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Digital Competence Level: An Evaluation of Area Coordinators and Emergency Response (ACER) Team ICT Proficiency

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Abstract— *Digital competence is a modern concept that describes technology-related skills which include media and communication, information and communications technology (ICT) literacy, technology and computing, and information science. To be digitally literate is essential for the involvement in the modern and knowledge-based society. One of the mandates of Bukidnon State University (BukSU) is to promote extension services and community outreach programs in the fields of Education, Arts and Sciences, Industrial and Business Information Technology. A training-workshop on ICT literacy to members of Area Coordinators and Emergency Response (ACER) of Malaybalay City is a response to the increasing use of ICT in the modern society to develop relevant skills to participate effectively in the digital age.*

This paper evaluates the digital competency level of the ACER members in Malaybalay City. The main purpose of an evaluation is to assess if the competences they acquire from the training-workshop contributes significantly to individual's personal development, the productivity of organizations, and to the economic growth of the agency, the local government unit (LGU) and the nation in general. The study is a combination of qualitative and quantitative research to evaluate the ICT proficiency level of ACER team in which descriptive data is generated using specific methods such as questionnaires, unstructured interviews, and observations from the participants. Open-ended questions were employed to capture judgments and observation on actual hands-on in the workplace were also conducted to probe and explain the relationships and contextual differences.

General findings revealed that most of the ACER members are proficient in using wordprocessing, the internet and social network, multimedia presentation, electronic spreadsheet and photo editing. As a result, some members are promoted to other agencies while others are retained in the ACER office. Through the BukSU extension project, the members of the ACER significantly contributes to the welfare of the agency and the locality as a whole.

Keywords— *Digital competence, BukSU extension project, ICT literacy.*

I. INTRODUCTION

In today's society, digital competence is both a requirement and a right of every citizen Ferrari (2012). It is a modern concept that describes technology-related skills which include media and communication, information and communications technology (ICT) literacy, technology and computing, and information science. Ilomaki, Kantosalo and Lakkala (2011) suggests that digital competence should have the following approaches: 1) technical skills to utilize digital technologies; 2) capabilities to use digital technologies in various ICT activities; 3) abilities to evaluate the digital technologies; and 4) motivation to participate in the digital culture. To be digitally literate is essential for the involvement in the modern and knowledge-based society. Accordingly, all people in the modern society must possess a certain level of ICT skills and knowledge to participate in different essential ICT activities.

One of the mandates of Bukidnon State University (BukSU) is to promote extension services and community outreach programs in the fields of Education, Arts and Sciences, Industrial and Business Information Technology. The Extension is defined as the conscious use of information according to van den Ban and Hawkins (1996) to help people form sound opinions and make good decisions and be able to apply what they learned from the training to improve their work and their livelihood in the future. Extension facilitates the access of clientele Christoplos (2010) to enable interaction within partners in research, education and other relevant institutions. It will also help them develop their own technical, organizational and managerial skills. A training-workshop on ICT literacy to members of Area Coordinators and Emergency Response (ACER) of Malaybalay City is a response to the increasing use of ICT in the modern society to develop relevant skills to participate effectively in the digital age.

ICT literacy as defined by Fraillon, Schulz, & Ainley(2013) as the ability of an individual to use computers to investigate, create, and communicate to participate effectively at home, at school, in the workplace, and in the society. Claro, et al. (2012) also defined ICT as the capacity to solve problems of information, communication, and knowledge in digital environments.

The European Commission 2016 reported that in digital environments, key competences for lifelong learning is digital competence. According to Somerville, et al. (2008), an individual that is ICT literate are better problem solvers, more self-directed, and communicate ideas more efficiently. In developing country like the Philippines, BukSU initiatives on extension services to integrate ICT helps the government to enhance and transform the delivery of services, accountability, and efficiency to the people. In the study of Colecchiaa and Schreyer (2002), ICT diffusion and ICT usage contribute to economic growth of the country.

This paper evaluates the digital competency level of the ACER members in Malaybalay City. The main purpose of an evaluation is to assess if the competences they acquire from

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the training-workshop contributes significantly to individual's personal development, the productivity of organizations, and to the economic growth of the agency, the local government unit (LGU) and the nation as a whole. Through this evaluation process, the researchers will likewise be able to find out what outcome the extension program of BUKSU had on the audience.

