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Assessment on Electrical Installation and Maintenance (EIM) Delivery among Technical Vocational Livelihood Students

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Abstract

The study investigated the assessment on electrical installation and maintenance on the basic standard core competency and level of knowledge and skills on safety measures and procedures for electrical installation and maintenance of the knowledge and skills assessment among TVL students. Descriptive quantitative research design employed in the measures of the study and purposive sampling was gathered for the sample population of the respondents. The study comprised twenty-nine (29) respondents only. Findings showed that knowledge and skills assessment on electrical installation and maintenance of TVL students evaluated the success program in electrical installation and maintenance, involved and confirms teachers for proper registration and training programs in electrical installation and determined the course type of development assessment instruments and implementation of the work practice among students. It also showed that basic core competency of knowledge and skills assessment in terms of critical aspect of competency developed

technology, resource application utilized the system, methods of assessment process presented a model of training in technology of electrical installation and maintenance, context of assessment required intensity on multifaceted and electrical installation process and content, and safety procedures provided electrical installation on the increased capacity and maintenance of the trends and process of safety procedures. Similarly, the level of knowledge and skills safety measures and procedures identified hazards and risks constructed the TVL subject on hazards and risks as safety of students during electrical installation actual activities, evaluation of hazards and risk verified the system of hazards and risks evaluation techniques that applied to some aspects and consideration of hazard process and risk, and control of hazard and risk provided limitations to overcome the control of hazards and risks for students during actual activities in electrical installation and maintenance.

Keywords: Education, Assessment on Electrical Installation and Maintenance, Basic Core Standard of EIM, and Level of Assessment on Safety Procedures of EIM

1. Introduction

Knowledge and skills assessment on electrical installation and maintenance among Technical Vocational Livelihood students exposed the global situation and analysis in the study which are necessary in the Senior High School strand because it prepares them for the improvement of their soft and hard skills in various ways (Rosales, 2022) ^[74]. This can be observed globally not only in the educational setting in the Philippines. The TVL strand is designed based on the practice globally where it is adopted in the educational setting in the Philippines. It highlights the cost and assumption on the maintenance of electrical installation and availability (Victoria, *et al.*, 2021) ^[88]. It characterizes the improved effect of electrical installation of the global hydropower in the existing reservoirs that provide solar compensation on the current sustainable electricity (Sanchez, *et al.*, 2021) ^[76]. Developing the skills and performance of electrical installation globally can support the future and advance career of students (Jaiyeola Onipede, 2021) ^[38]. It improves TVL students' participation in the educational opportunities. It develops skills and technical abilities in their strands. It explores knowledge and task performance associated with electrical job requirements. It helps students maintain their development in relation to electrical installation and maintenance globally (Lew, *et al.*, 2021) ^[48]. It trains them to seek the basic skills on specialized electrician skills and opportunities. It builds and continues to set the skills needed that help TVL strand students in their advanced roles and specialized skills. Some specialized skills include maintenance and construction of electrical work. This has been proven by the study of (Lew, *et al.*, 2021) ^[48] on the influence of development power generation on electricity installation that offers less expensive electricity sources globally. It helps in the transformation of a sustainable energy system that can be learned by the students. It develops globally the

renewable energy electrification, installation, and integration (Bamisile, *et al.*, 2021) ^[8]. This is not limited to skills in electrical systems, troubleshooting, construction projects, upgrades, and repairs. It provides TVL students with training opportunities where they can learn electrical components and potentials. It evaluates the goals of acceptable instructional teaching and training for electrical installation and maintenance of students in the TVL strand. The students are being taught proper maintenance and installation in the electrical process (Turoń, Kubik, & Chen, 2021) ^[87]. It implements the solution in new mobility of electrical installation that will bring an advantage in the global world to improve the system and quality process of electrical maintenance and installation. It provides support and promotion in the scarcity of education among students on electrical installation and mobility processes with the use of technology in the global world. The goal is to identify the electrical installation and maintenance among TVL students which focuses on their life-long learning process (Shodipe, & Ohanu, 2021) ^[81]. It modifies and adapts instructional training that determines electrical installation effectively, user friendly, safety, functionality, and workmanship (Saro, *et al.*, 2022) ^[78]. It develops the teachers in the assessment process and knowledge skills for electrical installation and maintenance as evaluated by the professionals and competencies in learning (Rosales, 2022) ^[74]. Hence, it assesses the implementation status of the TVL strand in the Department of Education. It guides and serves for the implementation in the curriculum of TVL programs. It shows that TVL strand implements electrical installation in the area of equipment and facilities, industry partnership and preparedness, learning and workplace environment, imposition and instruction by the school and TVL teachers (Ferrer, 2022) ^[26]. It also examines the link and resources on the behavioral factors of students and their intention to learn in the electrical installation and maintenance process which is defined and controlled among teachers globally. This has enhanced the institutional training of teachers and management to motivate students in their learning process (Ohanu, & Shodipe, 2021) ^[61]. In addition, it provides technical support and achievement in the educational setting for TVL strand. It identifies proper strategies for students in TVL strand particularly in the area of electrical installation and maintenance. It encourages students to retain instructional delivery for the learning process as part of the curriculum (Oladimeji, *et al.*, 2021) ^[64]. Similarly, TVL is one of the programs in the Senior High School strand not only in the Philippine educational setting but throughout the world. It is designed to provide manpower and technical skills for the future generation with proper craft for job opportunities in both private and public sector. It intends to assess the need and technical competency for electrical installation and maintenance in TVL strand and module of the learners (Shanga, 2021) ^[80].

