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Implementing the Competency Assessment Package (ICAP) for Automotive Educators

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Abstract
The Implementation of the Competency Assessment Package (ICAP) was the evaluation of the autotmotive educators' competence and skills in their field of expertise. The main objective was implement the competency assessemnt package through training program to the automotive educators. The material was classified into five competencies according to TESDA training regulations, encompassing packages on preventive maintenance, electrical wiring installation, drum brake system disassembly, manual transmissions, and drive-light vehicles, which serve as the content for automotive educators' learning materials along with their primary responsibilities. Each package assessed competencies pertaining to performance, reliability, credibility, perceived quality, safety, repair techniques, and problem-solving capabilities. The research employed a developmental research design. This methodology enabled researchers to methodically examine the evolution of diverse educational practices and their effects on competence outcomes across time. The ICAP was succesfully implemented and it was found to be extremely satisfied with the criteria for building skills cmpetence. The performance of the package significantly improved from not meeting the expectation to very satisfactory levels with all indicators being higly acceptable.

Keywords: Assessment Tool, Automotive Educators, Competency, ICAP, TESDA, Package, Educators, Training, Performance.

1. Introduction

Automotive educators require upskilling due to inadequate training and abrupt competency shifts from TESDA. To enhance the efficacy of training programs, DepEd institutions must tailor learning resources to conform to industry norms and practices (Pecaso & Pecaso, 2018). Collaboration between educational institutions and automotive industry experts can enhance the relevance and effectiveness of training programs (Sirakaya & Kilic Cakmak, 2018). Inadequately aligned educational resources lead to diminished performance on national certification examinations, creating deficiencies in knowledge and competencies. Developing more suitable educational resources can improve pupils' readiness and self-assurance (Drexler et al., 2019; Nurtanto et al., 2020). Furthermore, DepEd schools frequently lack essential educational resources, which may impede students' performance in national evaluations. Addressing these deficiencies is essential for improving educational performance and guaranteeing equitable opportunity for all educators and to the students to succeed.

The study introduces a material development package based on the competency standard, aiming to improve educational outcomes by incorporating feedback and fostering a collaborative environment. The

ICAP, developed by the writer, helps automotive educators in Bukidnon prepare for the national TESDA exam by providing essential resources for skills enhancement training. This innovative approach enhances teaching techniques and ensures superior instruction in automotive skills (Race, 2019; Stevens & Levi, 2023). The program also emphasizes collaboration between educational institutions and local sectors, allowing students to connect academic knowledge with real-world applications in the automotive sector (Onyango, 2023; Owens, 2021). The ICAP incorporates experiential learning theory, hands-on experience, and reflection, enhancing understanding and engagement with the subject. This proactive strategy improves the overall quality of automotive education and encourages the adoption of contemporary instructional methodologies.

Statement of Purpose

- To examine the competence of the automotive educators.
- To identify the focus area of the training program.
- To implement the training package.

Significance of the Study

This study involved implementing the competency assessment package to improve the competence of automotive educators. The participant utilized the instructional materials as a basis for their performance task, and the training's output was evaluated for effectiveness. The study's findings would benefit but are not limited to automotive educators, Technology and Livelihood Education (TLE) and Technical Vocational Livelihood (TVL) students, school administrators, the Instructional Systems Design program, future researchers, and the numerous Department of Education (DepEd) programs.

A strong collaboration with community entities, industries, and assessment and training centers would enhance the experience of automotive educator participants and ultimately benefit the students. Through these connections, they will act as the crucial link between the school and educational institution by providing support through learning resources, tools, and equipment essential for the skills upgrading process. Through internships and experiential learning opportunities, these partnerships could help students acquire highly esteemed practical skills in the automotive sector. By cultivating such ties, educational institutions may guarantee that their curriculum stays pertinent to contemporary industrial requirements.

With a new training guide for teachers that matches the competency standard, TLE and TVL automotive educators can better support their students by teaching them the important skills needed to gain national competencies, which are essential for their jobs if they can't go on to higher education. They can effectively assess students' competencies based on the established standards.

