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Development and Validation of Contextualized Practical Skills Workbook on Electrical Installation and Maintenance (EIM)

Ronalyn S. Galve[1] and Telesforo D. Escoto[2]

[1,2]Sorsogon State University in Sorsogon City, Philippines

***Abstract*—** This study, titled" Development and Validation of Contextualized Practical Skills Workbook of Electrical Installation and Maintenance," validated the four factors: content, format, presentation and organization, accuracy and up-to-datedness. Sixteen electrical teachers participated in the province of Sorsogon. A mixed method descriptive-developmental research design was employed, with data gathered through surveys and interviews. Findings revealed that the contextualized practical skills workbook's content obtained a total mean score of 28 out of 28 under Factor 1, indicating that it passed the evaluation criteria with minimum passing score of 21 points. Factor 2 gathered a total mean of 71.96 out of 72 which signifies that the workbook's format passed the minimum required passing score of at least 54 points. Factor 3 obtained a total mean score of 20 out of 20 points, surpassing the minimum score of 15 which means the material's presentation and organization passed and very satisfactory. Finally, Factor 4 passed the evaluation under accuracy and up-to-datedness with a mean score of 23.67 out of 24, exceeding the passing score of 20. The study identified four key themes: Standards-Aligned Focused, and Developmentally Appropriate Contents, Organized, Readable User-Friendly Physical Design, Systematic, Scaffold and Learner-Centered Instructional Structure and Technically Verified, and Conceptually Sound Material.

***Keywords*—** Contextualized practical skills workbook, electrical installation and maintenance, TESDA Training Regulation.

I. INTRODUCTION

In 2015, the United Nations Sustainable Development Goal (SDG) 4, "Quality Education", highlighted that education is widely regarded not only as a human right but also as a vital foundation for equity, personal development, economic growth and sustainable development. According to UNESCO 2023, education is essential for sustainable development to ensure inclusive, equitable quality education, and promote lifelong learning opportunities for all. It is well recognized that TESDA National Certificate II are often required during the recruitment of skills workers locally and abroad (Budhrani et al., 2018). In the Philippines, the graduates of K-12 technology-vocational track are expected to possess job-ready competencies when they complete Grade 10 and 12, validated through National Certificate (TESDA, 2015). Electrical Installation and Maintenance (EIM) National Certificate II shall be integrated or assessed concurrently along with the core unit of competency (TESDA, 2015).

The Percentage of Learnings (PL's) of the Grade-11 students in the 3 purposively chosen public secondary schools in Sorsogon province were gathered and analyzed. Results revealed low passing rate of 75%. In the school year 2023-2024, Grade-11 EIM students at Salvacion National High School got 68% in the first quarter, 73% in the second quarter, 75% in the third quarter and 78% in the fourth quarter.

In Barcelona National Comprehensive High School, the 11- EIM students got 36.6% in the first quarter, 37.3% in the second quarter, 58.4% in the third quarter, and 67.5% in the fourth quarter and lastly, Bulacao National High School got 48% in the first quarter, 66% in the second quarter, 69% in the third quarter and 43% in the fourth quarter. The PL's of these 3 three selected public schools were below the average PL of 75%, which means that an appropriate development and innovation should be made for possible to improve the practical skills of the senior high school and tertiary electrical students.

According to Caup and Buda (2017), the DepEd has great confidence in the K to 12 curriculum in providing quality education. Studies on senior high implementation revealed that teachers encountered difficulties such as insufficient instructional material and inadequate classroom facilities. (Resoor,2023). Based on needs assessment on local context, the respondents from Barcelona National Comprehensive High School said that there is limited access to updated equipment and materials and learners only rely on their experiences; thus, learning should integrate both theory and actual practice. At Rizal Integrated National School, limited access to updated tools and equipment has challenged students to improve practical skills, and the respondent suggested a competency-based training that is aligned with TESDA's units of competency.

The Republic Act 10533, also known as the Enhance Basic Education Act of 2013, focuses on improving its curriculum. According to Dohinog et al., (2025), connecting discussion to students' everyday experiences makes learning easier for students and with the integration of contextualized instructional materials. Contextualization helps education in improving students' learning because it shows information that is relevant and meaningful (Flores, 2021).