On the other hand, the knowledge and assessment skills on electrical installation in the ASEAN situation where it provides TVL students the training opportunities to pursue their soft and hard skills (Hanafi, Febriana, & Zakir, 2021, March) ^[34]. It provides training for students in the TVL strand. This can be developed as part of competency and self-reliance in response to technical skills in electrical installation and maintenance. It prepares students to enhance competency and learning process (Pereyras, 2021) ^[71]. It describes a scheme for TVL strand on electrical installation

and maintenance process which assesses the learning competency of student's eligibility (Laras, & Sukisno, 2021) ^[46]. It produces expectations in the quality of education such as competency in the ASEAN situation and analysis as to work competency, knowledge, skills on electrical installation and maintenance as requirements in the adjustment of the global community and sustainability. It ensures and applies the program of TVL in electrical installation and maintenance that focuses on the qualification and activities to improve learning competency, collaboration, and strategy (Mukhaiyar, Muskhair, & Dolly, 2019) ^[57]. It provides design in TVL strand curriculum in all ASEAN because they have programs to implement. The programs are based on the needs of students as compared to the Philippine setting in the TVL education process. It corresponds to the initiated program for TVL students center of excellence (Daskalov, *et al.*, 2021, September) ^[19]. This is typically through performing the soft skills on personal development and personal jobs. This depends on the soft skills they need in electrical installation to build and to find the privilege in training. This can be done in school curriculum for Senior High School strand (Daumiller, *et al.*, 2021) ^[20]. The instruction coming from the Department of Education system in the Philippines raises different issues in the curriculum for electrical installation and interpretation based on the needs of students and community for career path. The knowledge and skills assessment goals are to analyze the electrical installation and maintenance for teachers and students. It prepares students for deeper learning (Darling-Hammond, & Oakes, 2021) ^[18]. This also examines TVL teachers to experience the outcome of motivation they give to students for better competency in electrical installation and maintenance which is one of the goals in the learning process perceived for positive challenges and useful development of competency skills (Tan, 2021) ^[86]. It influences the flow of the globalization in electrical installation and maintenance in the industrial revolution to include the educational and vocational sector and TVL strand as to technology-based learning. It is the challenge of TVL teachers for the learning mastery and skills in the TVL subject (Manlangit, 2022) ^[52]. It is the challenge of TVL in the new normal among Senior High Schools. TVL teachers are required for dynamic learning activities especially in the implementation of electrical installation and maintenance to transfer knowledge of students for better skills in the subject. It is the process and ability to use readily the execution and performance effectively (Santos, 2021) ^[77]. It provides technological awareness on proper skills in electrical installation and maintenance literacy for students who are enrolled in TVL strand as part of the curriculum, technological capability, and creativity which is needed for the skills of students. It shows the category and capacity of TVL teachers the need for improved process of teaching competency, motivation, self-development in the improved technology skills and training program (Mutohhari, Sofyan, & Nurtanto, 2021) ^[58]. It examines the TVL curriculum program on electrical installation and maintenance across the globe. It analyzes the theories and philosophies of TVL electrical installation and maintenance that have been designed for student development and skills. It prepares TVL teachers with personal awareness and pragmatic skills in accordance with the principles of electrical installation and maintenance as part of the commitment to quality education (Hew, & Brush,

2007)^[36]. It governs the logic and identifies the design, evaluation, construction, and knowledge transmitted by the TVL teachers in the class of electrical installation and maintenance through technical approach on knowledge and skills-based assessment (Bibi, Anwar, & Rana, 2021)^[14]. The knowledge and skill assessment of electrical installation and maintenance design learning communication and sequence based on the goals and integration utilization of lessons. The knowledge transmission of electricity and installation maintenance provides competency-based teaching in TVL strand. It provides pedagogical innovation in the organizational improvement condition in school and necessary application of TVL strand on knowledge and skills assessment (Malonda, 2022)^[51]. Moreover, the knowledge and assessment skills on electrical installation directs and analyzes the application and instruction of electrical installation and maintenance in the improvement and learning model of students in electrical installation and maintenance outcome. It carries the cycles of reflection stage, observation, implementation, and planning (Atnangar, *et al.*, 2022)^[6].

