Improving Level of Teachers' Computer Literacy through Community Extension Program

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Abstract

The necessity for teachers to cope with the current technology has inspired the researchers to assess the level of computer literacy of all Public Secondary teachers of Northeastern Cagayan as a basis to design a computer literacy program to improve their competencies in using ICT in the teaching and learning process. The respondents consisted of 157 teachers from public secondary schools of northeastern Cagayan. Data were collected through questionnaires based on the training needs self-assessment test made by the pool of experts of the College of Information and Computing Sciences of Cagayan State University Gonzaga to measure the computer literacy of the teachers. Results revealed that most of the respondents are moderately skilled and they need more training to enhance their computer skills for they don't have sufficient knowledge to perform all the operations of these applications which are needed in the delivery of instruction. Computer literacy level differed significantly when grouped by age, computer training attended, number of hours of computer usage per week at home and office, years of teaching, and computer applications used in teaching. Results from this study will be a basis for designing the computer literacy training program of the Public Secondary teachers of Northeastern Cagayan. The Computer Literacy training program will be administered to all the respondents as one of the community extension programs of the College of Information and Computing Sciences of Cagayan State University Gonzaga.

Keywords: *Public secondary teachers, extension program, computer literacy, ICT*

I. INTRODUCTION

Nowadays, the computer plays an important role in education. As observed, most of our institutions use a computer not only inside the classroom with computer subjects but also in the different aspects of education. It has benefited from the inclusion of technology and computers by making it easier for students to keep up while helping teachers by improving the way lessons can be planned and taught inside the classroom (Wright, 2018).

For teachers in this era, the need for them to have knowledge on using all the possible capabilities of the computer as their aid for instruction must be given importance since almost our schools now use a computer in the teaching and learning process. While educators use computers differently in their classrooms, the devices provide a number of educational opportunities, including uses in curricular development, research, record-keeping, computer literacy training, data processing, and presentation (Cooper, 2017).

In this connection, the Commission on Information Communications Technology (CICT) of the Philippines sets the National ICT Competency Standards (NICS) for Teachers where competency outcomes, and the supporting knowledge and skills that are needed to utilize ICT in performing the job roles related in teaching (NCC, 2010). To be able to adhere with these standards, teachers must then improve their literacy level in using ICT tools for like all tools, if used properly it can be an asset but if it is used improperly, it can become an obstacle to achieving its intended purpose (Kvavik, 2015).

It is increasingly becoming more and more important that teachers know how to access and apply technology in the classroom. As we evolve into the information age, multiple research studies have indicated that not enough attention has focused on the education of classroom teachers on how to utilize and integrate technology into their curricula (Fisher, 2006). Insufficient technical support at schools and little access to the Internet and ICT were

considered as the major barriers preventing teachers to integrate ICT into the curriculum (Salehi & Salehi, 2012). This integration of technology inside the classroom has not yet fully embraced in the teaching-learning process. With these difficulties and challenges in applying technology in the classroom, some studies revealed that teacher's time to learn computer skills is not the obstacle to implementing the use of technology in the classroom because they have enough time to learn computer skills. It was difficult to use technology in the classroom with the following factors: lack of computers as the major obstacle to using computer-based teaching in the classroom, the absence of access to equipment, and the lack of technical support (Nikian, Nor, & Aziz, 2013).

Integration of ICT in the teaching and learning process is a big challenge to public secondary teachers. The effectiveness of ICT at school depends on the actual practice that teachers make of it and on their ability to integrate ICT into their teaching process. In addition, evidence on which ICT-related teaching methods matter for student achievement. More specifically, computer-based teaching practices increase student performance if they are aimed at increasing students' awareness of ICT use and at improving their navigation critical skills, developing students' ability to distinguish between relevant and irrelevant material and to access, locate, extract, evaluate and organize digital information (Comi, Argentin, Gui, Origo, & Pagani, 2017).

Furthermore, the development of the ICT competency of teachers should have a prominent place in initial teacher training by promoting skills acquisition for ICT use in the classroom and developing positive attitudes towards the value of ICT in teaching. Specifically, educational policies should increase the investment in teacher training, their professional development in ICT and the creation and dissemination of quality educational software for classroom use (Gil-Flores, Rodriguez-Santero, Torres-Gordillo, 2017).

