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Enhancing Capacity on Data Analysis among Gender and Development Focal Persons Through Training

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Abstract

Gender and development (GAD)-related issues are important topics in nation building. GAD focal persons in government agencies are identified to mainstream implementation of GAD-related activities to include research and development. However, one of the limiting factors in gender-related research is the lack of technical knowledge on data analytics which is fundamental for decision-making.

The Socio-Economics Research and Data Analytics Center in Luzon (SERDAC–Luzon) was established as a government's response to this limitation. The Center aims to enhance the capacity of researchers in basic and advanced socio-economic research, especially on the use of statistical software for data analytics to a range of gender issues. Trainings were conducted among GAD focal persons to enhance their competency on the use of SPSS for data analytics. Lectures, discussions, and workshops using the software were the teaching modalities.

Data on the GAD focal person participants in the trainings conducted at two universities were used. The pre- and post-assessment scores were the variables, and the differences of the scores indicated the effects of the training on their competency and level of knowledge.

Differential response of the male and female participants was also analyzed. There was a difference in the level of competency and knowledge in data analysis and the use of the software by gender as indicated in the participants' pre- and post- assessment scores. The training was effective in providing the participants knowledge and skills. The trainings contributed to the improvement of the participants' competency on the use of the software and knowledge for data analytics.

Keyword: *GAD Focal Point System, socio-economics, data analytics, capability building, SERDAC*

Introduction

Research is a fundamental part of modernization and innovations. Research is a process of discovery (Neuman, 2014), a problem-solving activity based on systematic and scientific procedures to generate knowledge and information aimed to provide solution to a given problem. Information generated from scientific research can be important inputs for decision-making. Data analysis is an important part of research. The Responsible Conduct of Research (RCR) website of the Northern Illinois University defined data analysis as the "process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data" (Faculty Development and Instructional Design Center, 2005).

Gender and development (GAD) issues call forth the attention of lawmakers and researchers. The magnitude of the challenges under GAD necessitates the conduct of Research and Development (R&D) programs to address GAD issues.

The Republic Act No. 9710 Magna Carta of Women Section 36: Gender Mainstreaming Strategy states the adoption of gender mainstreaming as a strategy to promote women's human rights, and eliminate gender discrimination in systems, structures, policies, programs, processes, and procedures of all departments, including their attached agencies, offices, bureaus, state universities and colleges, government-owned and -controlled corporations, local government units, and other government instrumentalities.

In response, the Central Luzon State University (CLSU), one of the leading state universities 150 km north of Manila, Philippines, has created the University Gender and Development Office (UGADO). Each unit of the University has a focal person who is engaged in conducting R&D projects and other activities on GAD-related issues. Similarly, the Romblon State University (RSU), located in an island province of Romblon, south of Manila, has its own GAD focal persons. The GAD focal persons have varying characteristics, experience, and capabilities to engage in GAD-related R&D projects. Capacitating them on data analysis of gender-related data is essential. The administration of both universities have recognized this need, and are in search for modalities and opportunities for capacity-building. As defined by the United Nations Academic Impact, capacity-building is a process of developing and strengthening the skills, instincts, abilities, processes, and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world. It involves much more though than just conducting training courses and workshops (Bemmerlein-Lux et al., 2011).

In 2017, the Department of Science and Technology-Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (DOST-PCAARRD) funded the project entitled "Socio-Economic Research and Data Analytics Center (SERDAC) in the. Philippines" (SERDAC-Luzon). Three centers were established: one each in the three major island groups in the Philippines, such as Luzon, Visayas and Mindanao. In Luzon, it was implemented by the CLSU, in Visayas by the Visayas State University (VSU), and in Mindanao by the University of South Eastern Philippines (USEP). The main purpose of SERDAC is to build the capacity of researchers including those of the GAD Focal Point System (GFPS) or focal persons in socio-economic data analysis. The capacity building services of SERDAC included the provision of trainings and workshops on socio-economic data analysis using appropriate methodology and software.