Notably, when comparing electrical installation and maintenance from the global context and ASEAN context. They have one distinct feature in the process, adoption, and implementation. They all identify the gaps, issues, and challenges in electrical installation and maintenance. The process is the same, but the implementation is different due to the needs and capacity of students (Mariya, & Neviyarni, 2021)^[53]. Likewise, with the process of teaching among TVL teachers since they have different techniques in teaching to where the competency of learning is being emphasized. This is based on the domain and structure of teaching and learning in the academic performance of students in TVL especially on the domains as to affective, cognitive, and psychomotor skills which is relevant to TVL subject (Mallillin, *et al.*, 2021)^[50]. It aims to implement the assessment in the challenges, issues in the implementation of electrical installation and maintenance of TVL in the Senior High Schools. It serves as a guide to administer the process despite the success and hurdles of the program (Fontanos, *et al.*, 2020)^[27]. It provides options in the challenges and issues in the flexible learning process of the Basic Education for TVL strand and implication for Senior High Schools. It provides implementation on TVL in terms of facilities, industry preparedness, equipment, partnership, learning environment, workplace, environment, and instruction perception imposition by teachers (Saro, *et al.*, 2021). It is a valuable knowledge and essential experience of Senior High Schools in TVL electrical installation and maintenance on the educational system despite challenges due to the facilities and equipment being utilized in the learning process. It transitions students in the learning process to include program and training skills (Orbeta, & Corpus, 2021)^[68]. Indeed, Technical-Vocational-Livelihood (TVL) Track as to electrical installation and maintenance challenges the teachers in various perspectives on the evaluation of TVL implementation in the Senior High Schools in the Philippine educational system especially the Department of Education (Grustan, & Buniel, 2022)^[31]. Some students are facing constraints in the time availability due to limited facilities for hands-on process in electrical installation and maintenance. The hallmark is focused on the work readiness, practical skills, and challenges. Practical skills in electrical installation and maintenance are acquired

through actual doing and performance where the assessment of skills can be measured on students output and performance (Nebrida, Amor, & Mazorca, 2022). It aligns the evaluation and analysis gap based on the curriculum of TVL strand. It examines the analysis guidelines and policies in the pedagogy and technology of the content requirements in TVL as reflected in electrical installation and maintenance for students (Cortes, Pineda, & Jugar, 2022)^[17]. It contributes to the module effect and completion of TVL among Senior High Schools regarding electrical installation and maintenance (Sumandal, 2022)^[84].

Finally, the study is worth doing because it provides scope, solution, and possible implication on the analysis of TVL strand on electrical installation based on the electrical standard. The TVL students are aware of the electrical standard and performance in the work of electrical installation. It ensures the task and code of conduct efficiently and effectively for safety. This ensures that technical knowledge must be upgraded based on the trends of electrical installation standards. It helps them to learn the need and new techniques to adapt the method to the skills set in electrical installation. The electrical installation and maintenance carry the application and technology teaching and learning in the present era setting which promotes substantial quality of education among TVL strand teachers. It determines efficiency and acceptability of the development learning and teaching process through electrical supplies, materials, and specification for the learning outcome and enhancement. It investigates and analyzes the assessment outcome impact of electrical installation and maintenance process. It develops the demonstration of proper electrical installation and maintenance for expert's teachers and students in TVL strand. It employs development of quality in teaching technical, and instructional content. It utilizes the outcome of learning competency in electrical installation and maintenance courses of students (Grustan, & Buniel, 2022)^[31]. Yet, it is calculated based on technology of teaching in the latest trend for electrical installation and maintenance in the Department of Education. It carries the standard process of teaching electrical installation and maintenance in actual process. It increases the formation and capacities of the latest trend in teaching electricity and installation maintenance effectively (Soluyanov, *et al.*, 2021)^[82]. It also provides a significant contribution of glaring knowledge skills and assessment on electrical installation and maintenance among TVL students equipped with productive skills and the system process. It emphasizes the implementation of effective installation of electrical skills in the educational system especially in the Department of Education. The TVL education for students' relevance to the application of electrical installation demonstrates thinking habits acquisition of knowledge and skills in electrical installation. The skills development and acquisition sustain the credence and advance improvement of TVL students' potentials (Moses, *et al.*, 2021)^[56]. It sustains the level and raises challenges in the acquisition of knowledge and skills. It is a technical skill that integrates theoretical knowledge on electrical installation, practical work, and observation sense of skills. Though it contributes to various challenges, the requirements in electrical installation and maintenance integrate global competition among TVL students in a sustainable practice. It enhances positive sustainability on the growth and experiences of the electrical installation and

maintenance operation process that remains unexplored due to the trend of technology at present. It examines and implements critical success of sustainable learning enhancement of student's techniques and decision making. It facilitates electrical installation and maintenance as to commitment and competitive advantage of the quality graduates of TVL track (Mathiyazhagan, Gnanavelbabu, & Agarwal, 2022) ^[54]. Indeed, the basic knowledge and needs in electrical maintenance and installation is necessary for the home and family especially on safety processes. This includes household appliances and ensures longevity. Neglected maintenance and electrical faulty will cause a potential for sparks and electrocution, short circuits, electrical fire, and damages of the appliances at home. Electrical installation and maintenance entails current electrical testing to ensure the overall system and running smoothly. Monitoring the escalated potential issues and effect of faulty electrical installation. Fixing electrical elements and faulty wiring so that the system in electrical processes runs intendedly. Hence, proper electrical installation and maintenance anticipates safety measures and precautions. It evolves in an improvement approach on innovation and practical outcome learning among TVL students. It integrates electrical installation and maintenance on the effect of pedagogy and innovation among TVL students. It adopts a teaching and innovation approach on the learning outcome of student improvement resources which is limited in electrical installation and maintenance among them (Olelewe, *et al.*, 2021) ^[66]. It has practical implications for TVL teachers based on the work trade on electrical installation maintenance and impact (Gueye, Kebe, & Diop, 2021) ^[32]. Notably, electrical installation and maintenance to be taught among TVL students provides the proper skills in the strand since it is a part of the curriculum process and design in the Senior High School strand. Electrical installation and maintenance means lighting or power, fixture for heating and devices, fitting, electrical conductors, regardless of the voltage. It is a kind of partition, and hardware which is an integral part of electrical installation and maintenance among TVL students where they can be assessed on skills and knowledge. It explores and focuses on the experiences of TVL students in a positive approach and integration of classroom setting in teaching. It applies and reveals the integration method of positive approach to ensure that there is long-term goal setting, and structure. It overwhelms the TVL teachers in the fulfillment experiences of effort and impact in the improved academic performance of students. It engages the level of academic transformation in the behavior of TVL students in Senior High School track in the Department of Education (Soriano, & Soriano, 2022) ^[83]. It applies the integration of subjects in the curriculum for TVL in various responses to electrical installation and maintenance. It manifests the observation of unfavorable response to student appreciation, engagement in the completion output of the course (Canete, 2022). Finally, the rationale of electrical installation and maintenance ensures that the process is kept in order during the process. This includes testing an inspecting especially on the equipment and necessary needful for electrical installation and maintenance to avoid issues that will lead to loss of connection, power, and fire. It is important to note that students need to ensure their safety as they follow the protocols in the actual process of electrical installation and maintenance. Hence, maintenance can be conducted by the