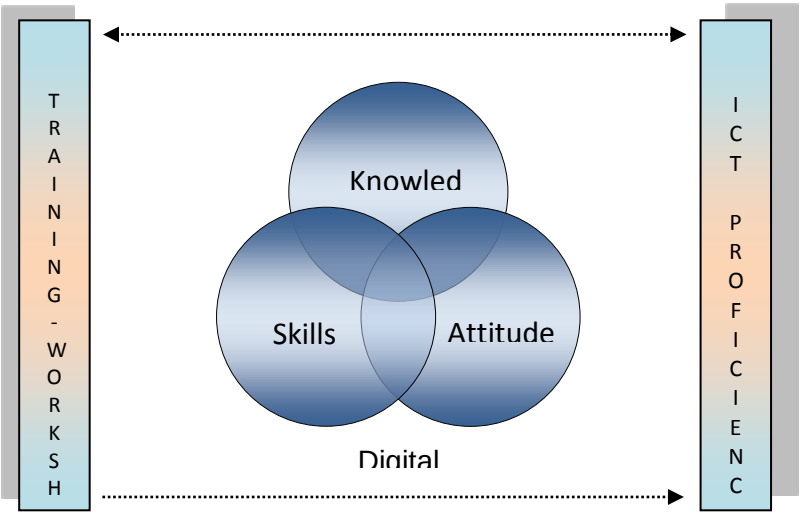

Figure 1. Conceptual Framework of ACER ICT Proficiency Evaluation

The diagram shows the conceptual framework of the ACER ICT Proficiency evaluation that is anchored from the study of Ferrari (2012). Digital competence is the ability of the ACER team to keep abreast with the rapid changes in the area of ICT. It comprises the related knowledge, skills, and attitude they need to have to exploit ICT efficiently for their purposes, be it for their personal or professional life. Nowadays, to meet the demands of the workplace, an employee should be digitally competent. The ability of the ACER to use a specific set of applications in five modules and ICT tools that were introduced during the seminar-workshop is evaluated to know if they are proficient. Knowledge and skills coupled with appropriate attitudes support individual's requirements to be competent in the context of his or her work. Ilomaki, Kantosalo, and Lakkala (2011) states that a digital competency is more than knowledge and skills, it involves the ability to meet complex demands and mobilizing psychological resources including attitudes.

II. Methodology

The study is a combination of qualitative and quantitative research to evaluate the ICT proficiency level of ACER team in which descriptive data will be generated by using specific methods such as questionnaires, unstructured interviews, and observations from the participants. In the terminology used by Hentschel's (1999), to produce different types of data, qualitative and quantitative research tend to employ different methods.

A questionnaire developed by Commission on Information and Communications Technology (CICT) on their iSchools project was modified to fit with the training conducted by the department. After which, it was validated by an IT experts and extension coordinators. After the questionnaire was validated and distributed to 70 IT students for testing, the result was analyzed, modified based on the expert's feedback and utilized the questionnaire for evaluation of ACER team digital competence level. During the first meeting with the ACER team, leveling of expectations was done using the questionnaire. As for the pretest, their response served as the departments guide in customizing the training intended for them. After the training the same questionnaire was given to them as the post test, to figure out if they have learned from the series of training given to them. Pretest and post test results were tabulated and interpreted to see if there is a significant change in their response. The results of the posttest were also summarized to measure the level of skill they acquired from the training. Scales used for the summary in the skill level are based on *Teaching and Learning Research Programme* of the Universities of Edinburgh, Durham, and Coventry. Likewise, open-ended questions were also employed to capture judgments and perceptions and allow complex analyses of often non-quantifiable cause-and-effect processes. An observation on actual hands-on in the workplace was also conducted to probe and explain the relationships and contextual differences.

III. Results and Discussions

The ACER participants were evaluated based on their digital competence level in five different ICT modules namely Word processing, Electronic Spreadsheets, Presentation software, Image editing, the Internet and Social Network.

5 I am fully competent with this function/operation and could confidently explain it to others.
4 I am a regular and confident user of this function/operation.
3 I have used/done this function/operation occasionally but need further practice to be confident.
2 I am aware of this function/operation but have not experienced in using it.
1 I am not aware of / not have tried this function/operation/tool.