Using contextualized materials increases student engagement by relating examples to learners' real-life situations (Reyes et al., 2019). Instructional materials can give meaningful experiences and learnings to the students which can be applied during the lesson (Esmeña & Escoto, 2023). This research reinforces the importance of contextualized validated instructional materials to support learning for assessment, technical competence and employability. Ugot & Pasion (2023) explained that when teacher and students use locally-made instructional materials, they themselves will benefit by acquiring new skills and becoming globally competitive individuals.

II. OBJECTIVES OF THE STUDY

The study aimed to develop and validate a contextualized practical skills workbook on Electrical Installation and Maintenance (EIM). To achieve the general objective, the study will pursue the following specific objectives: (1) develop a contextualized practical skills workbook on EIM competencies; (2) Validate the developed contextualized practical skills workbook in terms of (a) Content, (b.)Presentation and Organization, and (c.) Accuracy and Up-to-datedness of information; (3) Identify the feedback of the teachers on the developed a contextualized practical skills workbook; (4) and Propose enhance contextualized practical skills workbook on electrical installation and maintenance.

III. METHODOLOGY

Research Design

It used a descriptive-developmental research design, descriptive methods' primary work is to describe, compare, analyze, and interpret existing data (Gillaco,2014). Beb (n.d) it described developmental method as a body of research literature that focuses to the development of instructional materials. The descriptive developmental method is an organized and systematic study of putting into design, developing, and careful evaluation of instructional materials that must meet criteria (Richey et al., 2005). This research design was used for the development and validation of contextualized practical skills workbook for Electrical Installation and Maintenance students.

Source of Data

There were a total of 16 informants and respondents, 8 EIM experts and 8 EIM teachers, who participated in the evaluation phase of the study and represented 100% of the total respondents. The informants of the study are the Electrical Installation and Maintenance (EIM) experts from 5 DepEd schools, 1 SUC, and 1 TESDA school, from the Division of Sorsogon, for the academic year 2025-2026. The EIM experts such as Master Teachers, Senior Teachers, Head Teachers, SUC Professors, and TESDA Assessor validated the developed contextualized practical skills workbook.

The respondents of this research were the Electrical Installation and Maintenance (EIM) from the Division of Sorsogon particularly teachers from 5 DepEd schools, 1 SUC, and 1 TESDA school, for academic year 2025-2026. The 8 EIM teachers acted as

evaluators by giving their feedback to the developed contextualized practical skills workbook.

Research Instrument

The research employed two major instruments: the Evaluation Rating Sheet for Print Resources, a 6.4 evaluation template of the Learning Resources Management and Development System (LRMDS), and an interview guide. The Learning Resources Management and Development System (LRMDS) evaluation rating sheet is a tool used by EIM experts to validate the development of the contextualized practical skills workbook. The second instrument used for gathering qualitative insights from EIM teachers is an interview guide based on the evaluation rating sheet for print resources adapted from DepEd Learning Resources Management and Development System (LRMDS).

Data Analysis

The data from validation was analyzed and interpreted utilizing suitable statistical tools and measures. The second research objective tackles about the validation of the developed workbook for enhancing practical skills in terms of content, format and presentation and organization, and accuracy and up-to-datedness of information.

The researcher utilized mean as statistical tools to assess the validity of the practical skills workbook, particularly as instructional material. In Factor 1 (Content), resource must score at least 21 points out of the maximum 28 points to pass the criterion.

In Factor 2 (Format), the minimum score is at least 54 points out of the maximum 72 points to pass the criterion. Factor 3 (Presentation and Organization), to pass the criterion, the developed workbook must score a minimum of at least 15 points out of maximum 20 points. Finally in Factor 4 (Accuracy and Up-to-datedness of Information), resource must score 20 out of a maximum 24 points to pass the criterion. The researcher employed a 4-point Likert Scale for the purpose.

Scale	Description
3.50 – 4.00	Very Satisfactory
2.50 – 3.49	Satisfactory
1.50 – 2.49	Poor
1.00 – 1.49	Not Satisfactory

Thematic analysis was used in presenting the feedback and insights of the EIM teachers regarding to the content, format, presentation and organization, and accuracy and up-to-dateness of information of the contextualized practical skills workbook.