personnel involved in the process who are knowledgeable. This ensures the work environment and safety is being maintained as to safety rules, and implementation in the working area. It is simply the process of maintenance and electrical installation to include that task of safety, inspecting electrical system, replacing, and repairing the equipment damaged, and installing wiring (Olelewe, *et al.*, 2021) ^[66].

Similarly, the gaps, issues, and challenges of electrical installation and maintenance are stressful mistakes especially when electrical work and installer has no idea on the process that resulted to faulty connection. It is extremely dangerous and hazardous that threaten the place of installation as to building or any kind of infrastructures. Electrical installation and maintenance issues can be overlooked and dangerous such as insecure wiring that can cause the appliance and lighting to break down powered with electrical fire and issues, wrong sizes of wiring which can cause to possible overheating, length improper wire which causes short circuits and interruption of connection, unprotected wiring which exposes to tampering and harsh weather, and connection which causes overheating and arcing that can lead to personal injury and fires (Fan, *et al.*, 2021).

Notably, the objective of the study is to focus on the knowledge and skills assessment on electrical installation and maintenance among TVL students. Specifically, it aims to answer the knowledge and skills assessment on electrical installation and maintenance of TVL students in the area of competency assessment and certification, registration and delivery of training programs, and development of curriculum and assessment instruments. Likewise, to examine the basic standard core competency of knowledge and skills assessment on electrical installation and maintenance of TVL students in terms of critical aspect of competency, resource application, methods of assessment, and context of assessment. This includes the level of knowledge and skills on safety measures and procedures for electrical installation and maintenance of the knowledge and skills assessment among TVL students on the aspect of safety procedures, identity hazards and risks, evaluation of hazards and risk, and control of hazard and risk.

2. Methodology

The study employed the descriptive quantitative research design because it quantifies and measures the knowledge and skills assessment on electrical installation and maintenance of TVL students in the area of competency assessment and certification, registration and delivery of training programs, and development of curriculum and assessment instruments, (Duckett, 2021) ^[22]. Likewise, to measure and quantify the basic standard core competency of knowledge and skills assessment on electrical installation and maintenance of TVL students in terms of critical aspects of competency resource application, methods of assessment, and context of assessment. This includes the safety measures and procedures for electrical installation and maintenance of the knowledge and skills assessment among TVL students on the aspect of safety procedures, identity hazards and risks, evaluation of hazards and risk, and control of hazard and risk. According to (Bauer, *et al.*, 2021) ^[12] they stressed that quantitative research is systematic review in the application of method and theory. It is rooted with theory and framework in the human experience and social position

in the study under investigation. This is to ensure the understanding and key features of the defined analysis of quantitative research design and practices to include the improved and analysis of the adapted and developed quantitative methods and approach. It involves techniques in statistical analysis and practices (Rashid, & Sipahi, 2021). It is a design that develops the evaluation and model of electrical installation and maintenance programs for teachers in TVL. It evaluates students' electrical installation practice and activities program set in TVL subject. It also analyzes the development model and consistency of the input, process, and output of electrical installation and maintenance to meet practical aspects and effectiveness of the process (Remler, & Van Ryzin, 2021) ^[72]. It is a teaching experience that describes the descriptive quantitative research in electrical installation and maintenance for both student and faculty experiences. It enhances awareness of students' learning experiences in electrical installation and maintenance measures of the study (Jenkins, *et al.* 2021) ^[40]. The setting of the study is at Luakan National High School, Magsaysay National High School, and Pagalangang National High School, Dinalupihan District, Bataan, which aim to fulfill the vision and mission of the Department of Education by making sure that students make a meaningful contribution to the development of the country and by fostering quality education, a motivating environment, nurturing each student, and engaging lifelong learners in electrical installation and maintenance among TVL students. It is conducted for the academic school year 2022-2023. The study comprised twenty-nine (29) respondents only. On the other hand, purposive sampling technique is utilized in the study. It is the process of finding the number of sample sizes in the study. Purposive sampling is straightforward and simple in various aspects and complexities. It is better matching in selecting the sampling techniques, aims, and objectives. This has to do with the concept and aspect of purposive sampling techniques as to confirmability, dependability, transferability, and credibility. It provides purposive sampling that highlights the integration of the research design and context. It provides strategies on the collection of data, trustworthiness, and analysis (Campbell, *et al.*, 2020) ^[15].