It is for these reasons that teachers need to be a computer literate and acquire enough competencies to be able to confidently used ICT inside the classroom. Thus, the researchers were motivated to determine the computer aptitude and skills of public Secondary Teachers of Northeastern Cagayan as their basis to come up with a literacy program to improve teacher's competencies through the extension program of the College of Information and Computing Sciences of Cagayan State University Gonzaga. Likewise, the result of the study will also be brought to the attention of the Public Secondary School Administrators, the Teacher Education department of the university and to the IT Instructors. This is because the result is viewed to be a basis for redesigning the College of Teacher Education or IT Curriculum.

The researchers strongly believe that the research on the level of computer literacy of the Public Secondary School Teachers of Northeastern Cagayan would benefit not only the teachers, administrators, and students but also the community as a whole. As such, the main goal of the study is to assess the level of computer literacy of Public Secondary teachers of Northeastern Cagayan. It specifically profiles the whereabouts of the research participants, and the way their computer literacy are evaluated. It also aimed to compare the computer competencies of the respondents when grouped according to their profiles.

II. METHODOLOGY

Research Design

To attain the objectives of the study, the researchers used the descriptive with comparative research design. A questionnaire was prepared to assess the computer literacy level of the teachers of the Public Secondary schools of Northeastern Cagayan. The researchers also asked questions to validate the respondents' responses.

Research Locale

The study setting was in the 1st district of Northeastern Cagayan, specifically the national high schools located in the municipalities of Gonzaga, Sta. Teresita, and Sta. Ana.

Of the locales of the study, four schools were from the municipality of Gonzaga, these are Gonzaga National High School, Ipil National High School, Baua National High School, and Rebecca National High School; two were from the municipality of Sta. Teresita, these are Luga National High School and Sta. Teresita National High School, while two of the public secondary

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schools were from the municipality of Sta. Ana, these schools are Casambalangan National High School and Sta. Ana Fishery National High School.

Participants

The sampling technique used in the study is complete enumeration. The respondents of the study had a total of 157 teachers all from the public secondary schools of North-eastern Cagayan of the school year 2014-2015. The data are presented in table 1.

Table 1. Distribution of Respondents According to the Schools they are employed

School Employed In	Number of Respondents
Gonzaga National High School	23
Ipil National High School	14
Baua National High School	22
Rebecca National High School	11
Luga National High School	8
Sta. Teresita National High School	35
Casambalangan National High School	14
Sta. Ana Fishery National High School	30
Total	157

Data Gathering

The researcher first sough the necessary documents for data collection. These include consent letter to the participant, letter to the heads of offices, and assent form. Upon approval, the researchers started the data collection.

To interpret and analyze the data on respondents' assessment of their computer literacy in the areas of general computer operations, word processing, spreadsheets, databases, multimedia presentations, and communication and internet, weighted mean was used.

The scale given below was used in the interpretation of the average weighted mean:

Range of Values	Scale	Verbal Description
2.34 - 3.00	3	Very Skilled, adequate for most tasks
1.67 - 2.33	2	Moderately Skilled, sufficient for a basic task only
1.0-1.66	1	Fairly Skilled, limited ability

To test if there was a significant difference in the computer literacy of the respondents when grouped according to their profile variables, T-test was used for 2 groups and Analysis of Variance (ANOVA) for 3 or more groups at 0.05 margins of error.

Instrumentation

The questionnaire was the principal instrument used in gathering data on the computer literacy of respondents. This has two parts, namely: Part 1 is about the profile of the teachers and Part 2 is about the level of computer literacy self-assessment test of the teachers. The instrument was evaluated by the pool of experts of the College of Information and Computing Sciences of Cagayan State University. It is noted that some of the skills in the instrument were based on the National ICT Competency Standard for teachers particularly on Domain A where Technology Operations and Concepts were evaluated (NICS).

III. RESULTS AND DISCUSSIONS

Assessment of Teacher in Computer Literacy

The level of competencies that were analyzed in this area includes general computer operations, word processing, spreadsheet, database, multimedia presentation, and communication and internet.