Table 1 shows the summary of responses of ACER participants in using word processing software before and after the training. Before the training, the majority of them has either used or done the different functions/operations in word processing but needs more practice or they are aware that there is such function/operation nonetheless, they were not able to use them yet. After the training, more than 70% of the respondents are fully competent with word processing functions/operation and could confidently explain it to others hence, in an indicator create letters using mail merge there are only 30% who can do the same. The respondents who rated 5 indicates that the skills is sufficient to perform daily word processing tasks, such as, producing routine letters, memorandums, and informal reports. Also, respondents with this level of skills, were able to apply and use basic formatting

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styles, editing options, printing functions, and understands the document page setup.

TABLE 1. Summary of Responses for Word Processing Before (Pre) and After(Post) Evaluation the Training

A. Word Processing	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	5		4		3		2		1	
Manage documents	0%	60%	0%	24%	75%	14%	25%	1%	0%	0%
Format text	25%	63%	0%	29%	50%	9%	25%	0%	0%	0%
Format paragraph	0%	61%	0%	27%	75%	11%	50%	0%	0%	0%
Format document	0%	64%	25%	26%	50%	10%	25%	0%	0%	0%
Move and copy text	0%	86%	25%	11%	50%	3%	25%	0%	0%	0%
Insert text	0%	81%	0%	14%	75%	4%	25%	0%	0%	0%
Delete text	0%	83%	0%	13%	75%	3%	25%	1%	0%	0%
Insert tables	0%	77%	0%	14%	75%	6%	25%	1%	0%	1%
Insert pictures and images	0%	81%	0%	13%	75%	4%	25%	1%	0%	0%
Create letters using Mail Merge	0%	31%	0%	29%	75%	27%	25%	11%	0%	1%
Preview a document	0%	80%	0%	17%	75%	3%	25%	0%	0%	0%
Print a document	0%	87%	0%	10%	0%	3%	0%	0%	0%	0%

TABLE 2. Summary of Responses to Spreadsheets Before (Pre) and After (Post) Evaluation the Training

B. Electronic Spreadsheet	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	5		4		3		2		1	
Manage workbooks	0%	37%	0%	36%	75%	23%	25%	4%	0%	0%
Select cells	0%	63%	0%	27%	75%	7%	25%	3%	0%	0%
Enter data in a cell	0%	66%	0%	29%	50%	3%	50%	3%	0%	0%
Insert and delete cells	0%	69%	0%	26%	75%	3%	25%	3%	0%	0%
Insert and delete rows and columns	0%	67%	0%	27%	50%	3%	50%	3%	0%	0%
Handle worksheets	0%	60%	0%	29%	75%	7%	25%	4%	0%	0%
Format data	0%	53%	0%	26%	50%	19%	50%	3%	0%	0%
Format cells	0%	44%	0%	33%	50%	20%	50%	3%	0%	0%
Format worksheet	0%	44%	0%	31%	50%	21%	50%	3%	0%	0%
Create formulas and functions	0%	41%	0%	30%	50%	24%	50%	4%	0%	0%
Create charts/graphs	0%	27%	0%	34%	50%	33%	50%	6%	0%	0%
Format charts/graphs	0%	34%	0%	23%	0%	39%	0%	4%	100%	0%
Distributes contents of a cell across separate columns	0%	29%	0%	29%	0%	39%	0%	4%	100%	0%
Combine values of multiple ranges into new range	0%	29%	0%	24%	0%	43%	0%	4%	100%	0%
Create and save a workbook based on a template	0%	21%	0%	26%	0%	47%	0%	6%	100%	0%
Create user-defined template and save it in a .xlt format	0%	30%	0%	27%	0%	31%	0%	9%	100%	3%
Use cell referencing from one worksheet to another	0%	30%	0%	29%	0%	31%	0%	10%	100%	0%
Preview a worksheet	0%	34%	0%	31%	50%	31%	50%	3%	0%	0%
Print a worksheet	0%	66%	0%	21%	50%	11%	50%	1%	0%	0%

Table 2 displays the summary of responses of ACER participants in using Spreadsheet software before and after the training. Similar to the previous table, before the training, the participants have either used or done the different functions/operations in spreadsheets but needs more practice or they are aware that there is such function/operation nonetheless; they were not able to use them yet. In this table, however, there were some of the functions/operations/tools, 0% awareness. After the training those who answered 1, more than 60% of them are already familiar and can do the following: format charts/graphs, distributes contents of a cell across separate columns, combine values of multiple ranges into new range, create and save a workbook based on a template, create user-defined template and save it in a .xlt format, use cell referencing from one worksheet to another.

