

# EVALUATION OF ACCEPTABILITY OF THE PART-TIME FOUR-WHEEL DRIVE SAFETY DEVICE; AS AN INSTRUCTIONAL TOOL IN THE AUTOTRONICS PROGRAM

John Paul S. Duyaguit<sup>1</sup>, John Philip Soler<sup>2</sup>, Lourd Vincent B. Tunday<sup>3</sup>, Lourence Aboc<sup>4</sup>, Joe Vane N. Antifuesto<sup>5</sup>

College of Science and Technology Education, University of Science and Technology of Southern Philippines,  
C.M. Recto Ave., Lapasan, Cagayan de Oro City 9000

\*Correspondence Tel.: +63 956 471 1188, \*E-mail: [johnpaulduyaguit19@gmail.com](mailto:johnpaulduyaguit19@gmail.com)

**ABSTRACT** - The Autotronics program was previously known as BS Mechanical Automotive Technology. The program produces instructional materials and equipment utilized in classroom settings and one of these is a Part-Time Four-Wheel Drive Safety Device. This device is used in Autotronics without assessing its acceptability. The purpose of this study is to evaluate the acceptability of instructional equipment the part-time four-wheel drive safety device in terms of functionality, aesthetics, and safety. The study utilizes a descriptive research methodology. The research explores factors affecting the device, identifies specifications for improvement, and suggests component adjustments. The evaluation encompasses technical values such as aesthetics, functionality, and safety, assessed through the Likert Scale. The evaluation results showed the instructional tool to be highly acceptable in terms of functionality, aesthetics, and safety, providing valuable resources that benefit the Autotronics program at the University of Science and Technology in Southern Philippines Cagayan de Oro campus. The Part-Time Four-Wheel Drive Safety Device demonstrates its potential to improve learning and practical abilities. These findings highlight the usefulness of innovative instructional materials in overcoming standard teaching limitations. A recommendation is made for further research.

**Keywords:** Part-Time Four-Wheel Drive System, Safety Device, Instructional tool, Autotronics Program

## INTRODUCTION

USTP has an Autotronics program previously known as BS Mechanical Automotive Technology. The program has numerous developed trainers that are utilized in classroom instruction. The program encourages to evaluate trainers for the Autotronics classroom setting. One of the trainers evaluated is the part-time 4-wheel drive device, which is a device for structured view in a classroom setting. The most important step in assessing how a part-time four-wheel drive safety device for education in the classroom operates in a four-wheel drive system (4WD) is to evaluate the device's functionality. This assessment guides the instructors and students in the Autotronics department at the University of Science and Technology of Southern Philippines. The most essential learning process in the classroom is how students can learn easily, be autonomous, be comfortable, and be able to express creative ideas through evaluation [1]. The importance of teaching strategically is that the instruction material has to be articulated effectively to the students to make them understand the fundamental knowledge. Innovative and dedicated automotive instructors should be selected to exploit the classroom environment in terms of successfully being offered as a resource for learning [2]. Training materials are tangible resources with educational content that are geared toward trainees. Educational resources improve the process of teaching and learning by providing the data required to gain skills and knowledge. As the Philippine education system has fully incorporated senior high school into its K-12 curriculum, trainers are indispensable as instructional resources for automotive technology education. Students enrolled in the K-12 vocational track's automotive technology course must become knowledgeable about every part of the automobile [3]. Many teaching tools are used to teach automotive servicing. This ranges from traditional academic lectures, textbooks, hands-on shop work, and computer-based resources. In the educational area of industrial technology, specifically in the study of automobiles (gasoline and diesel) and associated components, it is necessary to use instructional materials that can simulate, test, and obtain specific data of the operation.

Many students still struggle to understand several automotive ideas in the context of modern advanced automotive technology. To enhance understanding and facilitate the application of the concepts being presented, instructional trainers or devices are still required despite the best efforts of experienced instructors [4]. The objective of the project is to create a device that can save and accommodate more trainees for practice and performance at the same time. Additionally, the suggested device has additional functional characteristics compared to the conventional car [5].

## THE EVALUATION OF INSTRUCTIONAL MATERIALS IN AUTOMOTIVE

It emphasized that the teaching profession gains from instructional materials that contain evaluation. It uses strategies that guarantee and generate moral lessons in educational settings to support instructors in enhancing the comprehension of students. It aimed to provide answers to the Instructional Trainer's acceptance in terms of its functionality, aesthetic, safety, and content quality [6].

