

## **Outcomes from Participation in Automotive Servicing and Troubleshooting Training Program Among Lantapan Beneficiaries**

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### **Abstract**

The Basic Automotive Servicing and Troubleshooting Training Program, conducted by Bukidnon State University in collaboration with the local government of Lantapan, aimed to enhance the technical skills and employability of the local youth. This program, part of a broader initiative to promote sustainable development and poverty reduction, included three sessions between September and November 2023. Using a theory of change framework, the study evaluated the program's impact on participants' knowledge and skills. Pretest and post-test analyses revealed significant improvements in technical proficiency, as evidenced by the ANOVA results showing a notable increase in test scores from an average of 7 to 11.16. A qualitative method assisted in the analysis of the outcomes of the training. Participants demonstrated enhanced abilities in engine management system activities, with marked improvements in both pre-scanning and post-

scanning processes. The training program not only provided practical automotive skills but also fostered personal and professional growth, preparing participants for future career opportunities. This study underscores the critical role of targeted vocational training programs in community development and capacity building.

**Keywords:** *Automotive, troubleshooting, outcomes*

## Introduction

The Extension Program from Bukidnon State University, targeted at empowering Lantapan communities through Livelihood and Technology for Sustainable Development, has been a beacon of hope in providing essential livelihood programs. Specifically, the Automotive Servicing and Troubleshooting Program, aimed at School Youth, Adults, and the SK Federation of the municipality, was conducted over three sessions between September and November 2023, culminating on November 29, 2023. This initiative is part of a larger effort to stimulate positive, sustainable development at the local level.

Following the Asian financial crisis, there has been a notable recovery in the Philippine car industry, although its performance pales in comparison to the global stage, especially against the backdrop of the flourishing service industry in the world's advanced economic systems, which employs a significant majority of the workforce (Quimba & Rosellon, 2012; Velimirovic & Duboka, 2016).

Extension services, considered the "third mission" of higher education institutions, play a crucial role in allowing universities and their staff to impart specialized knowledge beyond the confines of their campuses. The impact of these services, which include areas such as computer literacy, health education, and livelihood programs, has been highly satisfactory, showcasing positive social and economic repercussions (Sermona et al., 2020; Salazar, 2020).

A pivotal partnership formed between the local government of Lantapan and Bukidnon State University, sealed by a Memorandum of Agreement, underscored the joint commitment to conducting a needs assessment survey. This collaboration birthed the Livelihood and Technology Training program, with Automotive Servicing and Troubleshooting being a key component. The overarching goal lies in fostering sustainable livelihood training aimed at poverty reduction, enhancing local capabilities, and generating new opportunities for the impoverished while grooming a globally competitive workforce in Lantapan, Bukidnon.

Notwithstanding the success in delivering the training to its intended recipients, an evaluative lens is necessary to truly gauge the project's impact on the community. As highlighted by Franz (2013), evaluating the outcomes of university extension programs is pivotal in assessing their efficacy in meeting educational and developmental objectives. These evaluations not only shine a light on the program's strengths and areas needing improvement but also serve to augment the quality and effectiveness of the services rendered. There is an articulated desire within the University to delve into the outcomes produced by the extension program for its beneficiaries, prompting a study to unearth the tangible results yielded by the Basic Automotive and Troubleshooting Services Program's training.

## Framework of the Study

A valuable tool for explaining and illuminating social policies or program activities results and impacts is the theory of change (ToC). The ToC was created by renowned expert in policy studies and program assessment, Carol Weiss, as a potent technique for comprehending how programs result in desired outcomes. Weiss work had a significant impact on social transformation and program evaluation.

Figure 1  
*Theory of Change Model*



Community resources are referred to as the input phase in the ToCo Both tangible and intangible assets, such as money, people, buildings, machinery, and information, are considered resources. Program activities are built upon resources. Activities refer to the particular measures that the program has taken to bring about change. They convert resources into deliverables or final products. The end products of a program are its outputs. They serve as an example of the outputs of the program (training sessions held, materials given, etc.). The changes that arise from program activities are known as outcomes. They show changes in conditions, attitudes, or behavior.

