attitude towards ICT, positive attitude towards technology can be helpful in the effective integration of ICT in the classroom [28]. Similarly, Abu Samak, with reference to Jordanian public schools, found that one of the many factors that contributed to the fast adoption of ICT in classrooms was that of teachers' positive attitude.

As evident in the review of existing literature by Buabeng-Andoh [11], attitude of teachers toward technology and the actual intention to make use of technology are important. Even though excellent facilities are available, with negative attitudes, teachers will still not use them in their teaching. It is but necessary therefore to assure teachers that technology is an aid to make teaching interesting, easier, motivating, and enjoyable to them and their students as well.

##### *ICT Competence:*

The educational thrust of the 21<sup>st</sup> century is global education and the chief concern of a school is to develop an attitude among the youth that will

foster the creation of a world community. Teachers are in a strategic position to help the youth develop and cultivate the value of world-mindedness and social competence [23]. Tan, stressed key areas of competency necessary for teachers' work include specific knowledge, skills, and attitude.

One of the competencies that can be looked into among teachers is their competence in ICT. Competence can be defined as the ability of an individual to do a job properly while competency is a set of defined behaviors that provide a structured guide enabling the identification, evaluation, and development of the behaviors in individual employees [18]. Additionally, competencies can pertain to measurable or observable knowledge, skills, abilities and behaviors that are critical to successful job performance [35].

With the technological advances and the new arrangements necessary to accommodate them in the school system, teachers are therefore required to assume new roles and insights in order for them to be fully equipped and skilled in the profession [19].

##### *Attitude and ICT Competence:*

ICT is one of the major aspects in a teacher's work thus the attitude towards it might be a contributing factor in developing competence. Achieving meaningful use of technology in the field of education can be influenced by many factors. One of these factors is teachers' attitudes toward the use of technology in the teaching learning process. As highlighted by Alrasheedi [3], the attitudes of teachers plus their willingness to incorporate ICT in their classrooms are important determinants of ICT implementation.

Specifically, Sabates and Capdevila believe that attitude focuses on the predisposition to an act while competence focuses on the actual execution of the behavior. The manifestation of attitude, and probably of competence, as well as its assessment in action in turn influences the same elements that helped it to emerge. This aspect explains how execution is transformed into routines or behaviors and how these can reshape ideas, skills, and habits. Such can impact emotions, going so far as to generate new attitudes that can involve predisposition to new behaviors, and that help acquire and develop new competencies, through learning in action.

In the end, it must be remembered that the introduction of ICT in education has completely changed the conventional way of the teaching and learning process. But in order to make the best use of available resources, it is but essential that all those engaged in the educational enterprise, including teachers, should understand adequately the dynamics and mechanism of ICT.

#### *2. Objectives:*

This study generally aimed to determine the possible relationship of attitudes to perceived

competence, frequency of access, and numbers of trainings in ICT.

## MATERIALS AND METHODS

### 3.1 Research Design:

The study utilized the descriptive-correlational research design. Banyard and Grayson [7] define correlational research as a type of study that is designed to measure and describe the relationship between variables without attempting to explain the cause of the relationship. The variables analyzed in this study were attitudes, perceived competence, frequency of access, and number of trainings.

### 3.2 Respondents:

The respondents of the study were teachers from all the elementary schools, a total of 12 schools, in Sta. Ana District, Pampanga in the Philippines. A total of 152 teachers served as respondents in the study. There were 148 female and four male respondents.

### 3.3 Research Instruments:

An attitudes scale based on the standards set by the National ICT Competency Standards (NICS) and a competence scale based on the National Competency-Based Teacher Standards-Teacher Strengths and Needs Assessment (NCBTS-TSNA) were used in the study. The NCBTS-TSNA is one of the bases of the DepEd for measuring teachers' competency among public schools in the Philippines. Questions as to their frequency of access and actual number of trainings in ICT were also raised during the conduct of the study.