SERDAC-Luzon capacitated GAD focal persons from two institutions, namely CLSU and Romblon State University (RSU) with funding from their respective Gender and Development Offices. Three-day training activities were conducted separately in CLSU and RSU using the same modules with emphasis on socio-economic data analysis using the Statistical Package for Social Sciences (SPSS) software. The trainings aimed to capacitate the GFPS in conducting gender-related research and provide them additional knowledge and skills on the methodology to analyze socio-economic data. It was hoped that the participants would have improved knowledge and skills after the training with their pre-and post-assessments as basis. Results of the assessments provided the training management an indicator of the effectiveness of the trainings. Because gender is an important variable concerning students' learning (Shawwa & Abulaban, 2014), the differential effect of the trainings on male and female participants' competencies and knowledge were examined. The approach allowed for the measurement of differences between male and female participants' responses to the effectiveness of the trainings to improve their competencies. Thus, these differences could be considered in GAD's future efforts in establishing gender statistics and taken as an integral part of future capability-building activities. Moreover, results of this study could provide inputs as basis for building further the capacity of GFPS for them to become more responsive to the challenges involving R&D on gender and development issues.

Objectives

Generally, the study assessed the effectiveness of the training to improve the knowledge and skills of male and female GFPS participants in analyzing socio-economic data using SPSS.

Specifically, this study aimed to:

1. describe the socio-demographic characteristics and the percent involvement in research, extension, teaching, administration, and production functions of the GFPS participants;
2. describe the training activity conducted to capacitate the GFPS participants; and

3. determine and compare the level of competency and level of knowledge on socio-economic data analysis and use of SPSS of male and female GFPS participants before and after the training.

Hypotheses

1. The three-day training increased the level of participants' competencies on using SPSS and knowledge on socio-economic data analysis.

2. Male and female participants have the same levels of competencies on using SPSS and knowledge on socio-economic data analysis before and after the training.

Methodology

Training as a Capability-Building Approach

SERDAC conducted trainings on basic socio-economic analysis with application using the software SPSS in two institutions, namely, CLSU and RSU. The participants were composed of 57 faculty and staff who were the GAD focal persons in their institutions. They were trained on basic data analysis as an approach to developing their capacity as R&D implementers. The data gathered from the participants served as the sample data for analysis.

Socio-economic analysis forms an integral part of any R&D project. The analysis could be employed in issues related to poverty alleviation, sustainable development, environmental protection (SERDAC, 2018), and people empowerment, among others. Capacity-building is defined as the process of developing and strengthening the skills, instincts, abilities, processes, and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world (Philbin, 1996). An essential part of capacity building is its ability to transform performance to a suitable practice. Hence, universities, in particular, can serve as centers of capacity-building through research, innovation, data collection, and analysis (United Nations, n.d.).

The training was conducted for three (3) consecutive days composed of 8-hour per day training for a total of 24 training hours. It had eight modules (Table 1) which focused on software interface, familiarization with statistical terminologies, theories and assumptions on data analysis, and execution of the analysis using Statistical Package for Social Sciences SPSS v26 licensed at SERDAC. SPSS is one of the leading software worldwide that is commonly used in predictive analytics in academic and R&D circles. It is a Windows-based program that can perform management and analysis of socio-economic data. It is a very versatile package that allows many different types of analyses, data transformations, and forms of output needed by researchers (Arkkelin, 2014).

Table 1
The training module's topical outline

No.	Title
Module 1	Re-Glimpse to SPSS (Introduction to SPSS)
Module 2	Labelling and Formatting Data Importing Excel File Data to SPSS
Module 3	Manipulating SPSS to Do Descriptive Statistics
Module 4	Investigating Differences on Means of Quantitative Socio-Economic and other Variables (One and Two Sample t-tests) Investigating Differences on Means of Quantitative of Socio-Economic and other Variables (One Way ANOVA)
Module 5	Investigating Relationships of Socio-Economic and other Variables (Pearson, Spearman, Point Biserial Correlations, and Chi-Square Test of Independence)
Module 6	Performing Simple and Multiple Linear Regression to Analyze Relationships of Socio-Economic and other Variables
Module 7	Binary, Ordinal, and Multinomial Logistic Regression to Analyze Relationships of Socio-Economic and other Variables

The training primarily aimed to improve the GAD focal persons' knowledge and skills on socio-economic data analysis using SPSS through interactive learning. To impart knowledge, the resource persons delivered lectures on the different topics using PowerPoint presentations of terminologies, basic statistical analysis and assumptions, approaches to data analysis, and some applications to GAD and socio-economic issues. Prior to the lectures, the participants were given e-copies of the presentations downloaded to their personal computers or laptops. In between lectures, participants were encouraged to ask questions for clarification on the subject matter, and to share knowledge and exchange ideas within the group.

