THE IMPACT OF TECHNICAL TRAINING TO LOCAL GOVERNMENT OFFICIALS: INPUTS TO ENHANCING COMMUNITY EXTENSION SERVICES OF A PHILIPPINE STATE UNIVERSITY

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ABSTRACT: Conducting technical training becomes essential for Higher Educational Institutions (HEIs) for this among others provide an avenue to carry out the vision-mission of the university in helping out the community. As such, a technical training program on Geotagging, Geographic Information System (GIS), and Environmental Protection Agency Network Evaluation Tool (EPANET) was conducted by the university for the employees of the Local Government Unit (LGU) of Alubijid, Misamis Oriental, Philippines. There have been many community extension services conducted in the past yet some of these are just short-lived or if not, sustainability is at stake. The main objective of the training was to train LGU employees with the basic technical skills on Geotagging, GIS, EPANET, which are deemed very essential for their day-to-day work operations. To determine the impact of the technical training program, an impact assessment was conducted among selected participants who attended the said training. Survey evaluation questionnaires and focus group discussions (FGD) were conducted to collect the necessary data for analysis. Findings revealed that community partners or beneficiaries have recognized the crucial contributions of the university in the process of knowledge transfer and management. These have been introduced and oriented to the software and they were able to execute important tasks in relation to the technical applications of these training software applications. These derived data would mean a careful deliberation of community and extension services of the university. Close coordination with the stakeholders and/or concerning beneficiaries of the intended project is needed as to conduct prudent planning, organizing, and leading of appropriate community and extension services of the university.

Keywords: impact assessment, technical skills, training program, local government employees, community extension services

1. INTRODUCTION

Technical training plays an essential role in developing essential labor market skills and capabilities of the employees in the workplace. Given enough equipment and machinery, employees should not be contented on how to use them rather they should be equipped with the necessary know-how [1]. Along this line, technical education is to develop an individual in a balanced way with his/her emotional, cognitive, economic, social, and personal aspects by establishing the appropriate skills, knowledge, attitudes, and professional habits required by an occupation that is essential for the individual's social and life [2]. Hence, it can be deduced that necessary training and provision of technical expertise have been vital in any organization. On one hand, universities, and colleges else in the world have been doing community and extension services; there have been many community extension services conducted in the past yet some of these are just short-lived or if not, sustainability is at stake. This study sought to determine these projects and activities aimed at helping and sustaining community services.

A review on the literature has provided a dearth of studies and related readings that would purport to how universities extend their extension and services to the community.

On another vital stance, one of the aims of the universities is to transmit their expertise including R & D results to the industry by bringing together the resources with the human potential [3]. In this regard, technical training is based on applications; and these have certain unique aspects and principles. To meet these ends, the universities and colleges across the globe have been keen to provide ideation and training to the different stakeholders. The success is based on the university industry-government relationship [4].

Others [5] stated that mapping the aesthetic demand and potential supply can promote awareness of both land value and the importance of natureconservation. Moreover, the value of Cultural Ecosystem Services (CES) is particularly difficult to measure, both physically and monetarily, because such values are intangibleand subjective [6]. Moreover, there are many CES studies on recreation, ecotourism, and the aesthetic value of landscapes because of their strong economic relevance and relative ease of estimation [7].

As a useful tool, EPANET tracks the flow of water in each pipe, the concentration of a chemical species throughout the network during a simulation period comprised of multiple time steps, the pressure at each node, and the height of water in each tank. In addition to chemical species, source tracing and water age and can also be determined. This has been designed to be a research tool for improving our understanding of the movement and fate of drinking water constituents within distribution systems. EPANET can help in assessing alternative management strategies for improving water quality throughout a system. These can include: (i) altering pumping and tank filling/emptying schedules, (ii) use of satellite treatment, such as re-chlorination at storage tanks (iii) altering source utilization within multiple source systems, (iv) targeted pipe cleaning and replacement [8, [9] testified that to avoid the leakage losses and various problems encountered with the present system, a detailed is study is conducted and the analysis is carried out using EPANET tool to design for continuous water supply. Through this method, the occurrence of problems such as water supply system frequent damage and failures due to improper maintenance in case of repairs and leakages be avoided [10]

2. FRAMEWORK OF THE STUDY

The conduct of the training program in the municipality of Alubijid, Misamis Oriental is presented in the following

figure. The officials of LGU Alubijid are responsible for the identification of the target beneficiaries.