### 4. Results:

Table 1a and 1b shows the respondents' attitudes toward ICT, Table 2 shows the respondents' perceived competence in ICT, Table 3 shows respondents' frequency of access, Table 4 shows respondents' number of ICT Trainings, Table 5a and 5b shows the relationship between respondents' attitudes and perceived competence, Table 6a and 6b shows the relationship between respondents' attitudes and frequency of access, and Table 7a and 7b shows the relationship between attitudes and number of trainings.

**Table 1a:** Positive Attitude towards ICT.

Statements	N	Min.	Max.	SD	M	Interpretation
1. I appreciate ICT, it is useful in improving teachers' efficiency.	152	1.00	4.00	.64	3.51	Strongly Agree
2. I certainly regard teaching-learning to be more interesting if computer technology will be used.	152	1.00	4.00	.61	3.28	Agree
3. I prefer to use computer database to make my work easier and faster.	152	1.00	4.00	.61	3.18	Agree
4. I acknowledge ICT as a useful tool in getting additional information.	152	1.00	4.00	.58	3.49	Agree
5. I see computer as a useful tool in enhancing learning.	152	3.00	4.00	.50	3.49	Agree
6. I find it easier and faster computing grades and preparing reports with the use of computers.	152	1.00	4.00	.61	3.48	Agree
7. I acknowledge Wi-Fi's, LCD, and laptops as useful tools in teaching.	152	2.00	4.00	.58	3.29	Agree
8. I consider ICT integration as a must in the curriculum.	152	1.00	4.00	.62	3.10	Agree

Table 1a displays the respondents' positive attitudes toward ICT. For the purpose of expedient interpretation, total mean score ranging from 3.5 to 4 was interpreted as Strongly Agree, 2.5 to 3.49 as Agree, 1.5 to 2.49 as disagree, and 1.0 to 1.49 as Strongly Disagree. As can be seen in the Table, the respondents agreed with the eight positive indicators with one statement reflecting strong agreement (I appreciate ICT, it is useful in improving teachers' efficiency). It can be assumed therefore that they have positive attitudes toward ICT. Specifically, the items with the highest means are: I acknowledge ICT as a useful tool in getting additional information (M=3.46), I appreciate, it is useful in improving teachers' efficiency (M=3.45), and I see computer as a useful tool in enhancing learning (M=3.43).

Table 1b displays the respondents' negative attitudes toward ICT. For the purpose of expedient interpretation, total mean score ranging from 3.5 to 4 was interpreted as Strongly Agree, 2.5 to 3.49 as Agree, 1.5 to 2.49 as disagree, and 1.0 to 1.49 as

Strongly Disagree. Results imply that the teachers disagreed with the eight negative statements about ICT. The following items had the lowest means: I avoid computers and the internet (M=1.68), I feel that computers and other ICT gadgets are expensive but not worthy tools for quality learning (M=1.84), and I feel nervous when using the computer and the web (M=1.9).

It can be inferred that respondents of this study agreed on the importance of technology in teaching and in the uplifting of self-confidence. The findings of this study were parallel with earlier studies conducted. Mahmud and Ismail found that the respondents of their study were very positive with the use of ICT in the classroom and recognized its importance while Rana found that almost all teacher-respondents had positive attitude toward ICT and were more than willing to use technology in their classes in Northern India. Similarly, Albirini [2] found through quantitative and qualitative data that teachers had positive attitude towards ICT in Syria.

This is similar with the findings of Al-Zaydiyeen, Mei and Fook [3] where teacher-respondents hold positive attitude towards the use of ICT in Jordan. Sa'ari, Luan and Roslan [29] also found that teachers had positive attitude toward new technologies in Melaka, Malaysia. Teachers considered technologies to be useful and had greater confidence, lower levels

of anxiety, and aversion in using computer than using the traditional way of teaching. In the same light, the study of Cajilig found that teachers were very willing to implement ICT integration in their own teaching to improve the quality of learning in Manila, Philippines.