To improve the participants' skills, hands-on exercises were given after Module 2 to Module 7 (Table 2). Exercises for Modules 2–5 made use of the data on waste management practices of students residing in CLSU dormitories while for Modules 6–7, hypothetical data on employment was used. Four to five groups of three to four members were formed to work on the exercises. The participants were allowed to choose their group members. Appropriate time was allotted per exercise. Each group was assigned to discuss and submit the results of the exercises. Questions were allowed to clarify the subject matter and application of SPSS. The exercises were graded accordingly and were used to indicate the level of the trainees' acquisition of new knowledge and skills on data analysis and use of the SPSS.

Table 2
Hands-on exercises by module

	Exercise	
Module No.	No.	Description
2		Organization and cleaning of data in SPSS Identification of the variable's level of measurement
3	1–8	Describing the socio-demographic characteristics of the respondents using frequency, percentage, mean, SD, range. cross-tabulation table, and appropriate graphs
4	1–7	Identifying significant difference on the average of one or more groups • One sample • Independent sample • Dependent or paired sample • Three or more groups
5	1–6	Performing correlation analysis between pairs of variables
6	1–4	Describing the dependent and independent variable/s using descriptive statistics Determining the coefficients of the regression model Identifying significant coefficients Writing the final regression model and interpretation
7	1–6	Constructing conceptual framework Fitting the model and estimate its parameters Writing the final logistic model and interpretation

The GFPS Participants and Data Gathered

GAD focal persons who were interested and in need of generating additional knowledge and skills on socio-economic analysis comprised the participants. The performance of the 57 trainees (32 from CLSU and 25 from RSU) who completed the 3-day trainings were the focus of this study. Because of the low number of male participants from each (SCU), the segregation according to sex was not done separately for CLSU and RSU. Instead, the data for both SCUs were pooled in the analysis. The information about the GFPS participants were on socio-demographic profile, institutional position characteristics, and level of competency in using SPSS and knowledge on the subject matter covered during the training. These were taken from the SERDAC forms (Table 3) the participants accomplished before and after the training. According to Brieger's (2006) lecture on evaluating training programs, the outcome evaluation aims to look for evidence that trainees have acquired new knowledge, attitudes, and skills and identify the trainees on their perceived gains or gaps. Thus, the use of tools such as post-test questionnaires and feedback forms are essential. Moreover, a 20-item questionnaire on topics covered at the training served as a tool for outcome evaluation.

Pre-and Post-Assessments

Two assessments were conducted, the pre-and post-assessment of the participants' competency on the use of the software SPSS, and the pre-and post-examinations to assess their knowledge on the training's subject matter. These assessments were based on the Kirkpatrick Evaluation Model for evaluating trainings which was developed by the University of Wisconsin Professor Donald Kirkpatrick. The model is a 4-level approach (1-Reaction, 2-Learning, 3-Behavior, 4-Results) to measure training effectiveness. This includes the key indicators such as test scores during and after the training and self-assessment questionnaires (Kurt, 2018). Measuring training effectiveness has proven to be an important tool to boost employee engagement and retention and results of past training also act as critical indicators while planning future workshops (Verma, 2020). Snapshots of a learner's abilities can give a clear picture of performance and skill improvements that can be attributed to the training. When institutions continue the development of their employees through capacity-building activities such as trainings and workshops, the trainings' effectiveness can be measured by the pre- and post-assessment.

The pre-assessment of competency and pre-examination of knowledge were given to the GFPS participants before the training as a measure of their initial level of competency and knowledge. After the training, post-competency and post-examination assessments were conducted.