3. Results and Discussion

3.1 On the knowledge and skills assessment on electrical installation and maintenance of TVL students

Table 1 presents the weighted mean and the corresponding interpretation on the knowledge and skills assessment on electrical installation and maintenance of TVL students in the area of competency assessment and certification among the respondents.

It shows that "The competency assessment and certification evaluates the success of the program in electrical installation and maintenance", with a weighted mean of 4.34 or Strongly Agree which means that the success of electrical installation and maintenance is based on the programs and success in TVL among the respondents. It also shows that knowledge and skills is "It prepares job openings and answers unemployment workforce as part of the assessment and certification competency", with a weighted mean of 3.14 or Moderately Agree which workforce and assessment certificate competency is part of the evaluation and process of TVL among students. This has been proven by the study (Wahyuningsih, Darmawan, & Abi Hamid, 2021) ^[91] on the

electrical installation and evaluation training found out that the result explores in the evaluation process especially in the training support on technicalities. This includes the aspect and bases on context, outcome, input, product, process in the training of students. It indicates an evaluation model in the setting, product, and process that will result in satisfaction to include the outcome and input in the poor category. It remains a limited implementation and input outcome for the program of the training process. The electrical installation is extended training of the program that strengthens the input side of infrastructure and facilities to maximize labor process especially among student trainees.

Table 1: Knowledge and Skills Assessment on EIM of TVL Students in the Area of Competency Assessment and Certification

Indicators	WX	DR
1. It provides workforce on development of critical positions to electrical installation assessment.	4.14	A
2. It prepares job openings and answers unemployment workforce as part of the assessment and certification competency.	3.14	MA
3. The competency assessment and certification evaluates the success of the program in electrical installation and maintenance.	4.34	SA
4. It establishes a program to be carried for set activities program and evaluation in the level of success and implementation.	4.00	A
5. It provides information on the essence of assessment that can be utilized in the decision making on electrical installation and maintenance.	4.17	A
6. It analyzes the application of competency assessment and certification for the option of electrical installation and maintenance for teachers and the course.	4.00	A
Average Weighted Mean	3.97	A
Standard Deviation	1.548	

The overall average weighted mean is 3.97 (SD=1.548) or Agree on the knowledge and skills assessment on electrical installation and maintenance of TVL students in the area of competency assessment and certification among the respondents.

Findings show that competency assessment and certification provide an option for teachers and competency-based application in education for electrical installation. It highlights the techniques, direct observation for the content analysis and process of assessment competency. It is designed for the learning process in utilization and integration of the lesson (Malonda, 2022) ^[51].

Table 2 presents the weighted mean and the corresponding interpretation on the knowledge and skills assessment on EIM of TVL students in the area of registration and delivery of training programs among the respondents.

It shows that "It involves and confirms teachers for proper registration and training programs in electrical installation and maintenance", with a weighted mean of 4.31 or Strongly Agree which means registration and delivery of training programs involves and confirms electrical installation and maintenance training programs. It also implies that "It ensures proper development for training programs suitable in development of teaching aids", with a weighted mean of 3.31 or Moderately Agree which means the training program has to do with the registration and delivery of EIM of TVL students. The overall average weighted.

Table 2: Knowledge and Skills Assessment on EIM of TVL Students in the Area of Registration and Delivery of Training Programs

Indicators	WX	DR
1. The registration and delivery of training programs is operated on the instruction, steps, processes, functions, and diagrams of electrical installation and maintenance.	4.14	A
2. It develops teaching aids for delivery of training programs to improve student skills and enhancement development design in teaching tools for learning.	3.41	A
3. It ensures proper development for training programs suitable in development of teaching aids.	3.31	MA
4. It helps to provide concepts on the system of electrical installation for both practice and theory.	4.07	A
5. It involves and confirms teachers for proper registration and training programs in electrical installation and maintenance.	4.31	SA
6. It is observed that delivery of training programs in electrical installation provides success and intervention for the facilities and system.	4.00	A
Average Weighted Mean	3.87	A
Standard Deviation	0.411	

mean is 3.87 (SD=0.411) or Agree on the knowledge and skills assessment on EIM of TVL students in the area of registration and delivery of training programs among the respondents.

Findings show that registration and delivery of training programs for electrical installation and maintenance has an impact on electrical installation quality and timeliness. It provides training programs on the implementation process of facilities in electrical installation and maintenance for quality of light and reliability. It provides a complete training program for the system of electrical installation power and devices. The delivery of registration on training program provides effectiveness and outcome for adequacy light based in the process of electrical installation and maintenance. It is observed that delivery of training programs in electrical installation provides success and intervention for the facilities and system. The electrical installation is necessary in the registration and delivery training program for students because it is a part of the learning process and assessment. It meets the requirements for the registration process and training development of TVL students in electrical installation and maintenance (Rokicki, *et al*, 2021) [73].

Table 3 presents the weighted mean and the corresponding interpretation on the knowledge and skills assessment on EIM of TVL students in the area of development of curriculum and assessment instruments among the respondents.