### Objectives

This study aimed to determine the outcomes of participation in the Basic Automotive Servicing and Troubleshooting Training Program among Lantapan Beneficiaries. Specifically, this study aimed to:

1. Assess the effects of the Basic Automotive Servicing and Troubleshooting Training Program on Lantapan beneficiaries' knowledge and skills
2. Determine the outcomes experienced by the Lantapan beneficiaries because of their participation in the Basic Automotive Servicing and Troubleshooting Training Program.
3. Identify the Strengths, Weaknesses, Opportunities, and Threats of the Basic Automotive Servicing and Troubleshooting Training Program

### Methodology

#### A. Research Design

The study employed a mixed-method research design. It uses philosophical presumptions in which it gathers and analyzes data from multiple sources in a single study (Dawadi & Giri, 2021). According to Shorten and Smith (2017), mixed methods research integrates qualitative and quantitative research components, yielding more comprehensive findings compared to either approach used alone. Specifically, it followed the exploratory sequential design type of mixed methodology. This method begins with the analysis of quantitative data collected using pretest and post-test and then follows up with qualitative data collection. This helps determine what quantitative results need further explanation.

## B. Data Collection Procedure

The first phase of the study used quantitative data collection. At this point, a structured questionnaire was developed to quantify the participant's knowledge of basic automotive servicing and troubleshooting. During the pretest, the researchers administered the questionnaire to all beneficiaries (N=32) to establish baseline data. After implementing the program through lecture series and hands-on activities, post-tests (N=32) were given. The participants are from the school youth and adults and members of the SK federation in Lantapan, Bukidnon. After gathering quantitative data, the researchers analyzed information and identified specific results that need more investigation. Qualitative data collection was employed for phase two of the study. A semi-structured interview guide was developed to explore the participants' experienced outcomes from their participation in the Basic Automotive Servicing and Troubleshooting Training Program. The interview guide was first written in English language and then translated into Cebuano language; the language spoken by the informants. The study samples were identified using purposive sampling. Purposive or purposeful sampling is a type of non-probability sampling technique employed to select the best sources of data to meet the purpose of the study (Douglas, 2022). The participants were recruited from the complete sample frame using the following criteria: 1) they are the recipients who have completed the Basic Automotive Servicing and Troubleshooting Training Program from Lantapan, Bukidnon; 2) these recipients were able to attend the three training sessions, and 3) they must be willing to have their ideas documented.

To be cost-efficient, data were gathered through asynchronized personal interviews on Facebook group chat with the seven beneficiaries. In-depth questions included the most significant change they experienced after attending and their perceived strengths, weaknesses, opportunities, and threats of the program.

## C. Data Analysis

The quantitative data was coded, classified, quantified, tabulated, and analyzed. Statistical tools that were used in the study include the following: (1) descriptive statistics such as frequencies, percentages, means, standard deviations, and ranges were used to assess the effects of the Basic Automotive Servicing and Troubleshooting Training Program on Lantapan beneficiaries' knowledge and skills; and (2) ANOVA test was used to compare pretest and post-test results. Comparing measurements made before and after the treatment is given enables more proof of the intervention's efficacy (Zach, 2020).

Furthermore, the qualitative data was encoded and transcribed. Moreover, when the target participants used the vernacular language, the researchers translated it into English language. After transcribing, it was further subjected to thematic analysis. Thematic analysis, according to Aronson (1992), focuses on identifiable themes and patterns of living and/or behavior. Thematic analysis is a widely used method in qualitative research (Braun & Clarke, 2019), which usually comprises thick descriptive data (Naaem et al, 2023). The responses were coded manually and inductively by the first author. Throughout the coding process, the co-authors were updated and consulted through a series of meetings on the significant themes that emerged from the responses.

Also, SWOT analysis was utilized to assess strengths, weaknesses, opportunities, and threats in order to have a better understanding of what is causing these problems that

occurred at the program level. It is a strategic planning technique that provides a framework for identifying and analyzing the internal and external factors that can impact the viability of a project, product, or business. (Gürel, 2017).

Bennett's hierarchy of program outcomes (Table 1) was used to determine the levels of program outcomes further. Bowen and Radhakrishna (2010) determined that ascending the hierarchy indicates stronger evidence of program impact. Each significant change that was narrated by the respondents was classified by its theme.

Table 1

*Bennett's Hierarchy of Program Outcomes Framework*

Level	Description
7	Project outcome—effect to the community
6	Change in project cooperator' behavior and practices
5	Changes in knowledge, attitude, skill, aspiration
4	Changes in project cooperators' opinion/reaction to different activities
3	Community involvement of residents and local authorities
2	Activities—meetings, seminars or trainings, different services provided
1	Program resources—staff time, funds

#### D. Participants and Sampling Procedure

The study included 32 beneficiaries of the Basic Automotive Servicing and Troubleshooting Training Program. The participants were from the school youth, adults, the SK federation in Lantapan, Bukidnon.