The pre- and post-assessment of competency on the use of SPSS on data analysis is a self-rating of the participants, 0 to 10, lowest to highest rating, respectively. Whereas, the pre- and post-examinations were given to assess their level of knowledge on the different subject matter. The examinations were composed of 20 items of multiple-choice type of three selections per item. For each item, only one answer was correct, and given one point each. The questions were the same for both pre- and post-examinations. During the examinations, the participants were not allowed to copy, discuss, nor open their notes or computers. Moreover, the participants independently answered the questions during the examinations.

Table 3
SERDAC forms accomplished by training participants and used as data source

SERDAC Form No.	Title	Variable Content
Form 003	Pre-Evaluation	• Trainings attended • Expectation on the training • Level of competency on different statistical and economic tools
Form 004	Post-Evaluation	• Trainee impressions on quality of sessions i.e evaluation of training objectives, content, aspects, management, and overall impression. Ratings from 1 (Fair) to 4 (Excellent) • Attainment of expectations • Most significant learning/insights and appreciates in the training • Level of competency using SPSS • Training's improvement and participant's willingness to recommend the training course to others
Form 008	Participants' Information Sheet	• Socio-demographic profile
Test paper	Pre- and post-test	• A 20-item test covering the topics from the training module

Data Analysis

Univariate analysis such as frequency, percentages, mean, and SD were used in describing the data for the socio-demographic profile, institutional position characteristics, level of competency before and after the training, and the pre- and post- examination scores using the SPSS software acquired by SERDAC-Luzon from PCAARRD project funds. Moreover, bivariate analysis t-test, was also used to determine the differences between the pre-and post-assessment of competency and pre- and post-examination scores of male and female participants were determined. The paired differences were used as indicators of the change in competency and knowledge for having participated in the training. Moreover, the difference in pre-and post-level competencies and examination scores also served as the indicator of the differential response of the participants by sex to the training. The p-value < 0.05 criterion was used in determining significant differences.

Results

Socio-Demographic Characteristics of GFPS Participants

The socio-demographic characteristics of the trainees, such as age, civil status, and highest educational attainment classified according to sex are described (Table 4). The average age of the female trainees was 38 years and 35 years for males. Moreover, majority of the male participants were in the age range of 35 years old and below, whereas only 40% of the females are in the same age bracket. In terms of civil status, majority of the female trainees (69%) were married, but only 27% of male trainees were married. In essence, most of the male participants were single, attributed to being younger than their female counterparts. The GFPS members were relatively educated with 50% and 60% of the female and male trainees, respectively, with Master's degrees. Moreover, about 14% of the females and 27% of the male trainees had PhD degrees, indicating there were more males with PhDs.

Table 4
Socio-demographic characteristics of the GFPS participants

Profile	Sex				ALL	
	Male		Female			
	n=15	%	n=42	%	n=57	%
Age						
35 and below	9	60.00	17	40.48	26	45.61
36-49 years old	4	26.67	17	40.48	21	36.84
above 49 years old	2	13.33	8	19.05	10	17.54
Mean	*35.40*		*38.24*		*37.49*	
SD	*9.95*		*11.37*		*11.00*	
Civil Status						
Single	11	73.33	13	30.95	24	42.11
Married	4	26.67	29	69.05	33	57.89
Educational Attainment						
BS Degree	2	13.33	15	35.71	17	29.82
MS Degree	9	60.00	21	50.00	30	52.63
Ph Degree	4	26.67	6	14.29	10	17.54

GFPS Involvement in the University Functions

Research, teaching, and service roles are undertaken by the university's faculty to carry out the academic work of their respective institutions and to generate and disseminate knowledge to peers, students, and external audiences. The focal person's percentage of involvement in research, extension, production, teaching, and administrative work at the university is described (Table 5). Most of the male and female GFPS were performing various university functions. However, in 4 out of 5 aspects, there were more female GFPS who reported participation in the different functions of ≤25% of their time, while there were more male who reported higher percentage, >25% of their time. More than 95% of the female participants reported involvement in production and extension with <25% of their time, whereas the same percentage was reported by about 87% of the male participants. In addition, only about 55% female reported involvement in teaching of the same time percentage (<25%) because more were in >50% time allocation. On the contrary, there is seemingly the same proportion of male participants who are into teaching by percentage of time allocation.