The study's findings would benefit all TLE and TVL students enrolled in the automotive subject. The ICAP contains the educator's updated knowledge and skills, which they can utilize to their advantage. The new package will update the educators' national qualifications. Educator training will be provided, and educational learning resources will be guided by the package.

Competency assessment packages, which prepare students for academic success and national assessments, improve automotive educator readiness, according to the study. These packages are crucial for students in Ph.D. programs to design instructional systems and contribute to DepEd's educational programs. They provide clear learning objectives, enable customization, facilitate data-driven decision-making, standardize, promote educator development, and foster transparency. Future researchers can

model the framework to customize their studies, enhancing the knowledge corpus and promoting innovation within the ISD community.

Finally, this study's results aid future researchers. They can investigate additional variables and instruments that contribute to improving the competency-based assessment package or any other competency sought to fill the education sector's learning gap. This comprehensive approach would enhance the understanding of teaching practices and results, encouraging a culture of ongoing enhancement inside educational institutions. Moreover, by disseminating developments and exemplary practices, teachers can collectively improve their techniques, augmenting student learning experiences in many situations.

Research Methodology

The research employed a developmental approach to improve the educational experience through the provision of the competency-based assessment packages. This method enables educators to track their advancement and tailor instruction to meet standard requirements. This personalized learning environment boosts overall proficiency and enriches the educational experience. Developmental research designs are essential for clarifying development and change, and the materials, including the primary work of automotive educators, can augment skills, knowledge, understanding, depth, or breadth (Ounjian, 2024). This method improves the entire learning experience and deepens comprehension of the subject matter.

Research Participants

The study involved automotive educators in the Technology and Livelihood Education (TLE) and Technical Vocational Livelihood (TVL) departments. The researchers obtained information from human resources and visited schools to identify automotive educators. Secondary teachers from Malaybalay City, Bukidnon, and Valencia City divisions were selected using the purposive sampling method. They had at least six months to one year of experience in the specialized field. The researcher selected the participants based on their experience in TVL or TLE, specifically in the automotive experience. The study included all automotive instructors as participants, and it was about the studies of Safari et al. (2022) and Thacker (2020), which recruited individuals based on their experience to gather information. Participation required approval of consent letters, but participants did not need to handle automotive subjects.

Ethical Considerations

The researcher followed research ethics throughout the study, including the development of the ICAP and implementing the program in the training. Participants were informed about the study's objectives and benefits, ensuring they felt comfortable with their participation. The university's Research Ethics Committee (REC) was involved to ensure ethical standards were followed. Transparency was promoted, fostering open communication and engagement. The school head provided a communication letter for participants, allowing them to attend in-service training for secondary teachers. This training aimed to refine competencies and improve the learning environment. The least mastered competencies were identified, forming the basis for the SCBAM. The training program aimed to develop a holistic learning environment, addressing both strengths and weaknesses. Confidentiality and identity were ensured

through the consent form, and experts were tasked with evaluating the research instruments, instructional assessment package, and training output.

Data Analysis

The research used non-probability and purposive sampling to select teachers teaching automotive subjects in junior and senior high schools. The study aimed to collect qualitative data on teaching methods and problems using the ICAP. The educator-participants' skills in competency assessment and training were assessed using a revised evaluation tool from Chavez and Pepito's study (2023) on creating and testing the autotronics simulation model. Descriptive statistics were used to analyze data on competency-based assessment needs. Participants and experts evaluated the instructional assessment package and materials. The competency-based assessment and training competency were evaluated using a modified instrument. Data was analyzed using SPSS and interviews to validate training experience and performance.

Result and Discission

The researcher performed a pre-training evaluation to measure teachers' skills via practical and theoretical assessments. A post-training evaluation ensued, intended to detect any deficiencies. The training program, utilizing the ICAP, produced competency measures, encompassing mean scores and standard deviation. The training was conducted across three days, with the initial day featuring an online lecture. Days 2 and 3 were dedicated to the execution of competency assignments, encompassing practical activities to reinforce the principles discussed in lectures. Attendee feedback indicated substantial enhancements in understanding and skill using the ICAP learning content.