Table 3 shows the pre-evaluation and post-evaluation of the ICT skills of ACER members in utilizing ICT specifically in the use of multimedia software. It was shown that before the training, more than 50% of the participants rated 3, others rated 2 and 1 respectively. This means that they use the function/operation occasionally but need further practice to be confident, others are even not aware or not have tried the functions, operations, and tools of multimedia software. After the training, about 50% of the participants rated 5, 30% rated 4 and only a few rated 3. This means that 50% of the participants are fully competent with the functions/operation and could confidently explain to others the relevance and use of this module, others have regularly and confidently use the software and only a few have used/done the function/operating occasionally but need further practice to be confident.

TABLE 3. Summary of Responses for Multimedia Presentation Before (Pre) and After(Post) Evaluation the Training

C. Multimedia Presentation	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	5	5	4	4	3	3	2	2	1	1
Discuss basic presentation skills	0%	43%	0%	30%	25%	24%	75%	1%	0%	1%
Apply appropriate visuals and design considerations	0%	40%	0%	30%	50%	29%	50%	0%	0%	1%
Manage presentations using a presentation tool	0%	47%	0%	29%	50%	21%	50%	1%	0%	1%
Create slides	0%	76%	0%	20%	50%	1%	50%	1%	0%	1%
Use different slide views	0%	70%	0%	21%	50%	6%	50%	0%	0%	3%
Apply slide layouts and templates	0%	69%	0%	23%	75%	6%	25%	1%	0%	1%
Format text	0%	71%	0%	21%	75%	4%	25%	1%	0%	1%
Insert pictures and images	0%	73%	0%	21%	50%	3%	50%	3%	0%	1%
Insert drawn objects	0%	69%	0%	19%	50%	9%	50%	3%	0%	1%
Create charts/graphs	0%	56%	0%	23%	50%	20%	50%	0%	0%	1%
Create a slide show	0%	70%	0%	21%	50%	7%	50%	0%	0%	1%
Apply slide show effects	0%	67%	0%	20%	50%	11%	50%	0%	0%	1%
Use hyperlink and action button	0%	54%	0%	21%	50%	17%	50%	4%	0%	3%
Prepare outputs	0%	63%	0%	21%	50%	10%	50%	3%	0%	3%
Print slides	0%	73%	0%	19%	50%	6%	50%	0%	0%	3%

TABLE 4. Summary of Responses for Photo Editing Before (Pre) and After(Post) Evaluation the Training

D. Photo Editing	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	5		4		3		2		1	
Discuss basic photo editing	0%	39%	0%	37%	0%	1%	0%	1%	100%	0%
Use and apply appropriate tools and functions	0%	31%	0%	40%	0%	1%	0%	1%	100%	0%
Specify page layout and format	0%	33%	0%	40%	0%	1%	0%	1%	100%	0%
Duplicate The Background Layer	0%	60%	0%	26%	0%	1%	0%	1%	100%	0%
Add and remove Layers	0%	63%	0%	30%	0%	1%	0%	1%	100%	0%
Hide/Unhide layers and other objects	0%	66%	0%	24%	0%	3%	0%	3%	100%	1%
Use different tools in the toolbox	0%	44%	0%	27%	0%	1%	0%	1%	100%	3%
Save as .jpeg and .png format	0%	86%	0%	13%	0%	0%	0%	0%	100%	0%

TABLE 5. Summary of Responses for the Internet and Social Networks Before (Pre) and After(Post) Evaluation the Training