Table 5
Trainees' involvement in different university functions

Functions and Involvement	Sex				ALL	
	Male		Female			
	n=15	%	n=42	%	n=57	%

Research						
25 % and below	12	80.00	37	88.10	49	85.96
26–50%	1	6.67	2	4.76	3	5.26
51–75%	2	13.33	1	2.38	3	5.26
76–100%	0	0.00	2	4.76	2	3.51
Extension						
25 % and below	13	86.67	40	95.24	53	92.98
26–50%	1	6.67	1	2.38	2	3.51
51–75%	0	0.00	0	0.00		0.00
76–100%	1	6.67	1	2.38	2	3.51
Production						
25 % and below	13	86.67	41	97.62	54	94.74
26–50%	2	13.33	0	0.00	2	3.51
51–75%	0	0.00	0	0.00	0	0.00
76–100%	0	0.00	1	2.38	1	1.75
Teaching						
25 % and below	4	26.67	23	54.76	27	47.37
26–50%	4	26.67	2	4.76	6	10.53
51–75%	3	20.00	9	21.43	12	21.05
76–100%	4	26.67	8	19.05	12	21.05
Administrative						
25 % and below	13	86.67	31	73.81	44	77.19
26–50%	2	13.33	2	4.76	4	7.02
51–75%	0	0.00	3	7.14	3	5.26
76–100%	0	0.00	6	14.29	6	10.53

GFPS' Level of Competency

Assessment through self-rating was used as the key indicator in measuring training effectiveness. The participants gave scores on the level of their competencies on using the software, before and after the training, using a numerical rating scale from 0 to 10, with 10 as the highest score. Among the male participants, the modal score was 5 before the training, while that of the female participants was 1 (Table 6). Close to 50% of the male participants rated themselves within the competency interval of 0–2 and 3–5, whereas 64%, of the female participants had scores from 0–2 and 21% from 3–5, indicating more female participants scored themselves with lower competency on the use of SPSS than their male counterparts. Very few participants from both groups rated themselves within the 6–8 score, and none within the 9–10 score. On the average, the female participants' before-training self-rating scores was 2.52 points (±2.01), while those of the male participants had an average of 3.13 (±1.85). When combined, the mean self-rating of all participants was 2.68 (±1.97).

As a measure of perceived change in competency after the training, the participants rated themselves using the same assessment form. Results showed that based on the modal response, there was a 1-point increase among male participants and 7 points among female participants in their self-competency rating. The mean values also indicated higher values after the training for both groups of participants. The frequency distribution of ratings constructed for the after the training also showed more than 70% of both male and female participants within the interval from 6–8, less than 10% from 9–10, only 20% from 3–5, and none within 0–2. The increase in numerical ratings indicates the self-assessed improvement in competency on the use of SPSS after the training. Notably, standard deviations (±1.41-±1.43) of the ratings after the training, both for the males and females, and combined, were lower and closer to their respective mean ratings.

Table 6
GFPS participants' level of competency

Score	Male				Female				ALL			
	Before		After		Before		After		Before		After	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-2	7	46.67	0	0.00	27	64.29	0	0.0	34	59.65	0	0.00
3-5	7	46.67	3	20.0	9	21.43	9	21.43	16	28.07	12	21.05

6-8	1	6.67	11	73.33	6	14.29	32	76.19	7	12.28	43	75.44
9-10	0	0.00	1	6.67	0	0.00	1	2.38	0	0.00	2	3.51
Mode	5		6		1		8		1		8	
Mean	3.13		6.6		2.52		6.67		2.68		6.65	
SD	1.85		1.40		2.01		1.43		1.97		1.41	

GFPS' Levels of Knowledge

A 20-item pre- and post-examinations with questions from the different modules served as the instrument to identify the training effectiveness in improving the participants' knowledge on the subject matter. Before the training, male participants had an average score of 9, with majority having scores of 6–10, 33% had 11–15, none had 16–20, and 13% had 1–5 (Table 7). On the other hand, the female had an average score of 8, with 19% each with scores of 1–5 and 11–15, and 5% with 16–20.