Day 1: Online Lectures

The researcher commenced the online training program, highlighting the theoretical elements essential for automotive competencies. The researcher subsequently presented participants with educational materials on automotive electrical wiring installation, brake system components, and manual gearbox functions. The online lectures aimed to create basic knowledge, thereby equipping trainees for the following practical exercises.

The trainer-expert advised the teacher-participants in the online lecture that they are required to finish all activities. Each of the five modules contains specific tasks designed to strengthen the skills of the teacher-participants. Their proficiency was achieved by the application of rubrics derived from Garvin's theory. The trainer-expert emphasized the significance of these rubrics in establishing explicit evaluation criteria, ensuring that all educators receive constructive feedback. This systematic approach fosters professional development and encourages a collaborative learning environment.

Day Two: Practical Competency Assignments

The second day of instruction was marked by practical, hands-on work. Participants engaged in the following activities: The trainees were tasked with the installation and testing of vehicle electrical circuits. The educational materials provided on the first day were utilized to ensure proper installation and safety. The students dismantled a drum brake system, examined its components, and then reassembled it. This job underscored the need of understanding the braking system for vehicular safety. Participants conducted the disassembly and reassembly of a manual transmission, examining gears and shafts. This activity provided practical insights into the mechanisms of car transmission systems.

Table 1: Summary Table of Training Implementation

Day	Activity	Mode	Focus
1	Online Lectures	Online	Auto Electrical Wiring, Drum Brake System, Manual Transmission
2	Practical Competency Task	Hands-on	Electrical Wiring Installation, Drum Brake, Manual Transmission Assembly/Disassembly
3	Practical Competency Task	Hands-on	Vehicle Preventive Maintenance and Driving Light Vehicle

Table 1 summarizes the training implementation. On the second day of the training, the researcher designated this period for the competency tasks of the teacher participants. The researcher supplied the instructor participants with resources, instruments, and apparatus for their practical tasks. We evaluated the competency of all instructor participants utilizing Garvin's Theory rubric framework.

The teacher-participants engaged in various exercises designed to showcase their instructional methods and effectiveness. Each ability received prompt feedback, facilitating rapid reflection and enhancement. This fast assessment fostered a conducive learning environment and encouraged participants to modify and improve their tactics accordingly. The training sessions transformed into vibrant discussions as educators exchanged insights and strategies that enhanced their teaching effectiveness.

Day 3: Preventive Vehicle Maintenance and Operation

The final day underscored preventive maintenance and essential driving skills. Participants conducted vehicle checks to detect potential concerns prior to their escalation into significant problems. They practiced operating a light vehicle under supervision, employing the skills developed over the preceding two days to guarantee safety and efficiency.

Mahmood (2021) and Morrison et al. (2019) demonstrated that instructional strategies enhance the effective utilization of instructional content. The course utilized a sequential learning methodology, advancing from theoretical understanding to actual implementation. This approach ensures that participants understand the principles before their implementation in a real context. The online lectures established a crucial basis necessary for the practical exercises performed on the second and third days. The practical exercises performed on the second day allowed learners to engage directly with the contents and systems discussed on the first day. Practical experience is crucial in vocational training, as it enables learners to develop the necessary skills and confidence for performing automotive duties.

The trainer-expert concentrated on the competency assignment on the last day, and the training included extensive skill development across various areas, such as electrical wiring, brake systems, manual transmissions, car maintenance, and driving. This method enables participants to proficiently handle various automobile responsibilities. Participants conclude the program with enhanced technical skills and increased confidence in their problem-solving capabilities. As a result, they are sufficiently prepared to tackle actual challenges in the automotive sector.