The study samples were identified using purposive sampling. The participants in this study were recruited using the following criteria: 1) they were the recipients who have completed the Basic Automotive Servicing and Troubleshooting Training Program from Lantapan, Bukidnon; 2) these recipients were able to attend the three training sessions, and 3) they must be willing to have their ideas documented.

Further, the researchers randomly selected participants from those who met the inclusion criteria to reduce selection bias and increase representativeness. This ensured that every participant meeting the criteria had an equal chance of being selected.

#### E. Ethics Statement

All procedures performed in the study involving human participants adhered to the ethical standards of the institutional and national research committee and with the Philippine Health Research and Ethics Board regulations. Free, prior, and informed consent was obtained from all individual participants involved in the study. The researchers assured the interviewees of confidentiality and anonymity. Any potentially identifying information was handled confidentially to protect their privacy.

## Results and Discussions

The results and discussion section presented and interpreted the findings of the study, focusing on the outcomes from participation in Basic Automotive Servicing and Troubleshooting Training Program among the Lantapan beneficiaries. The discussion contextualizes these findings within existing literature, addressing the study’s implications, limitations, and suggestions for future research. This section aimed to provide a comprehensive understanding of the intervention’s practical significance and its potential broader applications.

### Assess the Effects of the Basic Automotive Servicing and Troubleshooting Training Program on Lantapan Beneficiaries’ Knowledge and Skills

The ANOVA analysis compared the pre-test and post-test scores, each with 32 observations. The pre-test scores have an average of 7 with a variance of approximately 6.90, while the post-test scores have a higher average of 11.16 and a slightly lower variance of 6.27. The ANOVA results reveal a significant difference between the two sets of scores, as indicated by an F-statistic of approximately 41.98, which exceeds the critical value of 3.996, and an extremely low p-value of around 1.70e-08.

The small P-value (1.70E-09) indicates that the difference between the group means is statistically significant at a certain level of significance. Since the P-value is much smaller than the typical threshold of 0.05, it can be concluded that there is a significant difference between the two groups being compared. The large F-statistic (41.97803) compared to the F-critical value (3.995887) also supports the conclusion that the difference between the group means is statistically significant.

Table 2  
*Pre-test and Post-test ANOVA Results*

SUMMARY						
GROUPS	Count	Sum	Average	Variance		
Pre-test Scores	32	224	7	6.903226		
Post-test Scores	32	357	11.15625	6.265121		

  

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	276.3906	1	276.3906	41.97803	1.70E-08	3.995887
Within Groups	408.2188	62	6.584173			
Total	684.6094	63				

Diagnosing engine issues using an OBD-II scanner is crucial for efficient repairs. The training has provided checklists to monitor the skills of the beneficiaries. The Pre-Scanning Preparation phase is a critical component of effective engine diagnostics. With an average passing rate of 72%, this stage involves meticulous groundwork before initiating the diagnostic process. Key considerations include gathering relevant information about the vehicle, such as its history, recent repairs, and observed symptoms. By comprehensively understanding the problem, technicians can streamline subsequent steps, ensuring a more efficient and accurate scanning process. The thoroughness of this preparatory phase significantly impacts the overall diagnostic outcome, making it an essential focus area for automotive professionals.

The scanning process, with an average passing rate and an average rating of 81%, involves the use of an OBD-II scanner. During scanning, this diagnostic tool communicates directly with the vehicle’s onboard computer to retrieve trouble codes (DTCs). These codes offer valuable insights into specific issues affecting critical systems such as the engine, transmission, and emissions. Proper interpretation of DTCs is essential for accurate diagnosis and effective troubleshooting.

Majority of the recipients passed the Post-Scanning Process with the Average passing rate of 89%. After obtaining DTCs, the next step is to identify the root cause of the problem. This involves analyzing sensor data, checking wiring connections, and inspecting relevant components. Once the issue is pinpointed, you can proceed with repairs. Clearing the fault codes ensures that the check engine light won’t reappear if the problem is resolved.

During this training session, 81% of the recipients demonstrated significant learning through practical exercises. While the remaining 19% require further improvement, the overall results remain positive.