The data was recorded, transcribed, generate coding, collating codes into potential themes, checking and analyzing if themes work in relation to the sample verbatim respondents. Practical feedback and experiences from the respondents were also derived from unstructured interview and were recorded during data interpretation phase to enhance contextualized practical skills workbook.

IV. RESULTS

Development of a contextualized practical skills workbook

The contextualized practical skills workbook for Electrical Installation and Maintenance for Electrical Installation and Maintenance (EIM) NC II was developed through a systematic process based on the Technical Education Skills Development Authority (TESDA) Training Regulations, starting with the preparation of the competency map.

The EIM NC II competency map identifies the three core competencies: (1) perform roughing-in activities, wiring, and cabling works for single-phase distribution, power, lighting, and auxiliary systems (2) install electrical protective devices for distribution, power, lighting, auxiliary, lightning protection, and (3)

install wiring devices of floor and wall mounted outlets, lighting fixtures/switches, and auxiliary outlets, which serve as the main basis for the development of the workbook.

Unit of Competency 1, Perform roughing-in activities, wiring and cabling works for single-phase distribution, lighting and auxiliary systems, this unit of competency focuses on learning outcome 1 (LO 1), this includes the electrical tools and equipment, electrical symbols, electrical floor plan, electrical wiring diagrams and the metallic and non-metallic such as Rigid Metal Conduit (RMC), Intermediate Metallic Conduit (IMC), Electrical Metallic Tubing (EMT) and the Rigid Non-Metallic Conduit (RNC) or the Polyvinyl Chloride (PVC).

Unit of Competency 2, Install electrical protective devices for distribution, power, lighting, auxiliary, lightning protection and grounding system, the second unit of competency also focuses on learning outcome 2 (LO 2) and learning outcome 3 (LO 3), which discussed about electrical protective devices such as fuses and circuit breaker, and lighting fixtures such as track lights, incandescent lamp and fluorescent lamp.

Unit of Competency 3, Install wiring devices of floor and wall mounted outlets, lighting fixtures/switches, and auxiliary outlets, this unit emphasizes the discussion about learning outcome 2 (LO 2) and learning outcome 3 (LO 3), which was about the installation of Closed- Circuit Television (CCTV), Fire Detection and Alarm System (FDAS), lighting fixtures (e.g., incandescent lamp and track lights), switches (e.g., single-pole, three-way, four-way, two-gang and three gang), and outlets (e.g., convenience outlet and special-purpose outlet). It also includes safety regulation, electrical Personal Protective Equipments (PPE), and the 5S Pillars (Sort, Set in Order, Shine, Standardize and Sustain).

Each unit of competency is composed of pre-test, information sheet, self-check, activity sheet, and post-test. Guiding learners through a clear and organized process from assessing what they know to building new skills and evaluating their progress.

Validation of the developed contextualized practical skills workbook

Content. Table 1 shows that the developed material obtained a total mean score of 28 out of 28 under Validation of Content, it signifies that it passed the evaluation criteria for content of the LRMDS evaluation rating sheet for print resources with a minimum passing score of 21 points and a maximum score of 28 points. This indicates that the material is free from ideological, racial, and gender biases. It also enhances the development of desirable values and traits and arouses the interest of target readers.

Table 1. *Validation of Content*

Indicators	Mean	Description
1. Content is suitable to the student's level of development.	4 4.00	Very Satisfactory
2. Material contributes to the achievement of specific objectives of the subject area and grade/year level for which it is intended.	4.00	Very Satisfactory
3 Material provides for the development of higher cognitive skills such as critical thinking, creativity, learning by doing, inquiry, problem solving, etc.	4.00	Very Satisfactory
4.Material is free of ideological, cultural, religious, racial, and gender biases and prejudices.	4.00	Very Satisfactory
5. Material enhances the development of desirable values and traits.	4.00	Very Satisfactory
6. Material has the potential to arouse interest of target reader.	4.00	Very Satisfactory
7. Adequate warning/cautionary notes are provided in topics and activities where safety and health are of concern.	4.00	Very Satisfactory
Grand Mean	4.00	Very Satisfactory
Total	28.00	PASSED

Note: At least 21 out of 28 to pass

Presentation and Organization. Table 3 shows that the material obtained a total mean score of 20 out of 20 points under the validation of presentation and organization, surpassing the minimum passing score of 15 and a maximum score of 20. All indicators also received a rating of 4, which means very satisfactory. This implies that the developed material was engaging, clear, and well-structured, with a smooth flow of ideas and sentence structures that is appropriate to the target reader.