The respondents' were very skilled description in the area of general computer operations as shown by their weighted mean of 2.49 (Table 2). However, the respondents were moderately skilled in using a disk clean up tool as shown by their weighted mean of 1.99. The grand mean for General Computer Operation skills is which suggest that the teacher-respondents have adequate skill to perform for most tasks in this category.

The respondents are very skilled in creating, opening and closing the document as shown by their mean of 2.57 (Table 3). However, in the skill of using word wrapping in the document, the respondents are moderately skilled as shown by their mean of 2.02.

The grand mean for word processing skills which is 2.29 suggest that the respondents are "moderately skilled" which means that their skill is sufficient for basic tasks only in this category.

Table 2. Description of Computer Literacy of Respondents in the Area of General Computer Operations

Variable	Mean	Verbal Description
can turn the computer on	2.85	Very skilled
know how to manage my desktop (set up screensavers, create shortcut icon)	2.38	Very skilled
know how to customize my taskbar	2.46	Very skilled
know how to open and switch between applications	2.57	Very skilled
can create new directories/folders	2.42	Very skilled
know how to save files in my own directory and in general directories	2.61	Very skilled
know how to move and copy files/folders	2.51	Very skilled
know how to rename files/folders	2.62	Very skilled
can find previously saved files/folders	2.61	Very skilled
can navigate applications using the mouse	2.41	Very skilled
can use a disk clean-up tool	1.99	Moderately skilled
know how to use the printer and scanner	2.43	Very skilled
can minimize, maximize, and resize windows	2.47	Very skilled
can use Windows Help	2.21	Moderately skilled
know how to shut my PC down properly	2.74	Very skilled
Grand Mean	**2.49**	**Very skilled**

Table 3. Description of Computer Literacy of Respondents in the Area of Word Processing

Variable	Mean	Verbal Description
know how to create, open and close documents	2.57	Very skilled
Know when to use Save and Save As	2.55	Very skilled
know how to format text	2.46	Very skilled
know how to use cut, paste, and format painter	2.31	Moderately skilled
can set page margins and page breaks	2.32	Moderately skilled
can set indents and tab stops, section breaks and partial formats.	2.19	Moderately skilled
know how to use bullets and numbering	2.29	Moderately skilled
can insert and format shapes, pictures and ClipArts	2.19	Moderately skilled
can set headers and footers	2.14	Moderately skilled
can use tables to present information	2.32	Moderately skilled
can add borders and shadings to tables and paragraphs	2.19	Moderately skilled
can use templates for standard documents.	2.08	Moderately skilled
know how to use word wrapping	2.02	Moderately skilled
know how to set up the margins, size, and orientation of the document before printing	2.29	Moderately skilled
Grand Mean	**2.29**	**Moderately skilled**

Table 4. Description of Computer Literacy of Respondents in the Area of Spreadsheet

Variable	Mean	Verbal Description
can enter and format text and numeric data	2.27	Moderately skilled
know how to wrap and shrink text	2.06	Moderately skilled
can insert, delete and format cells	2.29	Moderately skilled
can change the column width and row height	2.26	Moderately skilled
can insert and delete rows and columns	2.26	Moderately skilled
know how to apply and format borders in a cell	2.25	Moderately skilled
know how to merge and split cells	2.27	Moderately skilled
can enter a simple formula and function	2.15	Moderately skilled
can enable gridlines to be shown on prints	2.01	Moderately skilled
can move, copy and rename worksheets	2.22	Moderately skilled
can link cells between worksheets	2.06	Moderately skilled
can sort data in a column	2.21	Moderately skilled
can produce a chart from my data	1.95	Moderately skilled
know how to insert currency to a value in a cell	1.93	Moderately skilled
can print part of a worksheet	2.07	Moderately skilled
Grand Mean	**2.15**	**Moderately skilled**

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Table 5. Description of Computer Literacy of Respondents in the Area of Database