Table 3  
*Participants’ Summary of Rating on Engine Management System Activity*

Performance Indicator	Yes		No	
	f	%	f	%
<b>Pre-Scanning Preparation</b>				
1. The participants verify the engine type and model	25	78%	7	22%
2. The participants gather all the tools and equipment needed for the activity	24	75%	8	25%
3. The participants wear personal protective equipment	23	72%	9	28%
4. The participants visually inspect the obvious sign of damage, wear, loose connection, and disconnected components.	22	69%	10	31%
Average		72%		28%
<b>Scanning Process</b>				
5. The participants Identify the location of OBD-II port	25	78%	7	22%
6. The participants properly connect the scanner to the diagnostic port	26	81%	6	19%
7. The participants turns on the engine without scanning	27	84%	5	16%
8. The participants successfully establish the connection between ECU and scanner	28	88%	4	13%
8. The participants read the current, pending, and permanent fault code	24	75%	8	25%
9. The participants determine the faulty engine sensors	25	78%	7	22%
10. The participants perform the repair and sensor cleaning	28	88%	4	13%
11. The participants successfully clear the fault codes	24	75%	8	25%
Average		81%		19%
<b>Post- Scanning Process</b>				
12. The participants start the engine and successfully clear the check engine lights	29	91%	3	9%
13. The participant disconnect the scanner properly	30	94%	2	6%
14. The participants clean the working area	28	88%	4	13%
15. The participants clean the scanner and store it properly	27	84%	5	16%
Average		89%		11%

In the context of the Extension Project aimed at empowering communities through livelihood and technology for sustainable development, the performance metrics related to materials preparation was evaluated. In the Pre-Performance (Average Materials Preparation) there is a passing rate of an average of 84%. 84% of participants met the expected standards, while 16% fell short. This initial assessment provides a solid foundation.

The Implementation (Actual Performance) had a passing average of 84%. During the implementation phase, 84% maintained the expected level, but 17% did not meet the desired standards. Identifying areas of improvement is crucial here. In the Post-Performance (After Implementation) there was a passing average of 90%. Encouragingly, post-implementation performance improved significantly, with 90% achieving the desired outcome. Only 11% required further improvement.

The second training session demonstrated significant progress in practical monitoring and evaluation, achieving an impressive average score of 86%. However, there remained room for improvement, as 14% of the recipients still required further attention.

Table 4  
*Participants' Summary of Ratings on Electrical System Circuit Connection Activity*

Performance Indicator	YES		NO	
	f	%	f	%
<b>Materials Preparation</b>				
1. The participants prepare the necessary tools and safety equipment needed in the activity	27	84%	5	16%
2. The participants inspect the tools and equipment are in good condition	25	78%	7	22%
3. The participants wear personal protective equipment	29	91%	3	9%
Average		84%		16%
<b>Actual Performance</b>				
4. The participants visually check the condition of electrical components	26	81%	6	19%
5. The participants check the battery voltage	23	72%	9	28%
6. The participants disconnect the battery terminal before they start the actual activity	28	88%	4	13%
7. The participants successfully perform park light circuit	29	91%	3	9%
8. The participants successfully perform headlight circuit	24	75%	8	25%
9. The participants successfully perform signal light circuit	28	88%	4	13%
10. The participants successfully perform hazard light circuit	29	91%	3	9%
11. The participants successfully perform horn circuit	30	94%	2	6%
12. The participants successfully perform brake light circuit	24	75%	8	25%
13. The participants successfully perform reverse light circuit	26	81%	6	19%
Average		84%		17%
<b>Post- Performance</b>				
14. The participants clean up the tools after using and place in the proper area	28	88%	4	13%
15. The participant disconnect the battery	29	91%	3	9%
Average		90%		11%

The analysis of material preparation checklists revealed that the majority of recipients successfully completed the practical exercise, achieving an 80% pass rate. However, attention to personal clothing preparation received less focus, as seven participants made errors in this area.

During the actual performance, most recipients excelled in the monitoring and evaluation exercise, achieving an impressive 86% success rate. Although some participants initially found the activity challenging, corrective measures were implemented during the evaluation process. Notably, eight recipients encountered difficulties in troubleshooting and repairing motorcycle ignition systems.

Post-performance evaluation further substantiates positive outcomes, with an average passing rate of 85%. Overall, participants demonstrated commendable progress, emphasizing the effectiveness of the training program. The targeted focus on troubleshooting and analyzing motorcycle electrical system circuit connections appears to have yielded favorable results.