Table 2. *Validation of Presentation and Organization*

Indicators	Mean	Description
1. Prints		
1. Presentation is engaging, interesting, and understandable.	4.00	Very Satisfactory
2. There is logical and smooth flow of ideas.	4.00	Very Satisfactory
3. Vocabulary level is adapted to target reader's likely experience and level of understanding.	4.00	Very Satisfactory
4. Length of sentences is suited to the comprehension level of the target reader.	4.00	Very Satisfactory
5. Sentences and paragraph structures are varied and interesting to the target reader.	4.00	Very Satisfactory
Grand Mean	4.00	Very Satisfactory
Total	20.00	PASSED

Note: At least 15 out of 20 to pass

Accuracy and Up-to-dateness of Information. Table 4 presents that the material passed the evaluation under the validation of accuracy and up-to-datedness of information with a mean score of 23.67 out of 24, exceeding the minimum passing score of 20 and a maximum score of 24. Also, all indicators were rated 4 (Very Satisfactory), it indicates that the material is free from conceptual, factual, grammatical, computational, typographical and other minor errors. Moreover, the material does not include obsolete information.

Table 3. *Validation of Accuracy and Up-to-dateness of Information*

Indicators	Mean	Description
1. Prints	**4.00**	
1. Conceptual Errors	3.88	Very Satisfactory
2. Factual Errors	4.00	Very Satisfactory
3. Grammatical Errors	4.00	Very Satisfactory
4. Computational Errors	4.00	Very Satisfactory
5. Obsolete Information	3.79	Very Satisfactory
6. Typographical and other minor errors	4.00	Very Satisfactory
Grand Mean	**3.95**	**Very Satisfactory**
Total	**23.67**	**PASSED**

Note: At least 20 out of 24 to pass

Feedback from the teachers on the developed contextualized practical skills workbook

The first theme, Standards-Aligned Focused, and Developmentally Appropriate Contents, showed that the respondents highlighted the workbook's content as practical and aligned with TESDA Training Regulation (TR), DepEd competencies, and Philippine Electrical Code (PEC), making it suitable for Junior, Senior and Tertiary EIM students. For instance, the workbook supports preparation and readiness for EIM NC II assessment by including competency-based activities that develop and enhance skills development of electrical learners. The discussions are presented

from basic to complex tasks to build students' knowledge and skills gradually.

The second theme, Organized, Readable, User-Friendly Physical Design, showed that the workbook's layout and design are well-organized and presented. The informants also stressed that the prints are readable, the letter size is appropriate to the intended user, spaces between letters and words facilitate reading, and the font is easy to read. The print quality is generally clear with proper contrasting between the text and background, and the binding is sturdy, which enhances usability and user-friendliness.

The third theme, Systematic, Scaffold and Learner-Centered Instructional Structure, highlighted that the workbook follows a systematic and well-sequenced discussion of lessons and activities. The workbook has practical exercises related to real-life electrical tasks and it starts with basic concepts such as introduction of electrical tools and equipment to more complex skills and applications such as installation of closed-circuit television. The material is also well-structured and scaffolded to build understanding independently and improved technical competence.

Finally, the fourth theme, Technically Verified, updated, and Conceptually Sound Material, showed that the data of workbook is aligned to the curriculum standards and provisions of TESDA Training Regulations (TR), and Philippine Electrical Code (PEC). The workbook is free from grammatical and computational errors, sentences are well-constructed to avoid misconceptions. It also includes updated devices and discussions such as installation of CCTV, FDAS, single-pole, 3-way, 4-way switches and track lights that are related to national certificate II assessment.

Enhanced Contextualized Practical Skills Workbook on EIM

As a major output of this research study, a contextualized practical skills workbook on Electrical Installation and Maintenance was developed.