E. Internet and Social Network	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	5	5	4	4	3	3	2	2	1	1
Discuss the Internet and World Wide Web	0%	54%	0%	24%	50%	20%	50%	1%	0%	0%
Access the Web	0%	79%	0%	17%	75%	4%	25%	0%	0%	0%
Search the Web	0%	80%	0%	17%	75%	3%	25%	0%	0%	0%
Download specific file from web pages	0%	83%	0%	13%	75%	4%	25%	0%	0%	0%
Send and receive email with attachment	0%	80%	0%	13%	50%	4%	50%	0%	0%	0%
Create social network group through FB page	0%	81%	25%	11%	50%	6%	25%	1%	0%	0%
Organize messages	0%	66%	0%	23%	75%	9%	25%	3%	0%	0%
Print messages	0%	63%	0%	20%	75%	14%	25%	3%	0%	0%

In Table 4, it is evident that, before the training, none or 0% of the participants are aware of photo editing functions/operations/tools. After the training, 86% of them can already save pictures in .jpeg and .png formats; more than 60% can already perform the following using Photoshop, Hide/Unhide layers and other objects; Add and remove Layers and Duplicate The Background Layer. While more than 30% can specify page layout and format; use and apply appropriate tools and functions, and discuss basic photo editing using Photoshop.

Table 5 shows the pre-evaluation and post-evaluation of the ICT skills of ACER members in utilizing ICT specifically in the use of Internet and Social Networks. It was revealed that before the training, 75% of the participants rated 3 as the highest, which means that they use the function/operation occasionally, but need further practice to be confident. In an indicator, create a social network group through FB page, 25% of the participants rated 4 which means that they regularly and confidently use the function/operation about the Internet and Social Network. After the training, more than 80% of the participants rated 5, which means that they are fully competent with the functions/operation, and could confidently explain to others the relevance and use of this module. In an indicator, discuss the Internet and World Wide Web, 54% of the participants rated 5, 24% rated 4 and 20% rated 3. This means that the participants are not that confident in discussing what is World Wide Web is all about.

Summary of the ACER team before and after the training was also considered. Learning experience scale based on the *Teaching and Learning Research Programme* of the Universities of Edinburgh, Durham, and Coventry was adopted.

4.21-5	5	I am fully competent with this function/operation and could confidently explain it to others.
3.41-4.20	4	I am a regular and confident user of this function/operation.
2.61-3.40	3	I have used/done this function/operation occasionally but need further practice to be confident.
1.81-2.60	2	I am aware of this

		function/operation but have not experienced in using it.
1-1.8	1	I am not aware of / not have tried this function/operation/tool.

TABLE 6. Summary of ICT skills for the Pre Test and Post Test

ICT Modules	Pre Test Mean	Post Test Mean
A. Word Processing	2.70	4.60
B. Electronic Spreadsheets	2.07	4.15
C. Multimedia and Presentation	2.40	4.43
D. Photo Editing	1.00	4.33
E. The Internet and Social Media	2.56	4.63

The summary depicts the skills acquired before and after the learning experiences acquired by the team per ICT modules used during the training workshop. On the pretest, photo editing has been the lowest, this means that they might be aware of photo editing but have not used the software, this software is specifically requested by the team since during the response, they are required to take pictures and they need to learn how to enhance the pictures, add labels and put marks on areas that need to be pointed out or collage them when they are to make reports. For the highest mean of 2.70 if fell under Word processing software this means that they have used/done the different functions/operations occasionally but need further practice to be confident. Comparing it to the post test result the highest had been Internet and Social Media 4.63 and Word processing which is 4.60. According to one of the interviews we had, Word Processing is the one they commonly used in making reports per employee. Consequently, using the internet and social media, they have used it to increase awareness of the community in terms the steps in reporting an incident and posting some interesting pictures that will attract the community to report incidents properly. The lowest average mean is of Electronic Spreadsheets which is 4.15, based on the interview, it was mentioned that only specific set of employees are using the software for their reports leading to some of the ACER team not focusing much on the software.

IV. Conclusion

General findings revealed that most of the ACER members are proficient in using Word Processing, the Internet and social network, multimedia presentation, electronic spreadsheet, and photo editing. Likewise, the majority of them can print using the different software applications mentioned. As a result, some members are promoted to other agencies while others are retained in the ACER office since the computer skills they acquired from the training speed up most of the office operations. The researchers would like to recommend that the team will constantly use the different software application imparted to them, that way they will not be able to forget what they learned from the training.

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