Table 2: Trainer-Experts' Evaluation Summary for the Participants on the Implementation of the Competency Assessment Package (ICAP)

Criteria	Mean	Std. Deviation	Descriptive Rating	Qualifying Statement
Preventive (BLOW	4.92	0.17	Very Highly Compe-	Very Highly Skilled

BAGETS)			tent	
Electrical Wiring Installation	4.91	0.16	Very Highly Competent	Very Highly Skilled
Drum Brake	4.91	0.22	Very Highly Competent	Very Highly Skilled
Transmission	4.95	0.17	Very Highly Competent	Very Highly Skilled
Drive Light Vehicle	4.85	0.32	Very Highly Competent	Very Highly Skilled
Overall Mean	4.91	0.21	Very Highly Competent	Very Highly Skilled

This preparation fosters a sense of readiness, allowing individuals to adapt to the changing demands of their roles. The networking opportunities offered by the program enable participants to engage with industry experts, ultimately enhancing their skill development.

Table 2 demonstrates the robust proficiency of the automotive instructor participants in the training across all parameters. All competency criteria have markedly increased mean scores, signifying the automotive teacher's development, ensuring that all educators achieve a common standard of consistent excellence across all dimensions of their proficiency. The automotive instructors demonstrated exceptional skill with minimal competency variations, indicating a well-trained and knowledgeable group capable of delivering high-quality automotive education.

Result shows the exceptional achievement of the automotive instructor participants in the program across all parameters. All performance parameters have markedly increased mean scores, signifying that the automotive teacher participants possess a high degree of expertise in these areas. Preventive maintenance achieved the highest mean score of 4.91, indicating that the participants demonstrate exceptional proficiency in this domain. It demonstrates a constant proficiency in employing the ICAP. All criteria exhibit relatively low standard deviations (SD), with the light vehicle registering the highest value at 0.32. The closeness of participants' scores to the mean indicates consistent performance among the group.

The overall competency demonstrates that the average score of 4.91 affirms participants' exceptional level of knowledge and skill in automotive instruction provided by the ICAP. The comprehensive competency assessment validates the individual scores and underscores the favorable results of the training. The overall ratings are elevated; nevertheless, the somewhat lower score in Drive Light Vehicle (4.86) compared to other categories suggests a potential area for enhancement. Targeted training or resources in this field may enhance overall proficiency.

The research corroborates the conclusions of Lajunen et al. (2022) and Bastiaan (2019), demonstrating that a proficiently trained educator can excel under the mentorship of the trainer and the ICAP. The evaluation results indicate that the automotive teacher participants exhibit substantial knowledge and proficiency in the evaluated domains. The minimal standard deviations signify consistent performance, illustrating the effectiveness of the training program. Future training activities may focus on improving abilities in the Drive Light, similar to other pertinent modules (Bailey, 2022; Myers, 2021; Obadiah et al., 2024).

Practical Implementation

The focus on preventative maintenance and driving on the final day underscored the practical application of abilities in real-world scenarios. This practical application of skills solidified the learning process and prepared participants for actual work contexts (Barus & Simanjuntak et al., 2021; Rice & Ortiz, 2021; Sumandya & Widana, 2022).

Blanchard and Thacker (2023) and Choi et al. (2019), who successfully amalgamated online learning with practical tasks, received validation from the findings of the current study. The training framework conformed to recognized best practices in vocational education. The amalgamation of online education with practical assignments improves information retention and skill acquisition among participants (Chan, 2021; Crompton et al., 2023; Fleischmann, 2021; Listiani, 2022; Sasmito, 2021). The shift from theory to practice, then applied in real-world circumstances, represents a recognized method for effective skill development.

The incorporation of car maintenance and driving activities equipped participants for both particular technical tasks and the overarching responsibilities linked to automotive settings. This extensive training methodology cultivates the development of proficient and confident individuals in the automobile industry.

The Competency Package

During the conception phase of the training program for automotive educators, the researcher included the following modules to address the specified areas for improvement. The studies conducted by Handoyono (2020) and Bragg, Walsh, and Heyeres (2021) corroborate the ICAP research. The implementation aspect of instructional materials entails teachers effectively employing produced tools to improve individual learning experiences.