Variable	Mean	Verbal Description
can create a new database	1.47	Fairly skilled
can design a table and add new fields	1.62	Fairly skilled
know what primary key is	1.54	Fairly skilled
know what an index is	1.45	Fairly skilled
can enter data in a table	1.88	Moderately skilled
can print a table	1.91	Moderately skilled
can add and delete records	2.00	Moderately skilled
can sort data	1.79	Moderately skilled
can filter records	1.57	Fairly skilled
can find data using the find command	1.54	Fairly skilled
can find a data using a query	1.41	Fairly skilled
can select records using more than one criterion	1.36	Fairly skilled
can create a report using the report	1.43	Fairly skilled
can create a form using the form	1.47	Fairly skilled
can enter and edit data in a form	1.62	Fairly skilled
Grand Mean	**1.60**	**Fairly skilled**

Table 6. Description of Computer Literacy of Respondents in the Area of Multimedia Presentation

Variable	Mean	Verbal Description
can create a new presentation	2.03	Moderately skilled
can add different slide layout to my slide	1.97	Moderately skilled
can add a design template to my presentation	1.96	Moderately skilled
can add and format an image and illustrations to my slide	1.89	Moderately skilled
can add and format text to my slide	1.97	Moderately skilled
can insert, delete, and duplicate slides	1.95	Moderately skilled
can add a hyperlink text and objects to my slide	1.78	Moderately skilled
can create, edit and view a slide master	1.87	Moderately skilled
can insert sounds and videos to my slide	1.77	Moderately skilled
can create an organizational chart	1.70	Moderately skilled
can create charts related to data	1.70	Moderately skilled
can import objects from other files	1.75	Moderately skilled
know how to use rehearse timings and slide transition	1.75	Moderately skilled
can create effects on slides and objects (animate objects)	1.83	Moderately skilled
know how to start and end a slideshow	1.96	Moderately skilled
Grand Mean	**1.86**	**Moderately skilled**

Table 7. Description of Computer Literacy of Respondents in the Area of Communication and Internet

Variable	Mean	Verbal Description
can create a new presentation	2.03	Moderately skilled
can add different slide layout to my slide	1.97	Moderately skilled
can add a design template to my presentation	1.96	Moderately skilled
can add and format an image and illustrations to my slide	1.89	Moderately skilled
can add and format text to my slide	1.97	Moderately skilled
can insert, delete, and duplicate slides	1.95	Moderately skilled
can add a hyperlink text and objects to my slide	1.78	Moderately skilled
can create, edit and view a slide master	1.87	Moderately skilled
can insert sounds and videos to my slide	1.77	Moderately skilled
can create an organizational chart	1.70	Moderately skilled
can create charts related to data	1.70	Moderately skilled
can import objects from other files	1.75	Moderately skilled
know how to use rehearse timings and slide transition	1.75	Moderately skilled
can create effects on slides and objects (animate objects)	1.83	Moderately skilled
know how to start and end a slideshow	1.96	Moderately skilled
Grand Mean	**1.86**	**Moderately skilled**

Table 8. Summary Table on Computer Literacy of Respondents

Computer Skills	Weighted Mean	Verbal Description
General Computer Operations	2.49	Very Skilled
Word Processing	2.29	Moderately skilled
Spreadsheets	2.15	Moderately skilled
Databases	1.60	Fairly skilled
Multimedia Presentation	1.86	Moderately skilled
Communications and Internet	1.62	Fairly skilled
Grand Mean	**2.00**	**Moderately skilled**

The respondents are moderately skilled in all the categories presented in using the spreadsheets as shown in their grand mean of 2.15 (Table 4). This suggests that the skills of the respondents are sufficient for a basic task only.

The respondents are fairly skilled in selecting records using more than one criterion in a database application as shown by their mean of 1.36 (Table 5). However, in adding and deleting records in a database table the respondents are moderately skilled as shown by their mean of 2.0.

The grand mean of 1.60 suggests that the respondents are “fairly skilled” which means that their skills are limited only for most tasks in the area of the database application.

Table 6 shows that the respondents are moderately skilled in all the competencies tested in the multimedia presentation as shown by their general mean of 1.86. This suggests that their skills are sufficient for a basic task only in the area of multimedia presentation.

Table 7 provides data that the respondents are fairly skilled in using an online discussion forum as shown by their mean of 1.37. In the skill of connecting to the internet with their modem, the respondents are moderately skilled as shown by their mean of 2.27.