The ultimate goal of this program is to help the engineering and planning division of LGU Alubijid to improve the technical know-how of the engineering technical staff and acquire basic knowledge and skills about software. After the training, the beneficiaries were asked to fill out the evaluation form.
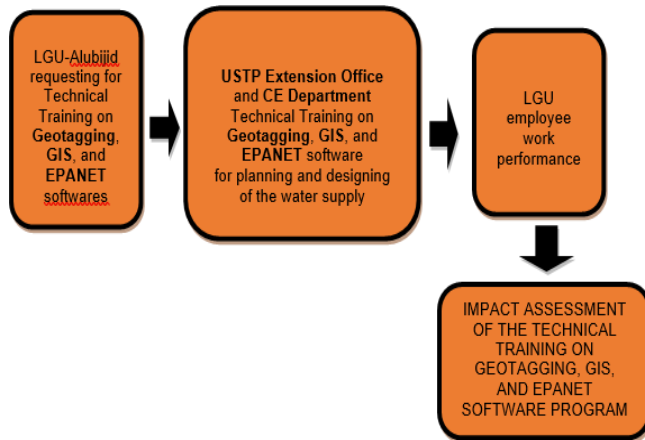
Figure 1. Process of Technical Training on Geotagging, GIS, and EPANET Software Program

The conduct of the rapid impact assessment of the technical training on Geotagging, GIS, and EPANET software program was anchored by the significant theories.

The Theory of Change by Rogers (2014) in an impact evaluation provides support for the conduct of this impact assessment. This theory explains how activities are understood to produce a series of results that contribute to achieving the final intended impacts. It can be developed for any level of intervention, an event, a project, a program, a policy, a strategy or an organization.

A theory of change can be developed for an intervention where objectives and activities can be identified and tightly planned beforehand or those changes and adapts in response to emerging issues and to decisions made by partners and other stakeholders. Sometimes the term is used generally to refer to any version of this process, including a results chain, which shows a series of boxes from inputs to outputs, outcomes and impacts or a log frame, which represents the same information in a matrix." The present rapid impact assessment holds the idea that the training program produces changes the way the beneficiaries work in the traditional way and apply what they have learned during the training to make ease in their work.

3.   LITERATURE REVIEW

Recently, studies estimating aesthetic value have used geotagged photos on social networking services instead of survey results of user preferences. The methods used inthese studies were cost-effective and provided spatially explicit results. However, thesemethods used photography positions. Using the photographed sites is a more direct method to estimate the aesthetic demand. This study would shed light on the conduct of geotagging in the municipality of Alubujid, Misamis Oriental.

In the same aspect, the use of EPANET presupposes the modeling of a water distribution network is required for accurate and efficient design as well as the optimal performance of a water distribution system both immediately after construction and in the future. The availability of increasingly sophisticated and accessible computer models allows these goals to be realized more fully than ever before. Computer-aided modeling and analyses is the new trend in the analysis of water supply systems [11]. This development can also contribute to the Civil Engineering Department's development of appropriate training in the analysis of water supply in the progressive town of Alubijid.

Using GIS has been dealt with [12] presented the integration of Building Information Modeling (BIM) and Geographic Information System (GIS) has been identified as a promising but challenging topic to transform information towards the generation of knowledge and intelligence. The achievement of integrating these two concepts and enabling technologies will have a significant impact on solving problems in the civil, building, and infrastructure sectors. The study found out that there are still many obstacles and challenges to the achievement of BIM and GIS integration.

These cited studies and related studies have provided a good elucidation to the conduct of this present study.

METHODOLOGY

In this present study, the quantitative data was derived from the survey questionnaire administered to the trainees of the technical training, and qualitative data were collected from the conduct of the Focus Group Discussion with the beneficiaries and the interview with their supervisors concerning their work performance after they are trained with the technical training on the aspects of GIS, geotagging and EPANET software.

This study was conducted at the municipality of Alubijid, Misamis Oriental where the technical training was conducted.

4.1 Participants

The respondents of this study were randomly selected from the beneficiaries of the technical training conducted. A survey questionnaire was used to obtain data from the respondents. A total of twenty respondents involved in this study are affiliated to the Engineering Division of the concerned LGU.