Table 5  
*Participants' Summary of Ratings on Motorcycle Electrical System*

Performance Indicator	Yes		No	
	f	%	f	%
<b>Materials Preparation</b>				
1. The participants prepare the necessary tools and safety equipment needed in the activity	28	88%	4	13%
2. The participants inspect the tools and equipment are in good condition	26	81%	6	19%
3. The participants wear personal protective equipment	25	78%	7	22%
Average		80%		20%
<b>Actual Performance</b>				
4. The participants visually check the condition of electrical components	29	91%	3	9%
5. The participants check the battery voltage	30	94%	2	6%
6. The participants disconnect the motorcycle battery terminal before they start the actual activity	29	91%	3	9%
7. The participants successfully troubleshoot and repair motorcycle charging system	29	91%	3	9%
8. The participants successfully troubleshoot and repair motorcycle ignition system	24	75%	8	25%
9. The participants successfully troubleshoot and repair motorcycle lighting system	26	81%	6	19%
10. The participants successfully troubleshoot and repair motorcycle horn system	28	88%	4	13%
11. The participants successfully perform horn circuit	27	84%	5	16%
12. The participants successfully perform carburetor cleaning	29	91%	3	9%
13. The participants successfully perform motorcycle performance testing	25	78%	7	22%
Average		86%		14%
<b>Post- Performance</b>				
14. The participants clean up the tools after using and place in the proper area	25	78%	7	22%
15. The participant clean up the working area the activity.	29	91%	3	9%
Average		85%		15%

During the Material Preparation, 80% of the beneficiaries were able to understand and identify the materials. For the actual performance, 86% of the participants passed, while post-performance, only 15% needed more coaching.

It is evident from the results that participants, before taking the training program, had little knowledge and experience in basic automotive practices. Significant differences from the pretest to the post-test have proved that participation in automotive servicing and troubleshooting training programs has enhanced their capacity. To support such results, a study by Bogdan (2016) from a similar field stated that acquired learning from training experiences can greatly contribute to automotive educational and practical objectives. Moreover, the study of Zondo (2019) denotes that relevant training programs significantly improved automotive parts manufacturing in South Africa using the Training and Assessment Register (TAR) to prove that skills and knowledge of research participants to become specialists in their work areas.

### Determine the Outcomes Experienced by the Lantapan Beneficiaries from Their Participating in the Basic Automotive Servicing and Troubleshooting Training Program

#### Levels of Project Outcome

The levels of the Basic Automotive Servicing and Troubleshooting Training Program were determined through Bennett’s Hierarchy of Program Outcomes. Each noteworthy change reported by the beneficiaries was categorized according to its theme. From the significant changes identified by the participants, the program has already achieved effects that aligned with higher levels of outcomes, specifically Levels 5 and 6. Therefore, the beneficiaries have experienced significant changes in their skills and practices (Level 5) and economic change.

Table 6  
*Levels of Basic Automotive Servicing and Troubleshooting Training Program Outcomes*

Level of Outcomes	Themes of Change	Description
5-Change in skills, aspirations and practices	Enhance capability in repairing its own vehicle	Majority of the informants were able to repair its own motorcycle because of the training
	Increased level of confidence	An informant said that because of this training he is no longer scared of fixing his own vehicle
6-Economic change	Employment	The program has helped the participants in finding a source of income that can meet their family’s needs
	New revenue stream	Additional side hustle is one of the positive narratives of the participants

#### Change in Skills, Aspirations and Practices

**Enhanced capability in repairing its own vehicle.** Majority of the informants were able to repair their own motorcycle because of the training. Some of the responses are the following:

*“Dakoa kaayu og kabag.ohan sa akong na ton.an sa automotive servicing, sa pagau nako daku kayo kog advantage sa mga makina.”* [I gained in automotive servicing. It greatly benefits me from working with machines.]

*“...naka toun kos mga sensor og unsaon pag hinlo unsaon pag trouble code tas labi na and wiring dako kaau ug tabang sa akoa kay gaka gamit nananko sa akong unit iwas na sa gasto sa electricians maka save na”* [I learned how to handle sensors, troubleshoot issues, and work with wiring. This knowledge has been incredibly helpful for maintaining my own unit and avoiding unnecessary expenses on electricians.]