Preventive Maintenance

The researcher customized each program to improve particular competencies and organized it to deliver both theoretical understanding and practical expertise. The objective of preventative maintenance (BLOW BAGETS) is to equip educators with the essential competencies for conducting comprehensive preventive maintenance inspections and procedures. The Subject. The training included a comprehensive introduction to BLOW BAGETS, an acronym for battery, light, oil, water, brakes, air, gas, engine, tires, and self—practical experience in automotive repair. The researcher employed many approaches and tools to identify issues.

Competency Assignments. To ensure that the teacher participants in the training could perform the required tasks, the author let them to elucidate the fundamental functions, conduct basic maintenance, assess the specific gravity, replenish the batteries with distilled water, and adhere to safe work standards. The participants undertake all tasks during the learning sessions, gaining practical experience that reinforces theoretical comprehension. This practical approach enhances student understanding and fosters confidence in their ability to manage similar activities in real-world contexts.

The BLOW BAGETS training activity concentrated on vehicle lighting inspection, enabling participants to utilize fundamental functions, examine circuit diagrams, and execute electrical installations. Participants acquired the ability to recognize prevalent problems with automotive lighting, including faulty bulbs and electrical failures. They developed confidence in identifying problems and maintaining compliance with safety rules. The trainer-expert conducted oil maintenance evaluations, testing participants'

knowledge of oil changes and providing guidance to enhance their comprehension. This pragmatic method enhanced their abilities and underscored the significance of regular maintenance for optimal engine performance.

The professional trainer facilitated a training session aimed at enhancing participants' technical abilities and teamwork. The trainer-expert instructed them to assess the cooling system, braking system, automotive accessories, fuel, electrical components, and tire maintenance. The workshop aimed to augment participants' expertise and competencies in these domains. The training emphasized proficiency tasks in cooling, braking, gas, and tire systems. Participants were urged to document their views and propose enhancements. Gas inspections were essential for preventive maintenance, and participants were urged to cultivate camaraderie and comprehension of electrical components. Tire maintenance activities included routine inflation, tire identification, and evaluation of tire degeneration. The trainer-expert and participants synthesized theoretical knowledge with practical skills, facilitating the application of these methodologies in tire vehicle assessments.

The concluding element of the preventative maintenance encompassed self- and vehicle preparedness. To meet the competency objectives, the trainer-expert required the teacher-participant to comprehend document-based self- and vehicle awareness. The instructor evaluated their proficiency during the activities and conveyed defensive driving information in the lesson. The trainer-expert has created an exercise to determine the required documents for preparation. The activity involved questioning the teacher-participants about their individual and vehicle preparations prior to driving. The discussion highlighted the importance of thorough preparation, including documentation and a detailed understanding of the vehicle's parts and safety features. The trainer-expert aimed to transmit knowledge to foster a culture of accountability and diligence among the teacher-participants, equipping them to effectively convey these concepts in their competency tasks.

Installation of Electrical Wiring

The Subject. The skilled trainer evaluated the proficiency through practical activities and theoretical assessments. The Electrical Wiring Installation Competency seeks to augment educators' proficiency in the installation and diagnosis of electrical wiring systems in cars. The following literature includes: fundamental principles of car electrical systems; electrical diagrams and layouts; installation procedures and safety measures; and methods for identifying and correcting faults. The competency assessment includes practical wiring assignments, diagnostic tasks, and written examinations.

The Competency Assignments

To achieve the goals of electrical installation, the trainer-expert instructed the participants to engage in the task of executing auto electrical wiring. The evaluation of their knowledge regarding the actual installation enhanced their comprehension of electrical wire upkeep. The trainer-expert has prepared the materials for this task during the training. The participants performed the electrical wiring symbols, analyzed the diagram, and placed the components. As students progressed, the trainer-expert provided constructive feedback, aiding them in refining their approaches and addressing common challenges. This practical experience bolstered their confidence and deepened their comprehension of the intricacies involved in electrical installations.

Braking Mechanism

The Subject. The braking System aims to improve teachers' comprehension and proficiency in braking system maintenance and inspection. The information is solely relevant to the drum brake system, in contrast to other brake systems. The guide provides a summary of the various components and their distinct functions. The document outlines the procedures for inspecting and repairing brake systems. Protocols exist to guarantee safety. Competency testing includes practical evaluations of the braking system, safety drills, and knowledge assessments.