The grand mean of 1.62 suggests that the respondents are “fairly skilled” which means that their skills are limited only in the area of Communication and Internet.

While in Table 8, the respondents are very skilled in the area of general computer operations that have the highest computed weighted mean of 2.49. This means that the respondents have adequate knowledge on most tasks as to the general operation of the computer system.

From the same table, it is presented that respondents are very skilled in the area of general computer operations that have the highest computed weighted mean of 2.49. This means that the respondents have adequate knowledge on most tasks as to the general operation of the computer system.

In the area of Word Processing, Spreadsheets, and Multimedia Presentations, the respondents are moderately skilled which means that their skills are sufficient for a basic task only, as shown in their weighted mean of 2.29, 2.15, and 1.86 respectively. In the area of Databases, and Communication and Internet, the respondents are fairly skilled which means that they have limited ability to perform the competencies on these applications.

The grand mean shows that the respondents are noted that they need more training in the area of word processing, spreadsheets, and in creating a multimedia presentation, as they are "moderately skilled" in this area which means that their knowledge is sufficient to perform basic operations only.

Several research studies have indicated that teachers' lack of knowledge and skills have become primary factors in the failure of a computer technology integration program in the institution. Many teachers can only operate basic computer programs although the computers they use can provide them with a more advanced facility (Marwan & Sweney, 2010).

Difference in the Respondents’ Computer Competencies as Grouped According to Their Personal Variables

From the table, the difference in the computer literacy of the respondents when grouped according to age, computer training attended, number of computer usage per week in the office and at home, years of teaching, computer applications used in teaching are significant. However, the respondents when grouped according to sex, highest educational attainment, number of subjects taught and the number of owned computers are not significant in the computer literacy of the respondents.

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Table 9. Difference in the Respondents' Computer Competencies as Grouped According to Their Personal Variables

Variables	Probability Value	Significance
Age	0.0000	Significant
Sex	0.1855	Not significant
Highest educational attainment	0.7052	Not significant
number of subjects taught	0.2997	Not significant
computer training attended	0.0354	Significant
number of hours of computer usage per week: office	0.0000	Significant
number of hours of computer usage per week: home	0.0003	Significant
years of teaching	0.0001	Significant
computer application used in teaching	0.0000	Significant
number of owned computers	0.0730	Not significant

The findings show that younger teachers have higher computer literacy as compared to those who were older. It is also found out that the more computer training attended by teachers and the more usage of computer in the office and at home, the higher the level of computer literacy than those who never attended any computer course and have less usage of computers.

The findings of this study were confirmed by the other findings of other researchers where teachers should have enough training in the utilization and the effect of technology on teaching (Marwan, 2008). More training is hereby needed to the teachers for them to integrate ICT in teaching and other related task assigned to them so as to uplift and enhance the quality of education (Caluza, Funcion, Verecio, & Quisumbing, 2017).

Furthermore, as shown in the years of teaching, teachers with more years of teaching have low computer literacy level than those who are newly hired. It was also found that teachers who used computer applications in teaching have higher computer literacy than those who never used computer applications.

Proposed Computer Literacy Program

Based on the findings of this research, a computer literacy program, both basic and advanced in the following area may be proposed for the Public Secondary teachers of Northeastern Cagayan as an extension program of the College of Information and Computing Sciences of Cagayan State University Gonzaga:

1. Word Processing
2. Spreadsheet Operation
3. Multimedia Presentation Operation
4. Database Operation
5. Communication and Internet Operation

However, in the area of general computer operations, advanced skills must be given to the respondents since they were already very skilled which means they have already adequate knowledge for most tasks in this area. Advanced features like computer systems servicing should also be given attention.

IV. CONCLUSION

The computer literacy level of the teachers in the areas of word processing, spreadsheet operations, database operations, multimedia presentation operations, and communications and internet are not adequate and are limited to do most tasks. Teachers are encouraged to update their level of computer literacy to cope up with the rapid advancement of ICT as an aid for instruction. To make them more competitive in these areas, essential training should be acquired by them.

It is recommended that a collaborative extension service must be offered to the public secondary school teachers of Northeastern Cagayan. Furthermore, attendance in any computer literacy training must be encouraged for all secondary teachers of Northeastern Cagayan.

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