*“Sukad na apil ako ana na proyekto ako na mismo ang ga ayo sa mga wiring sa akong motor especially sa pagtaud sa mga suga sa motor especially sa pagtaod sa mga suga sa motor”* [I have actively used my learning in wiring my own motorcycle, particularly when it comes to installing lights]

**Increased level of confidence.** An informant said that because of this training he is no longer scared of fixing his own vehicle. He said that:

*“Ang kabag.ohan sa akong kinabuhi tungod sa actibidad sa automotive kay mas confident nako mag ayo ayo ug sakyanan dili na usab ako mahadlok og kobi sa mga sensor”* [The improvement in my life due to my involvement in automotive activities is remarkable. I now feel more confident in handling vehicles, and I no longer fear dealing with sensors]

## Economic Change

**Employment.** The program has helped the participants in finding a source of income that can meet their family’s needs. Some responses are the following:

*“...tungod niini nagkatrabaho ko sa usa ka repair shop diri sa among dapit, ug maka sideline na usab ako para itabang sa akong pamilya unta naa pay uban nga mga training sama niini.”* [As a result, I now work at a repair shop in our area and can also take on side jobs to support my family. I hope there will be more training opportunities like this.]

*“tungod sa training sa automotive nakakita nako og trabaho og naana sab gaparepair sa akoa.”* [I found work, and there are also repair jobs available for me.]

*“dako kayo ko og pasalamat sa training kay mas nadugangan dakong kita kay naka mao naman ko mag repair sa mga basic nga daot sa sakyanan og motor.”* [I’m immensely grateful for the training because it has significantly increased my income. Now, I can handle basic repairs for both cars and motorcycles.]

**New revenue stream.** Additional income is one of the positive narratives of the participants. One participant said that:

“Mas nadugangan pud an akong income kay naa naman magpa repair sa ako salamat kaayo nilang sir sa pagtudlo kanamao.” [my income has increased because people come to me for repairs. Many thanks to you and Sir for imparting your knowledge to us.]

To sum up, the Basic Automotive Servicing and Troubleshooting Training Program has had a noteworthy impact on a range of outcomes. Participants’ abilities to fix their own vehicles have significantly improved as a result of the program; most have reported feeling more competent and confident. By generating jobs and new revenue streams, this change not only gave people the ability to repair their vehicles on their own but also made a real impact on the economy. Numerous participants have effectively utilized their recently learned abilities to produce revenue that sustains their families, highlighting the program’s efficacy in promoting the development of practical skills and economic empowerment among its beneficiaries.

## **Identify the Strengths, Weaknesses, Opportunities and Strengths of the Basic Automotive Servicing and Troubleshooting Training Program**

### **Strengths**

**High-quality training and teaching methods.** Most of the participants revealed that the program provided by the automotive technology department was given to the participants with high quality training and teaching methods and that they have acquired learning through the series of training sessions. Some of the responses are the following:

*“Thank you for giving us time to learn. Continue teaching so that the community could be helped.”*

*“It’s really good because I learned something.”*

*“Everything said was correct and I learned a lot that can be used in any situation.”*

The statements coming from the participants of the training program shows that they have received quality instruction from their trainers. Because of the quality of instruction given, they were able to say that they had learned and desired that the program should be continued to help others. The respondents’ statements confirm the study of Blume et al. (2010), saying that the correct conduct of training is a key predictor of successful skill acquisition and application. Also, well-implemented training programs lead to significant improvements in skill development. This implies that training effectiveness is enhanced by aligning training content with job requirements and providing opportunities for practice (Aguinis & Kraiger, 2009).

**Provision of practical skills and knowledge.** Most of the participants said that the program has provided them with practical skills and knowledge. Some of the responses are the following:

*I am very thankful because I was also able to learn about vehicle and motorcycle accessories*

*It's a big help and adds to my knowledge. It provides additional knowledge about vehicle sensors."*

These statements confirm Saks and Belcourt (2006) finding that incorporating practical application in training programs enhances the transfer of learning. This approach helps participants to better understand and apply new knowledge and skills in real-world scenarios. Kolb and Kolb (2005) also discussed the effectiveness of learning through experience. Training that involves real-life tasks, simulations, and hands-on activities significantly boosts participants' practical skills. The statements coming from the trainees are manifestations of the knowledge and skills that they have learned during the training program.

**Free education and resources.** Majority of the participants were grateful for the free training and resources on automotive servicing. Some of the responses are the following:

*"Thank you also for teaching us for free."*

McGuinness et al. (2019) highlight that free training programs significantly increase access to education and skill development opportunities, especially for individuals from low-income backgrounds. This access can lead to better job prospects and economic mobility. Also, free education initiatives promote social equity by providing opportunities for all individuals, regardless of their socio-economic status, to acquire essential skills and knowledge. This leads to greater social inclusion and cohesion (Marginson, 2016).