Competency Assignments: To achieve the objectives of this topic, the trainer-expert instructed the participants to engage in the assembly and disassembly of brake components. The trainer improved their understanding of brake maintenance by assessing their knowledge of brake shoe replacement during the assembly and disassembly of brake components. The trainer-expert has systematically arranged the materials and equipment for this practice. This preparation ensured that each participant possessed the necessary tools, allowing them to practice effectively and confidently. Upon completion of the training session, the participants demonstrated a thorough understanding of brake repair techniques, which will benefit their future endeavors.

Manual Transmission Assembly and Disassembly

The Subject. The aim of the Assembling and Disassembling Manual Transmission course is to augment educators' proficiency in the assembly and disassembly of manual gearboxes. The data outlined the elements of a manual transmission and the procedures for construction and disassembly. The researchers and the trainer identified common concerns and suggested solutions. They utilized techniques to sustain and restore the manual transmission. The competency examination includes practical tasks involving assembly and disassembly, troubleshooting exercises, and theoretical assessments.

The Competency Assignments. An skilled trainer adeptly oversaw the construction and disassembly of the manual transmission during the training session. The expert trainer instructed the participants in the installation, disassembly, and labeling of the manual transmission, ensuring the achievement of the topic's objectives. The teacher participant facilitated understanding of the exercise by assessing their knowledge of actual assembly and disassembly chores. This collaborative approach not only enhanced their understanding but also cultivated a sense of unity among the participants, enabling them to effectively implement their academic knowledge in practical scenarios. The trainer provided constructive comments throughout the course, enhancing the learning experience and instilling confidence in each participant's talents.

Light Vehicle Operation Program

The Drive Light Vehicle program aims to improve teachers' expertise in instructing and performing driving maneuvers for light vehicles. This competency encompasses vehicle maneuverability and regulation, emphasizing safety and compliance with driving laws, as well as methodologies for teaching driving skills, including practical instruction. The competency evaluation includes assessments of driving skills, instructional techniques, and tests to ensure compliance with safety regulations. Participants assessed the efficacy of the training modules and evaluated instructor competency both before and throughout the training using rubrics and evaluation questionnaires.

The Competency Assignment. To achieve the goals of these abilities, the trainer-expert instructed the teacher-participants to navigate the vehicle through a zigzag obstacle course and perform nose-in and

nose-out parking procedures. They must precisely use the steering wheel in coordination with flagsticks and perform without disturbing the obstacle configuration. Assessing the trainees' understanding of operating light vehicles in alignment with the national competency standard can improve their mastery of the task. The instructor has arranged the resources for this activity in the specified location. The trainer-expert has organized the materials for this activity in the designated area, ensuring that all necessary equipment is easily available. This preparation improves the training process and allows teacher-participants to focus on honing their skills and understanding the complexities of vehicle operation in various environments.

Teacher-participants utilize the ICAP guide to maneuver through zigzag obstacle configurations, showcasing their comprehension of handbook protocols. They adjust their movements based on real-time input, illustrating the efficacy of training. They position vehicles in two distinct configurations, improving their spatial awareness and confidence in restricted spaces. The ultimate challenge entails maneuvering a car into a parallel parking position while avoiding contact with the obstruction. The instructor offers critiques and suggestions for enhancement, improving their parking skills and self-assurance in maneuvering autos in restricted spaces. This activity improves their comprehension of parking strategies and boosts their general confidence.

CONCLUSION

The ICAP is highly regarded for building automotive abilities proficiency. The training augmented and prepared the automotive educators with the requisite knowledge and skills. The implementation of the ICAP was deemed successful. The training design, participant involvement, and outcomes clearly indicated the necessity for automotive educators to improve their skill proficiency. The improvement in performance exhibited an increased proficiency among automotive educators, signifying the efficacy of the five ICAP modules in developing the skill competency of DepEd automotive instructors. Consequently, the educational ICAP courses augment and fortify automotive abilities proficiency.

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