This Unit of Competency 1 is composed of learning outcome 1 (LO 1), Install electrical metallic and non-metallic (PVC conduit). This unit of competency offers a key introduction on the electrical installation and maintenance tools and equipments, electrical symbols and wiring diagrams, electrical metallic and non-metallic conduit, wire ways and distribution frame panel board/ safety switch and used in roughing-in based on the required performance standards. In addition, this unit also covers the outcomes required in preparing for cable pulling and sizing, and installation, performing wiring and notifying completion of work for single-phase distribution, power and lighting systems.

Unit of Competency 2: Install electrical protective devices for distribution, power, lighting, auxiliary, lightning protection and grounding system. Based on the results of the validation and feedback process, the workbook described as a well-structured and in-depth study for skill development. The contextualized practical skills workbook promotes instructional effectiveness; the teachers are properly guided with learner-centered discussions and activities. The unit of competency 2 is composed of Learning Outcome 2 (LO 2) which covers the installations of electrical protective devices such as fuse and circuit breaker that are performed in line with job requirements and PEC. Learning Outcome 3 (LO 3) consists of the installation of lighting fixtures wherein learners will perform a correct procedure for the installation of lighting fixtures such as incandescent lamp, fluorescent lamp and track lights. One of my respondents suggested adding track lights to my discussion in lighting fixtures to be more updated and to enhance the content of the workbook.

Unit of Competency 3: Install wiring devices of floor and wall mounted outlets, lighting fixtures/switches, and auxiliary outlets. In this unit of competency, the emphasis is on selecting and installing electrical wiring devices and lighting fixtures and switches. It consists of learning outcome 2 (LO 2), Install wiring devices wherein learners are expected to perform the installation of building wiring, closed-circuit television (CCTV), and fire detection and alarm system (FDAS). As suggested by EIM experts, the CCTV and FDAS systems are integrated into Unit 3, specifically under LO2, to align with the TESDA EIM NC II training regulation. The last part of the module

is learning outcome 3, these practical sessions allow learners to perform the installation of lighting fixtures (incandescent lamp), switches such as single-pole switch (S1), three-way switch (S3W), 2-gang switch (S2) and 3-gang switch (S3) and outlets such as a special-purpose outlet (SPO) and convenience outlet (CO). After the validation phase, the expert validator suggested adding an installation of one bulb controlled by two 3-way switches and one four-way switch (S4W) for accuracy and up-to-dateness of information of the workbook.

V. DISCUSSION

Development of contextualized practical skills workbook for electrical installation and maintenance

According to the DepEd Order No. 003, s. 2025, revealed low assessment participation rates for Grade 11 and 12 learners, with only 25% in the School Year 2019-2020 and 6.8% in School Year 2020-2021. However, students also struggle to meet minimum proficiency levels, especially technical and applied skills due to limited practical learning resources (UNESCO, 2023). Rogayan & Dollente (2019) said that the teachers in central luzon developed a research-based, and responsive contextualized workbook to help students improve performance in physical science. This implies that the development of a contextualized practical skills workbook was responsive, research-based, and competency-based and enhanced students' practical skills and ensured readiness for national certificate assessment.

In developmental phase, the content and activities are written, compiled and ensure alignment of every information and activities to the TESDA Training Regulation of EIM NC II, Philippine Electrical Code (PEC) and to essential competencies needed for performing a specific job requirement. The development follows the competency map of electrical installation and maintenance NC II particularly the three units under the core of competencies: (1) perform roughing-in activities wiring and cabling works for single-phase distribution system, power, lighting and auxiliary, (2) install electrical protective devices for distribution of power, lighting, auxiliary and to include lighting protection, and (3) install wiring devices of floor and wall mounted outlets, lighting fixture/switches and auxiliary outlet.

According to TESDA (2015), the core units of competency is the main basis for assessment and the basic and common unit of competency of TESDA Training regulation was integrated or assessed along core units. The workbook also includes pre-test, information sheets, contextualized activity sheets, and post-test. According to Ugot and Pasion (2023), teachers and students use locally-made instructional materials, they had been benefited by acquiring new skills and becoming globally competitive individual.