**Table 1b:** Negative Attitude towards ICT.

Statements	N	Min.	Max.	SD	M	Interpretation
1. I avoid computers and the internet.	152	1.00	4.00	.73	1.65	Disagree
2. I feel nervous when using the computer and the web.	152	1.00	4.00	.73	1.95	Disagree
3. I feel that computers and other ICT gadgets are expensive but not worthy tools for quality learning.	152	1.00	4.00	.72	1.82	Disagree
4. I can teach without a computer so I don't need it.	152	1.00	4.00	.75	2.49	Disagree
5. I find it difficult to learn ICT specially in making instructional materials and reports.	152	1.00	4.00	.74	2.13	Disagree
6. I have no time to learn ICT for education.	152	1.00	4.00	.70	1.98	Disagree
7. I find basic skills in computer difficult to learn.	152	1.00	4.00	.81	2.22	Disagree
8. I don't regard computer technology in the improvement of the quality of learning.	152	1.00	4.00	.74	2.02	Disagree

**Table 2:** Perceived Competence in ICT.

Statements	N	Min.	Max.	SD	M	Interpretation
1. I know the nature and operations of ICT systems as they apply to teaching and learning.	152	1.00	4.00	.88	2.28	Fair
2. I can use ICT tools on assessment and evaluation of data and report results.	152	1.00	4.00	.98	2.27	Fair
3. I can use a word processor to enter and edit text and images.	152	1.00	4.00	1.01	2.47	Fair
4. I can print, store and retrieve text documents from a word processor.	152	1.00	4.00	1.04	2.44	Fair
5. I can use powerpoint presentation in making instructional materials.	152	1.00	4.00	1.07	2.06	Fair
6. I can organize and manage computer files, directories and folders.	152	1.00	4.00	1.06	2.22	Fair
7. I can use the Adobe Reader, Google and other websites.	152	1.00	4.00	1.02	2.38	Fair
8. I can properly connect main components, configure peripherals and install drivers when required.	152	1.00	4.00	.89	1.88	Fair
9. I can send, open emails with attachments.	152	1.00	4.00	1.06	2.28	Fair
10. I can use the internet in searching pictures, written information, videos and others for the lesson.	152	1.00	4.00	1.07	2.62	Satisfactory
11. I can use the LC and Interactive Whiteboard in teaching.	152	1.00	4.00	.83	1.82	Fair
12. I can stitch together video footages and sound tracks and add simple enhancements, transitions, titles and others.	152	1.00	4.00	.85	1.76	Fair
13. I can store files using CD, DVD and flash drive.	152	1.00	4.00	1.06	2.12	Fair
14. I can verify data from the web, especially on DepEd's site.	152	1.00	4.00	.96	2.09	Fair
15. I can create/use an internet account for data gathering regarding important files of pupils, lesson plans and other instructional materials.	152	1.00	4.00	.96	2.09	Fair

Table 2 reflects the respondents' perceived competence in ICT. For expedient interpretation, the following parameters from the NICS and NCBTS-TSNA tools were used: 4- High (Expert), 3- Satisfactory (Experienced), 2- Fair (Developing) and 1- Low (Beginning). Generally, as revealed in the data, the perceived competence of the respondents was fair. This is reflected in the grand mean of 2.14. Of the 15 identified competencies, only item no. 10: "I can use the internet in searching pictures, written information, videos and others for the lesson" received a perceived satisfactory competence (M=2.54).

Several studies also documented the competence of teachers in ICT. Almekhlafi and Almeqdadi found that teachers at UAE Model Schools had high perception of their abilities and competencies in integrating technology to their teaching. Also, Cavas, Cavas, Karaoglan and Kisla [16] found that approximately 80% of their Science teacher-respondents had at least 1-3 years of experience in using computers in their teaching in Turkey while Jegede, Dibu-Orijende and Ilori found that teachers perceive computers to be useful in their pedagogical enterprise, their interest was aroused which in turn helped their computer skills in Nigeria. Abu Samak

found that computer competency is a factor in the fast adoption of ICT in the classroom in Jordan.

On the other hand, Tinio found that only 10% or less of teachers can email or do online researches and

on 20% of the schools, not a single teacher had basic internet skills in Manila, Philippines. In relation, Abu Samak found that teachers had low levels competence in ICT in Jordan.