**Enthusiastic and knowledgeable staff.** Some informants revealed that the program has enthusiastic and knowledgeable staff. Some of the responses are the following:

*The teachers are very good especially in answering our questions. May there be more trainings like this one.*

*There are many competencies that can be learned here because it's nice and better when teachers teach here."*

Table 7  
*Participants' Perceived Strengths from the Program*

Themes	Description
High-quality training and teaching methods	The informants reported that the program has provided them with high quality training and teaching methods
Provision of practical skills and knowledge	Most of the participants said that the program has provided them with practical skills and knowledge
Free education and resources	Majority of the participants are grateful for the free training and resources on automotive servicing
Enthusiastic and knowledgeable staff	Some informants revealed that the program has enthusiastic and knowledgeable staff

A review given by Salas et al. (2012) confirms that both the enthusiasm and knowledge of trainers are key factors in successful training programs. These traits contribute to creating a positive learning atmosphere and ensuring that complex concepts are clearly communicated and understood. Moreover, trainer enthusiasm significantly enhances learner engagement and motivation. Enthusiastic trainers create a more dynamic and interactive learning environment, which improves knowledge retention (Patrick et al., 2000). Blume et al. (2010) also stated that trainers who are both enthusiastic and knowledgeable significantly enhance learning outcomes. Their ability to engage learners and provide deep insights into the content helps learners to better grasp and apply new skills.

### Weakness

**Desire for more classes or advanced levels, suggesting a limitation in current offerings.** An informant said that NC II is necessary to be used for formal employment or further education. According to informant:

*“Does this have NC II?”*

Table 8  
*Participants’ Perceived Weakness of the Program*

Themes	Description
Desire for more classes or advanced levels, suggesting a limitation in current offerings.	An informant said that NC II is necessary to be used for formal employment or further education

The desire for more classes or advanced levels after completing a training series indicates a limitation in the current offerings and a strong demand for continued learning opportunities. Noe et al. (2014) note that trainees often express a desire for more advanced training opportunities after completing initial training programs. This desire reflects the need for ongoing skill development to keep pace with changing job requirements. This was also confirmed by Loon and Bell (2015), who said that many trainees seek more advanced training opportunities to stay competitive in their fields. This demand underscores the gap between the basic training provided and the advanced skills needed for career advancement. Also, trainees express a desire for more specialized and advanced training to address these gaps and enhance their career prospects (Aguinis & Kraiger, 2009).

### Opportunities

**Expansion of training programs to reach more individuals.** A beneficiary mentioned that training should aim to enhance accessibility and empower a larger audience through educational development. Some of the responses are the following:

*“It’s good that there is this training because for people like us who no longer go to school, we can continue learning.”*

*“The teachers are very good especially in answering our questions. May there be more trainings like this one.”*

The respondents have expressed the need for more training for skills development. This is confirmed by McKinney and Hagedorn (2017), who said that community and technical colleges are expanding their free training offerings. Their study finds that such expansions significantly increase educational access and job placement rates for underserved communities. Barrow and Rouse (2020) have also enumerated how to expand the offering of free training programs. These are through funding scholarships, providing online training resources, and partnering with educational institutions to offer free courses.

**Development of advanced training levels.** A participant emphasizes that there are a lot of skills that could be learned with the help of experts coming from different agencies. Some of the responses are the following:

*“Many learned especially in sensor testing and engine check-up. Hopefully, TESDA can help many more.”*

Hašková (2022) expressed that there is a need to ensure adequate automotive training of individuals practicing in the field of automotive and troubleshooting. Also, the study of Noe and Dachner (2010) indicates that initial free training programs often serve as a foundation, encouraging participants to pursue more advanced levels of training. This progression helps individuals build on their skills and achieve higher qualifications. Moreso, participants who complete free training programs are more likely to pursue advanced training and certification. This leads to skill enhancement and greater professional growth, improving their employability and career prospects (Kyndt et al., 2011).