## AESTHETICS

The researchers emphasize the importance of aesthetic appeal in instructional materials. The device's design involves a collection of detailed and iterative selection procedures that depend on a variety of skills and are impacted by several variables, including changing consumer preferences, marketing demands, ergonomic satisfaction, manufacturing constraints, and technical design limitations [7]. High-quality images and illustrations are essential for conveying accurate information. Clear, detailed images help students better understand automotive concepts, parts, and processes [8].

## FUNCTIONALITY

Instructional materials should accurately simulate real-world automotive scenarios. This includes realistic representations of vehicle components, systems, and interactions. Accurate simulations enhance hands-on learning experiences, allowing students to apply theoretical knowledge to practical situations [9]. The Trainer enhanced functionality in which the laboratory set-up procedures can be accomplished with

greater accuracy in less time due to its plug and unplug features. It is more presentable because the component assemblies and wiring connections are properly fitted. It can also provide consistent performance and has easy access for maintenance and servicing in the future [10].

**SAFETY**

Effective evaluation includes mechanisms for acceptability. Incorporating evaluation from both instructors and learners ensures that instructional materials evolve to meet changing safety standards [11]. The evaluation considers the integration of technological tools, such as virtual reality or augmented reality, to enhance safety training [12]. The support of safety training and goals provides feedback to motivate the use of the knowledge gained and offers incentives or rewards for reinforcing safe performance to attain a positive result [13].

**STATEMENT OF THE PROBLEM**

The University of Science and Technology of Southern Philippines lacks certain materials of equipment needed for its Autotronics program. The absence of emotional attachment, equipment, and resources in those settings, along with the students' perception of their poor learning process and lack of digital competency, inhibited their cognitive and affective involvement [14]. Students find it difficult to finish tasks and lack the skills necessary to plan and engage in learning activities that advance proficiency with the technology they have been taught. Students can participate in interactive learning while being introduced to or expanding upon their understanding of four-wheel drive operations with the help of the Part-Time Four-Wheel Drive Safety Device. This double problem emphasizes how important it is to assess the part-time four-wheel drive as instructional materials, taking into account the requirements and viewpoints of instructors and learners in automotive education courses. To improve learning outcomes and close the gap in practical training for automotive technicians.

**METHODOLOGY**

**RESEARCH DESIGN**

In addressing the identified problem for this study utilize the descriptive research method. Descriptive research relies heavily on observational and correlational data. It involves collecting data through surveys, interviews, observations, or existing records. The data collected are often quantitative but can also include qualitative information, such as descriptions, narratives, or observations [15]. In this particular phase, the researchers evaluate the results of a device used for classroom instruction the part part-time four-wheel drive safety device.

**RESEARCH SETTING AND RESPONDENTS OF THE STUDY**

The study was conducted at the College of Technology, University of Science and Technology of Southern Philippines, Cagayan de Oro City Campus. The respondents of this study would be six (6) instructors from the College of Technology, eleven (11) students from the Autotronics course, and three (3) experts from the automotive industry. These respondents purposefully selected for the knowledge related to automotive to varied extents.

**RESEARCH INSTRUMENT**

The research instrument used in the study was composed of Technical Values with categories such as aesthetics, Functionality, and safety of the instructional device purposefully designed for a part-time four-wheel drive. The said instrument was adopted from the study of Barbosa [16]. Each item evaluated is measured by the 5-point Likert Scale. Table 1 shows the Range of Values and its corresponding description, which used to textually describe the mean obtained from the items being evaluated.

**DATA COLLECTION**

A functionality and safety test of the safety device on the Part-Time four-wheel drive device was done as critical aspects of competency. An assessment was conducted to evaluate the effectiveness of the innovations by the students, academy experts, and industry experts. The data are processed by statisticians to validate the results [17]. Conducting the Technical Values test on the safety device designed for part-time four-wheel drives is one of the study's critical aspects of competency. During the data collection, the device is evaluated according to the categories specified based on the Technical Values categories such as aesthetics. After the device was evaluated by the Technical Values instrument, the instrument was collected by the researchers to prepare for data analysis.