**Table 3:** Frequency of Access to ICT.

	N	Min.	Max.	SD	M	Interpretation
1. At home	152	1.00	4.00	.93	2.44	Daily
2. In school	152	1.00	4.00	1.34	2.36	Daily
3. Relative's computer	152	1.00	4.00	1.22	1.94	Daily
4. Internet Café	152	1.00	4.00	1.34	2.15	Daily
5. Cellular phone	152	1.00	4.00	.85	2.11	Daily

Table 3 presents the respondents' frequency of access. The Table shows that the respondents had a daily access as revealed by the grand mean of 2.13. The respondents used computers in their homes, in school, relative's computer, and internet café or through cellular phones. The present study showed that respondents had daily access to computers in different settings.

From this, it can be noted that access to computers nowadays is readily-available, so it is easy for the respondents to hone their ICT skills.

Computer access was found to be the strongest determinant of computer skills as revealed in the study conducted by Buabeng-Andoh and Totimeh. Abu Samak [1] claimed that computer access is an important factor to be considered to ensure fast adoption of technology in classrooms.

In contrast to the present study, Al-Zaydiyeen *et al.* found that their teacher-respondents had low level of ICT use specifically for educational purposes while Abu Samak found that teachers-respondents in his study had low access to ICT.

**Table 4:** Number of Trainings in ICT.

Number of Trainings	Frequency	Percentage
5	6	3.51
4	5	2.92
3	7	4.09
2	28	16.37
1	61	35.67
No Training	64	37.43
Total	171	100.00

The respondents' ICT training is reflected in Table 4. As can be seen in the Table, not everyone had ICT training. As a matter of fact, 37.43 percent of the respondents do not have any training in ICT. This finding does not jive with the importance of training teachers in ICT as an education initiative claimed by the Basic Education Coalition (n.d.).

Taking into consideration the rapid development in the field of technology and its importance in the field of education, teachers should be provided with regular trainings [13]. Similarly, Almekhlafi and Almeqdadi suggested that in order to facilitate technology integration, regular professional development workshops should be conducted.

As emphasized by Mahmud and Ismail, it does not necessarily follow that having high-end technology in schools mean teachers are more than willing to use them. It is still necessary for teachers to be provided with necessary ICT skills and competencies for them to be better facilitators and designers of students' learning. BECTA assumed that inadequate training is tantamount to insufficient

preparation for teachers and will result to the lack of confidence among them. Lack of training can be considered a barrier to teacher's ICT use. However, Sabzian and Gilakjani suggested that training for teachers should not only be limited to actual computer use but more importantly on how technology can be used to improve the quality and effectiveness of instruction.

Kiper and Tercan concluded in their study that half of those teachers satisfied with in-service trainings always use CT in their classes, and half of teachers dissatisfied with in-service trainings never use ICT in their classes. Abu Samak [1] also found that intensive in-service trainings was one of the factors associated with the fast adoption of ICT in the classroom. Generally, it is believed that technological training is an important factor for a teacher to adopt ICT in the classroom. In must be noted though that lack of training is not a hindrance for teachers of United Arab Emirates model schools to integrate technology in the classroom.

**Table 5a:** Positive Attitude and Perceived Competence.

	N	M	SD	r
Positive attitude	152	26.82	3.04	.42**
Perceived competence	152	32.77	12.91	

\*\*significant at 0.01 level.

Table 5a presents the relationship of the respondents' positive attitude and perceived competence in ICT. As can be seen in the Table,

there is a positive and significant relationship between the two variables.

**Table 5b:** Negative Attitude and Perceived Competence.

	N	M	SD	R
Negative attitude	152	16.28	3.57	-.57**
Perceived competence	152	32.77	12.91	

\*\*significant at 0.01 level.

Table 5b presents the relationship of the respondents' negative attitude and perceived competence in ICT. As can be seen in the Table, there is a negative and significant relationship between the two variables.

they can easily have useful insights that can contribute to the integration of ICT in the teaching and learning process.