It shows that “It determines the course type of development assessment instruments and implementation of the work practice among students, with a weighted mean of 3.79 or agree which means the curriculum and assessment of instruments are being practiced by TVL students in preparation of their skills in the future. It also shows that “It

provides electrical installation illumination on assessment instrument portfolio that provides industrial work practice on competency as part of activities and implementation in the lesson”, with a weighted mean of 3.00 or Moderately Agree which means TVL students are given background of electrical installation and maintenance in their lessons. The overall

Table 3: Knowledge and Skills Assessment on EIM of TVL Students in the Area of Development of Curriculum and Assessment Instruments

Indicators	WX	DR
1. It provides electrical installation illumination on assessment instrument portfolio that provides industrial work practice on competency as part of activities and implementation in the lesson.	3.00	MA
2. It develops to cover the aspect of curriculum assessment instruments such as motor skills, attitude, and knowledge of students.	3.14	MA
3. It analyzes the development of curriculum and assessment instruments based on the condition of the industry, situation, needs, and time availability.	3.07	MA
4. It determines the course type of development assessment instruments and implementation of the work practice among students.	3.79	A
5. It arranges sustainable and interconnection of the standard sustainable unit for student assessment and competency measure and achievement.	3.28	MA
6. It validates the content and materials that can be utilized during the assessment instrument for curriculum development in the activities and industrial work practice.	3.10	MA
Average Weighted Mean	3.23	MA
Standard Deviation	0.291	

average weighted mean is 3.23 (SD=0.291) or Agree on the knowledge and skills assessment on EIM of TVL students in the area of development of curriculum and assessment instruments among the respondents.

Findings show that development of curriculum and assessment instruments in electrical installation validates the development of practice skills in building the services on assessment instruments in electrical installation. It provides proper requirements for development curriculum and assessment instruments for Senior High School students. It validates the instrument assessment and development for practical skills of students in building the TVL strand for electrical installation (Okoye, & Auta, 2021) [63].

3.2 On the Basic Standard Core Competency of Knowledge and Skills Assessment on Electrical Installation and Maintenance of TVL Students in Terms of Critical Aspects of Competency Resource Application, Methods of Assessment, and Context of Assessment

Table 4 presents the weighted mean and the corresponding interpretation on the basic core competency of knowledge and skills assessment on EIM of TVL in terms of critical aspect of competency among the respondents.

Table 4: Basic Core Competency of Knowledge and Skills Assessment in Terms of Critical Aspect of Competency

Indicators	WX	DR
1. It develops technology in the critical aspect of competency in the field of electrical installation as a challenge for students and skills.	4.28	SA
2. It enhances the need of TVL students to determine the competency and theory knowledge on domestic industrial electrical installation requirements.	4.03	A
3. It determines technical knowledge on electrical installation as critical aspect competency of students as part of evaluation and measures.	3.07	MA
4. It shows that students are required to undergo the critical aspect of competency based on theory and knowledge for effectiveness and efficiency in electrical installation among them.	4.00	A
5. It facilitates the process of learning and acquisition of training such as habits and beliefs, values, knowledge, and skills.	4.03	A
6. It provides transformation on dynamic instruments in critical aspects of competency in the development of learning of students.	3.86	A
Average Weighted Mean	3.88	A
Standard Deviation	0.419	

It shows that “It develops technology in the critical aspect of competency in the field of electrical installation as a challenge for students and skills”, with a weighted mean of 4.28 or Strongly Agree which means critical competency is very challenging among students as part of their assessment. It Also shows that “It determines technical knowledge on electrical installation as critical aspect competency of students as part of evaluation and measures”, with a weighted mean of 3.07 or Moderately Agree which means the critical competency measures and evaluate the readiness of students in electrical installation and maintenance. The overall average weighted mean is 3.88 (SD=0.419) or Agree on the basic core competency of knowledge and skills assessment on EIM of TVL student in terms of critical aspect of competency among the respondents.

Findings show a critical aspect of competency is designed as a kit for electrical installation which is useful for students. It provides effort and competency to strengthen the expertise or students to pursue learning experiences in electrical installation and optimization. It strengthens students for utilization and effort of learning competency and critical aspects in electrical installation skills thinking and process. It produces critical aspects on the basic electrical installation and maintenance subject. It provides analysis on different competency skills on implementation and technicalities as to electrical installation and maintenance (Anwar, *et al.*, 2021) [5].

Table 5: Basic Core Competency of Knowledge and Skills Assessment In Terms of Resource Application on Electrical Installation and Maintenance

Indicators	WX	DR
1. The resource and application concentrates on electrical installation and maintenance.	3.05	MA
2. It is a system in the utilization of energy as to various collections of technologies and resources.	4.21	SA
3. It provides requirements in the capabilities of electrical installation process for students in TVL strand.	3.86	A
4. It holds electrical installation for particular resource applications that are substantial requirements in the process.	3.90	A
5. It develops reliable resources and application in electrical installation and maintenance for the best quality and information process and availability.	3.86	A
6. It describes regulation of resource and application in electrical installation and maintenance design and description.	4.17	A
Average Weighted Mean	3.84	A
Standard Deviation	0.411	

Table 5 presents the weighted mean and the corresponding interpretation on the basic core competency of knowledge and skills assessment in terms of resource application on EIM among the respondents.