Table 1. Range of Values and Descriptive Equivalent Basis for Data Analysis

Data Analysis			
Numerical Scale	Range of Values	of	Descriptive Equivalent
5	4.24-5.00		Very Highly Acceptable
4	3.43-4.23		Highly Acceptable
3	2.62-3.42		Moderately Acceptable
2	1.81-2.61		Fairly Acceptable
1	1.00-1.80		Not Acceptable

**DATA ANALYSIS**

The data collected in this study analyzed through the usage of the Mean and Standard Deviations. The basis for the analysis of the mean and standard deviation score is outlined in Table 1.

**EVALUATING THE PROCESS OF THE TRAINER**

Gathering evaluation from students about the learning experience can offer valuable perspectives on the effectiveness of the trainer's teaching methods and the clarity of instructional materials. Surveys or questionnaires can be administered anonymously to encourage honest responses [18]. The researchers conducted a crucial pilot test wherein the presence of its key contributors and rehearsing the course material is necessary in carrying the said test out. Based on the findings of the evaluation, adjustments are necessary to improve the device and optimize its effectiveness in the classroom. This could involve revised instructional materials, modified the design of the device, or providing additional training and support for instructors. Continuous evaluation and interaction are essential to refining the device and ensuring its ongoing relevance and usefulness in the educational context [19].

**ASSESSMENT AND EVALUATION PHASE**

The study was performed at the University of Science and Technology in Cagayan de Oro Southern Philippines College, participants in the interview and consultation process included students from Autotronics, faculty members from the College of Technology, and industry specialists. The researchers collected directly from main sources through interviews and surveys. The researchers demonstrated the device to the respondents so they could assess it and offer suggestions for improvements [20]. The device evaluated based on its acceptability by used technical values as an instructional trainer [21]. The assessment supports the program becoming fully functional. A device designed to enhance teachers' understanding and application of school performance assessments and implemented to a real-world scenario. Using several information sources and data collection techniques, three program components; delivery, materials, and outcomes assessed in turn over three iterative efforts [22]. Teachers' views of this device's effectiveness can be detected for enhanced comprehension and future changes and improvements, adding to the body of knowledge on the subject of trainer learning while also offering a thorough evaluation to facilitate future advancements [23].

**RESULTS OF THE DATA ANALYSIS**

**Table 2. Data Results of the Overall Mean of the Technical Values Assessment**

Indicator	Mean	SD	Description
Aesthetics	4.51	0.69	Very Highly Acceptable
Functionality	4.74	0.46	Very Highly Acceptable
Safety	4.69	0.51	Very Highly Acceptable
Overall	4.65	0.55	

**EVALUATION OF THE ACCEPTABILITY AND FUNCTIONALITY OF THE PART-TIME FOUR-WHEEL DRIVE**

In determining the acceptability and functionality of the part-time 4-wheel drive, the respondents evaluated the four-wheel drive's design in correspondence to its technical values such as its aesthetics, functionality, and safety which were all evaluated technically based on the fundamentals of the Likert Scale. The table 2 presented the results of the overall Mean of the Technical Values assessment. The summary result and the findings of the data analysis are presented wherein the device is evaluated with a rating of Very Highly Acceptable in terms of Aesthetics (M=4.51, SD=0.69) and Meanwhile categories such as the device's Functionality (M=4.74, SD=0.46), and Safety (M=4.69, SD=0.51). The device received a very highly acceptable overall rating in its evaluation, receiving a value of 4.65 as its overall mean and having a standard deviation of 0.55.

**CONCLUSION**

The study provides an innovative teaching material or tool for the Autotronics program. An instructional tool is an alternate communication channel that an instructor might use to help students understand instructional material more thoroughly [24]. This learning tool's importance comes from its capacity to demonstrate to students what a four-wheel drive safety device is and how to use it for the laboratory activities. The instructional device includes distinctive features that allow students to gain knowledge of the operation of four-wheel drive safety equipment. Instructional materials can be utilized to ease, encourage, stimulate, and promote teaching and learning; they are regarded to be the key to the success of Autotronics programs [25].

**RECOMMENDATION**

Since this particular study has been only conducted on a device the experts recommend that a significant portion of the safety device should be improved to meet expectations that would be more realistic for its intended purpose. Among these recommendations would be to conduct tests on an actual part-time four-wheel drive vehicle to gain more realistic results and the safety device's speed limit to be reduced from around 20 kph to 50 kph to match the average speed of an actual vehicle while making used 4-wheel drive vehicles.

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