Teachers' Validation in Contextualized Practical Skills Workbook

In the validation of content, the total score of the workbook's content is 28 out of 28, indicating that it passed the evaluation criteria with maximum passing score of 28 points and a minimum score of 21 points. Also, all indicators were rated 4 (Very Satisfactory). Long (2025) emphasized the need for information such as images, text and videos that are deliberately chosen, delivered, created, and structured to meet user needs and support their objective within an interface. Meanwhile, Manurung (2017), vies that instructional materials are developed to attain the instructional objective. Thus, it is important that the development of IMs must be well planned, designed, and prepared.

In the validation of presentation and organization, the material obtained a total score of 20 out of 20 points, surpassing the minimum score of 15 and a maximum score of 20 All indicators also received a rating of 4, which means very satisfactory. This is consistent with Garcia et al. (2024) found that systematic planning and utilization of learning resources were instrumental in achieving desirable educational outcomes.

In the validation of accuracy and up-to-dateness, the workbook's total score is 23.67 out of 24, exceeding the maximum score of 24 and minimum passing score of 20. This implies that the contextualized practical skills workbook is free from factual, grammatical, computational, typographical, and other minor errors. Moreover, these two indicators received the lowest mean, wherein the conceptual error indicator got a

mean score of 3.88 and the obsolete error indicator got a mean score of 3.79, which means Very Satisfactory.

Based on the result, to avoid obsolete information, the outdated model of fluorescent lamp is removed and replaced by the track lights that are updated and aligned to the industry standards. To free the workbook from conceptual errors, the presentation of content specifically the CCTV and FDAS systems, is moved from unit 2 to unit of competency 3 under the learning outcome 2 (Install Wiring Devices). Arisgado (2022) noted that the availability of localized learning resources under the LRMDS significantly improved teachers' instructional delivery and ensuring the accuracy and up-to-dateness of the material enhance contextual relevance.

Feedback of Teachers in the Development of Contextualized Practical Skills Workbook

Standard-Aligned Focused, and Developmentally Appropriate Contents. The result indicated that the workbook is presented in a logical sequence, progresses from basic to complex tasks, making it suitable for the developmental level of Junior, Senior, and Tertiary electrical students. It is also aligned with the provisions and regulations of as Philippine Electrical Code (PEC), DepEd learning competencies and TESDA Training regulation to help students develop skill development and support EIM learners in preparing for EIM NC II assessment. T-2 mentioned, "The workbook's content is relevant, practical and aligned with the PEC, DepEd and TESDA competencies required in technical-vocational education".

This result corresponds to Bulosan (2023), which indicates that contextualized EIM materials enhance both technical proficiency and employability skills. The workbook also supports inclusive, competency-based, free from ideological, racial and cognitively challenging instruction that prepares learners for certification and workplace demands. T-6 emphasized that the "content ought to use inclusive language that reflect various cultures, religions and gender ensuring all the students can relate". This result corresponds to UNESCO 2023, the SDG 4 indicates that education must be equal, inclusive, promote meaningful and lifelong learning that gives opportunities for all students in the Philippines without biases.

Organized, Readable User-Friendly Physical Design. The results indicates that the workbook's format is well-presented and organized. The letter size, font style and spacing support comfortable reading and the print quality is clear with appropriate contrasting between text and background. The paper quality is suitable for readability, the binding is sturdy and the size is manageable, easy to carry and store in school bags without causing discomfort which enhances usability. T-3 said that "The prints used in the workbook are readable and appropriate for target learners. The letter size, spacing and font style support comfortable reading even for extended study periods. Prints quality is generally clear with sufficient contrast between text and background".

Alarcon et al. (2024) indicated that students need to be ready for work after they graduated in college to enhance skills in technical fields. These results imply the importance of contextualized and validated instructional materials to support learning for assessment, employability, and competence. Ugot and Pasion (2023) explained that by using contextualized instructional materials, learners enhanced and developed practical skills and became competitive individuals.

Systematic, Scaffold and Learner-Centered Instructional Structure. In this study, contextualized workbook enhances educational delivery to include improving cooperation, communication, and skill enhancement for the EIM learners and community. The result indicated that the workbook follows a systematic and well-sequenced discussion of lessons and activities aligned to the core competencies of TESDA training regulation. The logical organization of ideas allows students to build knowledge independently. The workbook is scaffolded, guiding students to gradually builds their understanding about a specific concept. Guided and engaging activity sheets allow learners to independently perform a specific task correctly.