After the training, significant improvement in the post-exam score was recorded. About 73% of male participants had scores of 11–15 and 26% had 16–20 points. Interestingly, none of the male participants had scores below 11 after the training. Their mean score increased to 14 points, a difference of 5 points than the pre-training results. Similarly, the female participants also performed better after the training. About 70% had score of 11–15 and 19% had 16–20. None had scores of 0–5 and only 19% had 6–10. Their mean score also increased by 5 points, from 8 to 13 after the training. Results showed similar increment in scores after the training among male and female participants.

Table 7
GFPS participants' pre- and post-examination scores

Score	Male				Female				ALL			
	Pre-Exam		Post-Exam		Pre-Exam		Post-Exam		Pre-Exam		Post-Exam	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1-5	2	13.33	0	0.00	8	19.05	0	0.00	10	17.54	0	0.00
6-10	8	53.33	0	0.00	24	57.14	8	19.05	32	56.14	8	14.04
11-15	5	33.33	11	73.33	8	19.05	26	61.90	13	22.81	37	64.91
16-20	0	0.00	4	26.67	2	4.76	8	19.05	2	3.51	12	21.05
Mean	9		14		8		13		9		13	
SD	3.08		2.59		3.34		2.62		3.27		2.62	

Aside from the frequency distribution analysis of pre- and post-examinations, the mean percentage of correct answers per topic therein was also examined (Table 8). The pre-examination indicated the participants existing knowledge per topic while the post-test indicated in which topic they had an increase in knowledge. Overall, the analysis determined the changes in participants' knowledge per topic after the training, and whether they were statistically different.

The participants had low level of knowledge on the different topics as indicated by the pre-test scores. The participants had 55% correct answers about the software's interface, while in other topics, the scores were 27% on test of differences and 46% on regression analysis. The participants admitted the difficulty of the subjects but recognized that if given appropriate exposure their knowledge could be improved.

There was a significant increase in the participant's knowledge in most of the topics after the training. About 60% correct answers were recorded on descriptive statistics and test of differences, while 82% correct answers on SPSS interface were recorded. The percentage of correct answers also increased for correlation and regression analyses at 45% and 51%, respectively, but were relatively lower than the increase recorded in other topics.

Table 8
GFPS participants' pre- and post-test mean scores per topic

Contents	Percentage of Correct Answers	
	Pre-test	Post-test
SPSS Interface	55.00	82.50

Descriptive Statistics	37.50	67.50
T-test: Test of differences	27.50	62.50
Correlation Analysis	33.57	45.71
Regression Analysis	46.67	51.67

Skills Acquired by GFPS Participants

Learning by doing is the idea behind the hands-on learning for this can increase retention of the students (Martin, 2020). Moreover, hands-on learning is proven to be more effective in helping students grasp what they are taught because it engages both sides of the brain (Arnholz, 2019). These could explain the positive response of the participants to their level of competency on the use of the software after the training.

The workshop portion of the training included hands-on activities done per group; each group was composed of both male and female participants. Day 1 exercises included data management in SPSS, descriptive statistics, data visualization, and t-test. Day 2 exercises were correlation analysis and regression analysis, while Day 3 were on binary and multinomial logistic regression. The exercises had a total of 65 points, and the participants obtained an average of 44 points (Table 9), representing 69% of the total points.