The Focus Group Discussion (FGD) was also conducted for the fifteen selected participants of the training program and the interview was conducted to the immediate supervisors of the participants of the training. This is to ascertain if the training conducted was absorbed by the participants and if they have utilized in their workplace. The data collected from the survey was analyzed using descriptive statistics such as frequency, percentage, mean and standard deviation.

RESULTS AND FINDINGS

The results below are presented in consonance with the order used in the presentation of the problems earlier.

Table 1 Respondents technical skills – before and after the training

GEOTAGGING		
SKILLS	Percentage	
	Before	After
S1. Knowledgeable in the World Coordinate System	16.67 %	66.67 %
S2. Known background and history of the GPS Devices	25.00 %	58.33 %
S3. Determine the varied fieldwork procedures using Garmin GPS	16.67 %	66.67 %
S4. Process the GPS Essentials	16.67 %	66.67 %
S5. Evaluate the data collection	16.67 %	58.33 %
S6. Process Data in geotagging	16.67 %	58.33 %
S7. Valued Importance of the use of GPS for Real-life Applications and Open Forum	16.67 %	58.33 %

Respondents have evaluated the learnt concepts, skills and knowledge gained from the technical training given by the Civil Engineering department. As shown above,through the applications of Geotagging, 66.77% knowledge rate was recorded, for they have been introduced and oriented to this helpful software. As recorded, *Knowledge in World Coordinate System, Fieldwork procedures using Garmin GPS* and *GPS essentials* were among the top learnt skills by the respondents.

This would only mean that they have valued the training given to them. [13] pointed out that geotagging as a process points to assigning of geographical coordinates to specimens. They further contend that it plays an important role in digitization projects, as it enabled the selection and analysis of specimens in their spatial terms. It is noteworthy to mention that there is still a need to develop practical and usable practice guides or a unified database that would enable to provision list of geographical information resources.

Geotagging allows search options by place, and when presented on a map it also allows better interactivity and adaptability as it facilitates new ways of finding (or browsing) content [14].

Through this yielded data above, the University is provided relevant data on geotagging know-how of the participants, and this can further contribute to the planning of engineering extension projects and activities. Similarly, the LGU officials of a local community situated in Alubijid, Misamis Oriental can be helped in the conduct of geotagging processes and procedures that they are much of need since their area has not been developed for the textual description of specimen locations.

Moreover, for GIS, it was evident that not only they were introduced but they wereable to execute important tasks in relation to this software application with 66.77%.The top-rated areas were identified as *Geodatabase Creation,* and *Spatial Analyst Tools* workshop. Ideally, this was made valuable since the value of cultural ecosystem services (CES) is particularly difficult to measure, both physically and monetarily, because such values are intangible and subjective. As cited by many researchers in the field, the most cited useful

applications of GIS for planning and management would coin to land use suitability mapping and analysis [15].

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Table 2. Respondents' technical skills – before and after the training (GIS)

GIS		
SKILLS	Percentage	
	Before	After
S1. Introduce to Remote Sensing	25.00 %	58.33 %
S2. Know the background and history of the GIS	25.00 %	58.33 %
S3. Know what GIS Software is	25.00 %	58.33 %
S4. Introduce to Geodatabase Creation	16.67 %	66.67 %
S5. Appreciated Vector and Raster File Accessing	25.00 %	58.33 %
S6. Perform Vector and Raster File Conversions	25.00 %	58.33 %
S7. Execute Spatial Analyst Tools workshop	16.67 %	66.67 %
S8. Create maps	16.67 %	58.33 %
S9. Introduce to Georeferencing	16.67 %	58.33 %

In this study, the focus of the use of GIS is geared toward appropriateness of land for agricultural purposes since Alubijid is chiefly an agricultural area; another crucial aspect is for the geographical assessment and in the selection of public and private sector facilities in catering to the fast-growing economic activities of this town, and on the areas of regional planning, which could greatly help the targeted town of Alubijid where respondents of this study are based.

As noted by a researcher, it is the crucial role of GIS in land-use suitability analysis has changed within the parameters of the changing perspectives of planning from scientific approaches by means of the political process-oriented perspectives and a central view on communication to collective-design approaches [16]. GIS albeit limited studies has been centralized on the main visualization and representation which is focused on seeing the world as composed of geographic layers containing objects (lines, pixels, polygons, and points) together with associated characteristics.

GIS as a technological tool also brought some advancement yet there are also attached concerns among the users. Amon these are the ethical standards and numerous concerns from the social institutions for their adoption and land-use process. Some of these have resulted in moral dilemmas which can be traced to the issues of accessibility, accuracy, accountability, and shared responsibility [17].