Timperley et al (2007) said that it is important to give teachers the authority to develop their own

instructional materials based on their reflective observation within the school premises to benefit learners and to give solutions to the problems. These results imply that this contextualized practical skills workbook contains an organized idea, well-designed, systematic, scaffold, and learner-centered performance tasks that help enhance students' acquisition of practical skills in electrical installation and maintenance.

Technically Verified, Updated, and Conceptually Sound Material. The results indicated the importance of the accuracy and up-to-dateness of the workbook in strengthening the curriculum and enhancing teachers' instructional delivery. The workbook is based on the updated and reliable sources such as Philippine Electrical Code, DepEd competencies and TESDA Training Regulation of EIM NC II. The workbook is clear, easy to understand, and helpful to follow especially because it explains concepts, measurements, and procedures in a simple and guide way. T-4 said that "The workbook demonstrates grammatical accuracy because it has clear and well-constructed sentences that are easy to understand.

Esmeña and Escoto (2023) point out, instructional materials can give core experiences and learnings to the students which can be applied during the lesson. Thus, the development of this material directly supports the learner's experiential learning by improving the accuracy and up-to-dateness of instructional materials. The use of student workbook can help learners understand the material and provide them numerous chances to demonstrate their knowledge and hone their skills (Karsil and Sahin, 2019).

Therefore, the results imply that school leaders and policy makers under educational sectors have given time in developing and innovate instructional materials that is aligned not only in DepEd MELCS and curriculum guide but directly aligned to the Technical Education and Skills Development Authority Training regulation that serves as the main basis for conducting an Electrical Installation and Maintenance NC II assessment.

Proposed Enhanced Contextualized Practical Skills Workbook

The development of contextualized practical skills workbook, composed of three units of competencies that are aligned to the training regulation of TESDA that serve as a main basis for EIM national certificate II assessment. Each unit of competency directly addresses significant areas of improvement identified in this study's analysis, particularly in the domains of perform-roughing in activities, installation of electrical protective devices, and installation of lighting fixtures, switches, auxiliaries and wiring devices.

According to Sambajon et al. (2023), contextualization helps improve students' practical skills by relating discussions to students' real-life experiences, interest and environment. The enhanced contextualized practical skills workbook is an instructional material that helps students acquire and apply new practical skills and knowledge in not only inside the practical work area but also in the community.

Unit of Competency 1, Perform roughing-in activities, wiring and cabling works for single-phase distribution, and lighting systems, is composed of learning outcome (LO 1), It provides a core understanding of practical skills required for electrical assessment and for employability. The integration of important concepts such as selecting electrical tools and equipment, interpretation of electrical wiring diagrams and mechanical drawings, electrical wiring symbols, selecting and usage of required size of cable based on PEC and proper uses and installation of electrical metallic and non-metallic conduits, these concepts and installation procedures are included and essential in NC II assessment. This addresses current literature that identifies the lack of competence of many students to meet minimum proficiency levels, especially technical and applied skills due to limited practical learning materials and learning resources (UNESCO, 2023).

Unit of Competency 2, Install electrical protective devices for distribution, power, lighting, auxiliary, lightning protection and grounding system, focuses on the application of electrical protective devices (e.g.,

fuse and circuit breaker) and installation of lighting fixtures and informing completion of work for distribution, power, lighting, and grounding systems. In addition, the track light is already included in the discussion of lighting fixtures suggested by one of my respondents and for the up-to-datedness of information. The learning material indicates that workbook goes beyond theory by incorporating practical tools and exercises that allow EIM learners to apply what they learned in real-world scenarios. The instructional materials are developed to facilitate the attainment of instructional objective (Manurung, 2017).

Unit of Competency 3, Install wiring devices of floor and wall mounted outlets, lighting fixtures/switches, and auxiliary outlets, equips EIM learners with the skills to use in national certificate II assessment. By equipping students with the correct installation procedures of wiring devices such as auxiliaries (e.g., closed-circuit television and fire detection and alarm system), lighting fixtures and different types of switches help electrical students to be ready for assessment and employability. Moreover, as suggested by one expert validator, the installation of one bulb controlled by two 3-way switches (S3W) and one four-way switch (S4W) is already added to the workbook under the Unit of Competency 3 (UC 3) and Learning Outcome 3 (LO 3). This underscores that the proposed enhancement of workbook promotes learning through experience and application. Kolb's Experiential Learning Theory (1984) highlighted that learning is an active process shaped by concrete experience, reflective observation, and abstract conceptualization.