It shows that “It is a system in the utilization of energy as to various collections of technologies and resources' ', with a weighted mean of 4.21 or Strongly Agree which means resource application EIM provides different application based on technology advances and resources where students are equipped with better knowledge. It also shows that “The resource and application concentrates on electrical installation and maintenance”, with a weighted mean of 3.05 or Moderately Agree which means the electrical installation and maintenance focus on various applications of the program implemented in TVL among students. The overall average weighted mean is 3.84 (SD=0.411) or Agree on the basic core competency of knowledge and skills assessment in terms of resource application on EIM among the respondents.

Findings show that resource application on electrical installation is mounted and structured on the remote-control process. It provides resources and application on the miniature transformers and replacement achievement sensors on electrical installation and maintenance. It emphasizes the required special design in mounting electrical installation models and proposals. It connects the microcontroller and electrical installation that allows the process practice for students learning. It describes regulation of resources and application in electrical installation and maintenance design and description. It is the basis for

protection on resource application mounted on electrical installation and maintenance (Issabekov, *et al.*, 2021) ^[37].

Table 6: Basic Core Competency of Knowledge and Skills Assessment on EIM of TVL Student in Terms of Methods of Assessment Process

Indicators	WX	DR
1. It structures the methods of assessment on identified content procedure and motivational process of electrical installation and maintenance.	4.00	A
2. It provides a model of method assessment on the task, purpose, and normative based on electrical installation for students.	3.27	MA
3. It contains a system, information, and criteria of electrical installation and readiness commission with self-assessment of students, formation level, control procedure of the methods and contents.	4.14	A
4. It implements a practical model and methods of assessment	3.93	A
5. that involves learning process, method of appropriate tools and learning to ensure the readiness of formation for electrical installation activity.		
6. It presents a model of training in technology of electrical installation and maintenance.	4.21	SA
7. It provides an opportunity for methods of assessment to assess electrical installation for its effectiveness and efficiency.	3.93	A
Average Weighted Mean	3.88	A
Standard Deviation	0.412	

Table 6 presents the weighted mean and the corresponding interpretation on the basic core competency of knowledge and skills assessment on EIM of TVL students in terms of methods of assessment process among the respondents.

It shows that “It presents a model of training in technology of electrical installation and maintenance”, with a weighted mean of 4.21 or Strongly Agree which means methods of assessment in the school are properly modelled on technology of training based on the needs of the respondents. It also shows that “It provides a model of method assessment on the task, purpose, and normative based on electrical installation for students”, with a weighted mean of 3.27 or Moderately Agree which means assessment method and process is normative in nature with purpose of the task to be globally competent in the TVL of students as far as EIM is concerned. The overall average weighted mean is 3.88 (SD=0.412) or Agree on the basic core competency of knowledge and skills assessment on EIM of TVL students in terms of methods of assessment process among the respondents.

Findings show that methods of assessment on electrical installation and maintenance is determined on the operational amplitude of the current supply of voltage and system. It discusses the method of measurement and operation of practice implementation of electrical installation and maintenance power and equipment. It analyzes the process and signals-based utilization method of assessment. It determines the parabolic and coefficients of the digital filter approximation process. It describes the methods of assessment utilization and components. The method of assessment proposes the connection of usage in electrical installation and signals. It utilizes the methods of

assessment and consideration on powerful detection of electrical installation and situation (Lange, *et al.*, 2021) ^[45].

Table 7: Basic Core Competency of Knowledge and Skills Assessment on EIM of TVL Student in Terms of Context of Assessment

Indicators	WX	DR
1. It assesses the content that requires accuracy for electrical installation in various techniques and processes of technologies.	4.17	A
2. It requires intensity on multifaceted and electrical installation process and content.	4.22	SA
3. The context of assessment provides methods and aspects on the control of electrical installation and maintenance perspectives.	4.14	A
4. The context and assessment consider the utilization of explicit methods of the process to prevent faulty electrical installation.	3.17	MA
5. It provides a transparent database and updated process for the methods for electrical installation.	3.97	A
6. It supports the development of building the assessment and energy performance algorithm process.	4.10	A
Average Weighted Mean	3.96	A
Standard Deviation	0.395	

Table 7 presents the weighted mean and the corresponding interpretation on the basic core competency of knowledge and skills assessment on EIM of TVL students in terms of context of assessment among the respondents.

It shows in the table that “It requires intensity on multifaceted and electrical installation process and content”, with a weighted mean of 4.22 or Strongly Agree which means content of the assessment focuses on intensity and credibility of electrical installation maintenance for TVL students. It also shows that “The context and assessment considers the utilization of explicit methods of the process to prevent faulty electrical installation”, with a weighted mean of 3.17 or Moderately Agree which means context of assessment has standard procedures to the followed to avoid faulty installation process of electricity especially that students are still on the process of learning. The overall average weighted mean is 3.96 (SD=0.395) or Agree on the basic core competency of knowledge and skills assessment on EIM of TVL student in terms of context of assessment among the respondents.

Findings show that the context of assessment on electrical installation and maintenance as emphasized by provides challenges, scope and opportunities for the assessment of the future goals and innovation of electrical installation process of learning among students. It helps in the increase globalization and industrial process involved in context and assessment. It demands sustainable development in holistic energy to uphold activities and learning of students. It develops energy security related issues for electrical installation. It helps in the process of understanding the electrical installation on sustainable development and connection to resource management (Banik, & Sengupta, 2021) ^[9].