Hence, the land use data presented here could warrant a good source of information not only for the environmental planners of this town under study but for the university in setting the component of GIS in the engineering services offered and planning these appropriately to the intended clientele.

And considerably Table 4 provided the data that the training respondents appreciated, valued, and appraised EPANET software as a good tool with 58.33%, particularly in all areas except for *Water demands* and *Water Supply.* By utilizing EPANET, the occurrence of problems such as the water supply system's frequent damage and failures due to improper maintenance in case of repairs and leakages be avoided.

What make this interesting is that EPANET is designed to be a research tool for improving people's conception and understanding of the movement and the determination of drinking water constituents within distribution systems [18].

Table 3. Respondents' technical skills – before and after the training (EPANET)

EPANET		
SKILLS	Percentage	
	Before	After
S1. Introduce to EPANET	8.33 %	58.33 %
S2. Prepare Datasets	8.33 %	58.33 %
S3. Know water demand concepts	16.67 %	50.00 %
S4. Determine Water supply system estimation and storage	33.33 %	50.00 %
S5. Appreciate Design standards	16.67 %	58.33 %
S6. Know Hydraulic Model Parameters	16.67 %	58.33 %
S7. Create Hydraulic Model	16.67 %	58.33 %
S8. Appreciate Hydraulic Model	8.33 %	58.33 %
S9. Appraise Model Quality checking and evaluation	8.33 %	58.33 %
S10. Present Future plans for evaluation	0.00 %	58.33 %

In this aspect, EPANET can be a useful tool among local government officials particularly those involved in the engineering and water design for the various kinds of applications in distribution systems analysis. Among others, the Alubijid stakeholders can have hydraulic model calibration, chlorine residual analysis, sampling program design, and in the conduct of relevant consumer exposure assessment. Noteworthy also is the inclusion of the assessment of the alternative management strategies for improving water quality throughout a system, which can be beneficial to the growing economic town of Alubijid, which is strategically located in Misamis, Oriental, Philippines.

The derived data on EPANET would give an interesting addition to a wide array of services that the engineering faculty and staff of the university can extend to the local community. These data may be crucial in determining not only distribution systems but that of extended period simulation of hydraulic and water quality behavior analysis. Community partners could also learn to tap experts coming from the academe especially if they are incapable of doing this due to specialists as in the case of Alubijid town in this study.

5. CONCLUSIONS & RECOMMENDATIONS

In this study, the determination of the impact of a technical training program aimed to equip the participants of engineering know-how was evaluated. This was done at establishing the acquisition of knowledge and skills attained by the training respondents after the technical training given by the university in its community and extension services.

Results revealed that LGU employees were able to appreciate and learn from this engineering technical training accorded to them. These have been introduced and oriented to the software and they were able to execute important tasks in relation to geotagging, GIS, and EPANET software applications.

For the record, some have claimed that they have not applied these applications in their present jobs due to lack of equipment or software. It is also suggested that the local government unit under study should conduct more technical training to ensure continuity and transfer of skills to their employees and in order to achieve this investment in buying relevant equipment and facilities catering to geotagging, GIS, and EPANET software applications so that concerned employees' skills and knowledge will be maximized with their hands-on and ensuring practice have ensued.

The salient findings of this study purport to the vital points, including the prudent planning, organizing, and leading of appropriate community and extension services of the university.

These matters should not be left behind to the office of the Extension and Community Relations only but with close coordination with the stakeholders and/or concerning beneficiaries of the intended project. There were points discovered that should be planning and organizing process like that of area specifications which were not developed for textual descriptions of specimen location, geographical assessment in the selection of areas for town planning; inclusion of the assessment of the alternative management strategies for improving water quality throughout a system, and in the extended period simulation of hydraulic and water quality behavior analysis.

These derived data would mean a careful deliberation of community and extension services of the university. On the other hand, community partners or beneficiaries have recognized the crucial contributions of the university in the process of knowledge transfer and management. They also realized that tapping the university services would adequately train them on the concepts, skills, and strategies that they need in the workplace. It should be noted that at the conclusion of the training, these target respondents did not get any other engineering-related training given by the university or any other institutions. And environmental planners would benefit from this study for careful deliberation among others of land use, and planning of sustainable economic and regional, and urban planning.

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