Table 9
GFPS groups' scores in the daily hands-on exercises

Group No.	Day 1 Exercises	Day 2 Exercises	Day 3 Exercises	Total Scores	% of Total Score
1	28	14	6	48	73.85
2	29	3	3	35	53.84
3	23	12	12	47	72.31
4	28	13	12	53	81.53
5	25	9	12	46	70.77
6	23	10	7	40	61.54
Mean	26	10	9	45	68.97
SD	2.68	3.97	3.88	6.37	9.80

Effectiveness of Training among GFPS Participants

There are ways to measure training effectiveness such as post-training quizzes, one-to-one discussions, employee surveys, participant case studies, and official certification exams (Verma, 2019). In this study, training effectiveness was measured based on the participants' before and after levels of competency in using the software and the scores in a 20-item training test, and the use of t-test to determine statistical difference. Results showed that there are significant differences ($p<0.01$) in the average level of competency in using the SPSS software and the average examination scores before and after the training program (Table 10). This indicates the effectiveness of the training to improve participants' competency and knowledge. Training as a modality was also proven as an effective tool to increase knowledge in the study of Sopjani et al. (2017). However, the difference between the male and female participants in terms of their learning capabilities was not significant. Both groups exhibited similar positive changes from the training.

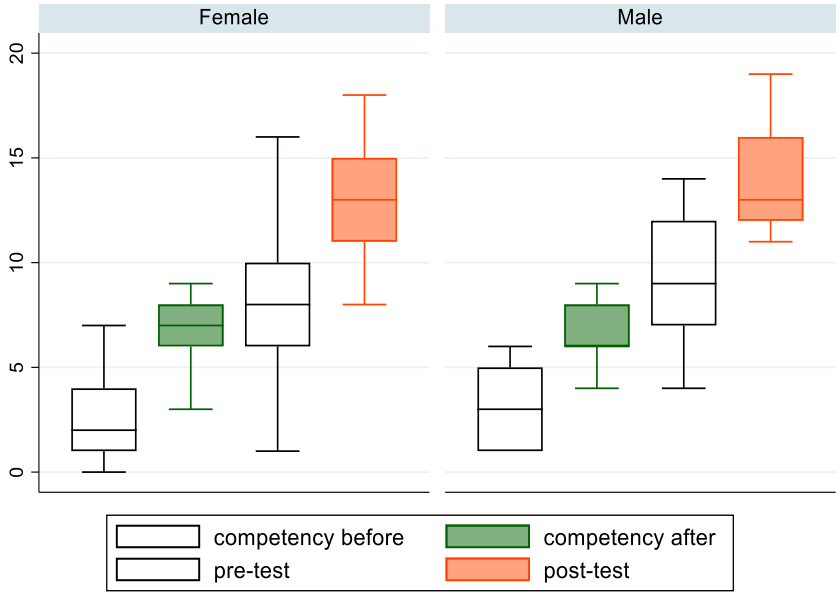
Table 10
T-test results of the GFPS' competency and exam scores before and after the training

Parameters	Male			Female			Overall		
	Mean	SD	t	Mean	SD	T	Mean	SD	t
Level of competency									
Before	3.13	1.85	6.85**	2.52	2.02	11.25**	2.68	1.97	13.11**
After	6.6	1.40		6.67	1.43		6.65	1.41	
Examination Scores									
Before	9.2	3.08	6.24**	8.45	3.34	11.42**	8.65	3.27	13.07**
After	14.13	2.59		13.12	2.62		13.39	2.62	

*Note. ** $p<0.01$, significantly different*

The distribution of the participants according to competency and knowledge scores are shown in the boxplot (Figure 1). Boxes pertaining to after-the-training scores for both parameters for male and female were plotted at a higher position, supporting further the result that the training improved the competency and knowledge of the participants.

Figure 1
Distribution of participants' competency and test scores before and after the training



Conclusion

The trainings on the basic methodology for socio-economic analysis using SPSS software conducted at the Central Luzon State University and Romblon State University increased the participants' level of competency, knowledge, and skills on the subject matter covered by the training. The pre- and post-assessment activities served as the tools to quantify training effectiveness. The training was effective in providing the participants knowledge on data analysis. The competency level and examination scores were significantly higher after the three-day trainings. The participants' retention of learnings and skills can be improved further through continued application, practice, and use of the analysis and software at work. Furthermore, the effect of the training was found to be similar among male and female participants, as both showed evidence of gain in learning as indicated by higher scores after the training. Thus, the conduct of similar trainings among other GFPS and researchers is recommended to contribute further to the participants' improvement on knowledge and skills on socio-economic data analysis and use of statistical software.

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