**Potential to aid community development through technology transfer.** The training program effectively facilitates community development by equipping locales with both the technology and the necessary skills to utilize it. Here are some of the responses:

*“A good opportunity for the development of us all.”*

*“It is good to provide and teach technologies in towns so they can be used.”*

Table 9  
*Participants’ Perceived Opportunities from the Program*

Themes	Description
Expansion of training programs to reach more individuals.	A beneficiary mentioned that training should aim to enhance accessibility and empower a larger audience through educational development.
Development of advanced training levels.	A participant emphasizes that there are a lot of skills that could be learned with the help of experts coming from different agencies
Potential to aid community development through technology transfer.	The training program effectively facilitates community development by equipping locales with both the technology and the necessary skills to utilize it.

Respondents have noted that the training program they have undergone is a big opportunity for community development utilization. This is also noted by Autio and Thomas (2014), who said that a series of training programs promote innovation and entrepreneurship in communities. By equipping individuals with the necessary skills and knowledge, these programs foster a culture of innovation and support the development of new ventures. Romijn and Albaladejo (2002) have also stated that training programs can enhance the technological capabilities of local communities. These programs help in building local expertise and promoting sustainable development. Moreover, Halili (2020) reported that technology transfer facilitated by automotive training helps organizations thrive towards innovation and process enhancements. Hence, the provision of skills and knowledge is relevant to the development of participants.

## Threat

**There is a need for continuous funding or support to maintain free education.** An informant said that the program has to continue providing more training on sustainability. He said that:

*“I hope there will be more programs like this in the future.”*

Table 10

*Participants' Perceived Threat of the program*

Themes	Description
The need for continuous funding or support to maintain free training courses	An informant said that it would be good if there will be more free training programs has for sustainability

In order to continue offering a series of free training programs, financial support and resources need to be considered. They are essential in carrying out this thrust. Boeren (2016) also noted this concern. He discusses the challenges that arise from inconsistent funding. Without reliable financial support, free training programs may face disruptions that hinder participant outcomes and program effectiveness. A suggestion comes from Barr (2004), who says that the government and private sectors can be involved in funding free training programs. His study suggests that a combination of public and private funding sources can help to stabilize and expand training initiatives.

## Conclusions and Recommendations

The study aimed to assess the effects of the Basic Automotive Servicing and Troubleshooting Training Program on Lantapan beneficiaries' knowledge and skills and determine the outcomes experienced by the beneficiaries after their participation in the said program. Results show that there is a positive effect on the knowledge and skills of the Lantapan beneficiaries because of their participation in the Basic Automotive Servicing and Troubleshooting Training Program. The training post-test and the summary of ratings showed that there is an increase in the beneficiaries' knowledge and capabilities in relation to basic automotive and troubleshooting. The participants also recorded positive outcomes after the training, such as changes in skills, aspirations and practices, and economics. The training enabled them to have enhanced capability in repairing

their own vehicles, increased their level of confidence in doing automotive work and helped the participants in finding sources of income that could meet their family's needs.

Moreover, the participants agree that high-quality training and teaching methods, provision of practical skills and knowledge, free education and resources, and enthusiastic and knowledgeable staff all lead to the achievement of the program's goals and objectives. This is also evident in the participants' remarks about their desire for more classes or advanced levels, the expansion of training programs to reach more individuals, the development of advanced training levels, and the potential to aid community development through technology transfer.

In general, the Basic Automotive and Troubleshooting Training Program has been a transformative experience, marked by both highs and lows that have shaped its success. Throughout the program, the participants embarked on a journey of discovery, gaining fundamental knowledge of automotive systems and honing their troubleshooting skills. Hands-on experiences and drills provided by the trainers gave invaluable lessons, fostering confidence and competence among the trainees. The program's structured approach ensured a comprehensive understanding of vehicle mechanics, empowering participants to tackle challenges with practical solutions. The program's impact extends beyond technical proficiency and encompasses personal and professional development, laying a foundation for lifelong learning and career advancement.

### Scope and Limitations

While the study provides valuable insights into the effectiveness of the basic Automotive Servicing and Troubleshooting Training Program, it also has certain limitations that must be considered:

1. **Sample Size and Generalizability:** The Study focuses on a specific group of beneficiaries from Lantapan. The findings may not be generalizable to other regions or populations with different socio-economic backgrounds or educational levels.
2. **Self-Reported Data:** The outcomes and improvements in knowledge and skills are based on self-reported data from the participants. There may be biases or inaccuracies in their responses, affecting the reliability of the results.
3. **Short-Term Assessment:** The study primarily evaluates the immediate affects of the training program. Long-term impacts on the participants' career, income stability, and sustained use of acquired skills are not addressed.

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