Its wider significance is that it can provide contextualized activities, meaningful, real-world learning experiences that support students to be competent and help teachers guide positive changes in learning. The three units of competency in the contextualized practical skills workbook indicates how practical skills, connected to educational policies and theoretical frameworks, build students' knowledge and skills. Each unit focuses on specific learning outcomes that have appropriate and clear content, well-structured and designed format, logical presentation and organization and accurate, up-to-dateness information.

The learning material indicates that the concepts and activities in unit of competency 3 (UC 3) are one of the most essential parts of the electrical installation and allow learners to develop technical competence. The results indicated that the workbook helps electrical installation and maintenance (EIM) students to be equipped with the technical skills and work attitudes needed for competency-based assessment and future employment.

VII. CONCLUSION AND RECOMMENDATION

Based on the findings of the study, several conclusions were drawn in alignment with the research objectives. The study found that the developed contextualized practical skills workbook indicates an effective, competency-based, and systematically structured learning resources that enhances the practical skills, knowledge, and assessment readiness of Senior High School electrical learners, following the phases of ADDIE model.

The study also concluded that the workbook's validation across factors met the standards set by the LRMDS evaluation rating sheet for print resources. In Factor 1(Content), the workbook was rated Very Satisfactory , the workbook was appropriate for the students' level of development, promote higher order thinking skills, free from ideological, racial, and gender biases, improving desirable values and traits, stimulates learners' interest, and provides safety in installation process. Factor 3 (Presentation and Organization) obtained a Very Satisfactory rating, which implies that the workbook is attractive, systematize, organize, understandable, vocabulary and sentence structures is suited to the electrical learners, and Factor 4 (Accuracy and Up-to-Datedness of Information) was also rated Very Satisfactory, indicating that the workbook is free from conceptual, factual, grammatical, computational, and typographical errors and does not contain obsolete information. The study found out that the developed workbook passed the required passing score in LRMDS which means that the EIM experts approved the material for possible use in public schools.

Thematic analysis revealed that the workbook is standards-aligned focused and developmentally appropriate contents, Organized and Readable User-Friendly Physical Design, Systematic and Learner-Centered Instructional Structure, Technically Verified, updated, and Conceptually Sound Material. Electrical Teachers emphasized that the workbook helps learners to develop practical skills in electrical technology. Lastly, the findings of quantitative and qualitative guided the development of a proposed contextualized practical skills workbook. The proposal aimed to enhance technical competence, particularly in increasing the participation and passing rate in electrical installation and maintenance (EIM) national certificate II assessment. The proposed contextualized practical skills workbook includes: (1) Perform roughing-in activities, wiring and cabling works for single-phase distribution, power, lighting and auxiliary systems, (2) Install electrical protective devices for distribution, power, lighting, auxiliary, lightning protection and grounding system, and (3) Install wiring devices of floor and wall mounted outlets, lighting fixtures/switches, and auxiliary outlets. These units of workbook are intended to address observed gaps and support sustainable electrical technology integration in classroom environment and community.

In line with the findings, the following recommendations were outlined. It is suggested that the public schools may adopt the contextualized practical skills workbook that is based on LRMDS to further develop students' practical skills and technical competence during national certificate assessment. Future researchers may use other variables other than LRMDS in validating the workbook. School leaders in schools across Sorsogon may also consider supporting the use and possible adoption of the workbook as an additional learning resource for technical-vocational subjects. Considering the effectiveness of the workbook in improving practical skills in electrical installation and maintenance NC II, the future researcher can expand and develop similar contextualized, competency-based workbooks for other technical-vocational subjects within the Senior High School curriculum, especially TVL courses that are required to perform hands-on learning. It may also be considered to develop a contextualized workbook that uses original activity photos taken by the author itself. Further, additional studies may also be conducted to determine the validity of the workbook in improving students' practical skills and competence, and readiness for competency assessment such as national assessment II certification.

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