Teachers are considered change agents in school. Teachers are the key drivers in incorporating technology in the classroom thus it is important that teachers have positive attitude towards technology since attitude can be linked to usage and intention to use. Buabeng-Andoh [12] assumed that when teachers have positive attitudes towards technology,

Generally, it is paramount that attitude and perceived competence be compared. Studies conducted by Censon, Sa'ari, Luan and Roslan, Al-Zaidiyeen *et al.* and Jegede *et al.* are parallel with the present study. Findings from these studies indicate that positive attitude is positively correlated with teachers' ICT competence and negative attitude is negatively correlated with teachers' ICT competence.

**Table 6a:** Positive Attitude and Frequency of Access.

	N	M	SD	r
Positive attitude	152	26.82	3.04	.13
Frequency of access	152	10.99	3.61	

Table 6a shows the relationship between the respondents' positive attitude and the frequency of their access to computers. Statistical analysis

revealed no significant relationship between respondents' positive attitude and the frequency of their access to computers.

**Table 6b:** Negative Attitude and Frequency of Access.

	N	M	SD	r
Negative attitude	152	16.28	3.57	-.23**
Frequency of access	152	10.99	3.61	

\*\*significant at 0.01 level.

Table 6b shows the relationship between the respondents' negative attitude and the frequency of their access to computers. Statistical analysis revealed negative and significant relationship between respondents' negative attitude and the frequency of their access to computers.

of access still proves the point that attitude is still related to the frequency of access. In line with this, the findings of Al-Zaidiyeen *et al.*, Cajilig, and Cavas *et al.* found significant difference between computer ownership at home with respondents' attitudes. Teachers who own computers had a more positive attitude towards ICT than those who do not. Buabeng-Andoh and Totimeh assumed that the greater the experience of teachers with computers, the more likely that they will have positive attitude.

Although, a significant correlation was not established between positive attitude and frequency of access, still the significant and negative correlation between negative attitude and frequency

**Table 7a:** Positive Attitude and Number of ICT Trainings.

	N	M	SD	R
Positive attitude	152	26.82	3.04	.16*
ICT trainings	152	2.15	1.32	

\*significant at 0.05 level.

Table 7a reflects the relationship between the respondents' positive attitude toward ICT and trainings in ICT. As reflected in the Table, there is a

positive and significant relationship between positive attitude and number of ICT trainings.

**Table 7b:** Negative Attitude and Number of ICT Trainings.

	N	M	SD	R
Negative attitude	152	16.28	3.57	-.27**
ICT trainings	152	2.15	1.32	

\*\*significant at 0.01 level.

Table 7b reflects the relationship between the respondents' negative attitude toward ICT and trainings in ICT. As reflected in the Table, there is a negative and significant relationship between negative attitude and number of ICT trainings.

The studies of Censon , Eborá [20] and Tinio also found that attitude and trainings are related. Moreover, Cajilig [15] expounded that teachers are very willing to implement ICT integration, thus a strong support for this must be given. As found in the study of Mahmud and Ismail [27] formal ICT trainings and ICT experience influences teachers attitude towards ICT. The findings of the present study only proved that the greater ICT trainings that teachers receive, the higher will be their favorable attitudes toward it, in the same way, lesser trainings would mean lesser favorable attitude toward ICT.

In the end, it must be acknowledged that the demands of the modern society represent a unique opportunity for education systems. Schools that have traditionally taught their students to store and recall information from specific content areas must now respond to the challenge of preparing young people for integration and success in societies and economics driven by transformation of knowledge into new ideas and application. Classrooms must serve as places of collaboration and discovery where information and communication serves as a tool for learning (Basic Education Coalition, n.d.). It is high time for educators to be able to use ICT effectively. Educators have to be competent in ICT in order to be on par with students [25].

##### 5. Conclusion:

Basing from the results of this study, it can be concluded that attitude is related to perceived competence, frequency of access, and number of ICT trainings. Schools are therefore encouraged to look into possible ways to improve teachers actual competence in ICT, increase their access and trainings as well. Teachers can also be given information as to the many uses of ICT in teaching. Encouraging the use of ICT will increase familiarization and will lead to empowerment not only in ICT but also in teaching. Technology can be of great aid in improving the teaching and learning process.

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