3.3 On the level of knowledge and skills on safety measures and procedures for electrical installation and maintenance of the knowledge and skills assessment among TVL students on the aspect of safety procedures, identity hazards and risks, evaluation of hazards and risk, and control of hazard and risk

Table 8: Level of knowledge and skills Safety Measures and Procedures for EIM of TVL Students on Safety Procedures

Indicators	WX	DR
1. It provides electrical installation on the increased capacity and maintenance of the trends and process of safety procedures.	4.24	SA
2. It designs and review the technicality of infrastructure and building for electrical installation process	4.03	A
3. It requires proper strategy for safety procedures in electrical installation and maintenance for utilization and capability of frequency energy systems.	4.17	A
4. It provides safety procedures because standard steps for electrical installation are reviewed properly for a better installation process to reduce the risks in the process.	4.07	A
5. Electrical installation transforms to comply with the requirements for the safety process that describes the regulation and standard governing the methods of electrical installation.	4.14	A
6. Designs and rules electrical installation for safety procedures, and steps to be strictly followed.	3.17	MA
Average Weighted Mean	3.97	A
Standard Deviation	0.398	

Table 8 presents the weighted mean and the corresponding interpretation on the level of knowledge and skills safety measures and procedures for EIM of TVL students on safety procedures among the respondents.

It shows that “It provides electrical installation on the increased capacity and maintenance of the trends and process of safety procedures”, with a weighted mean of 4.24 or Strongly Agree which means safety procedures on electrical installation and maintenance is being observed and preventive measures for TVL students. It also shows that “Designs and rules electrical installation for safety procedures, and steps to be strictly followed”, with a weighted mean of 3.17 or Moderately Agree which means safety procedures are designed properly for electrical and installation maintenance. The overall average weighted mean is 3.97 (SD=0.398) or Agree on the level of knowledge and skills safety measures and procedures for EIM of TVL students on safety procedures among the respondents.

Findings show that safety and procedures develop safety measures of best practice in electrical installation systems. It directs the process for electrical installation and safety procedures on spot phenomenon and faulty processes. The causes may happen when poor installation is observed and practiced by the installer. It emphasizes and guides the safety procedures in the hazard of installation. It establishes an increased system of specific guidelines and comprehensive system and safe installation. It assesses the safety procedures and practices in the installation

instructions, guidelines and accessibility. It provides a system of safety procedures classified for installation stage and consideration of design. It analyzes the safety practices and procedures for the installation system. It involves a safety checklist for installation guide and suggestions (Ong, et al., 2021) [67].

Table 9: Level of knowledge and skills Safety Measures and Procedures for EIM of TVL Students on Identity Hazards and Risks

Indicators	WX	DR
1. It provides safety measures and immersive parameters for hazard training on electrical context.	4.10	A
2. It defines the situation of hazards and risks in electrical installation and maintenance.	4.14	A
3. It develops safety identification of hazards and risk in the level of electrical installation platforms.	3.79	A
4. It concentrates on an immersive improvement process on the risk and hazard perception recognition.	4.00	A
5. It is a platform and concept development of assessment in hazards and risks identification and sense of perception.	3.24	MA
6. It constructs the TVL subject on hazards and risks as safety of students during electrical installation actual activities.	4.24	SA
Average Weighted Mean	3.92	A
Standard Deviation	0.365	

Table 9 presents the weighted mean and the corresponding interpretation on the level of knowledge and skills safety measures and procedures for EIM of TVL students on identity hazards and risks among the respondents.

It shows that “It constructs the TVL subject on hazards and risks as safety of students during electrical installation actual activities”, with a weighted mean of 4.24 or Strongly Agree which means provides identity on electrical installation and maintenance among students to prevent from exposing from hazards and risk during the learning and actual process of experiences among them. It also shows that “It is a platform and concept development of assessment in hazards and risks identification and sense of perception”, with a weighted mean of 3.24 or Moderately Agree which means concept and platform of identity hazards and risks have been explained to TVL students prior to electrical installation and maintenance among them. The overall average weighted mean is 3.92 (SD=0.365) or Agree on the level of knowledge and skills safety measures and procedures for EIM of TVL students on identity hazards and risks among the respondents.

Findings show that identifying hazards and risks in electrical installation and maintenance recognizes the perception of installers and skills. The hazards and risks guide the safety procedures as the first step and process in electrical installation and maintenance. It provides training and safety on hazard and risk recognition attributed to the tasks associated and desensitized. The objective is to assess the safety risk and hazard recognition of electrical installation skills and perception. It demonstrates the outcome of the gaps and safety program and training (Jazayeri, & Dadi, 2020) [39].

Table 10: Level of knowledge and skills Safety Measures and Procedures for EIM of TVL Students on Evaluation of Hazards and Risk

Indicators	WX	DR
1. It stresses that risks and hazards identification assessment are the key safety factors on evaluation in electrical installation and maintenance.	3.66	A
2. It contains evaluation on the risk analysis of the increased method of safety level in electrical installation and maintenance operation.	3.34	MA
3. It evaluates facilities possible for safety increase and reduction of safety process incidents, and accidents which are the most dangerous in the activities of installation.	3.69	A
4. It provides an overview of the procedures on potential improvement of installation and maintenance in the electricity process	3.79	A
5. It verifies the system of hazards and risks evaluation techniques that applies to some aspects and consideration of hazard process and risk.	3.97	A
6. It determines and analyzes the severity of hazards and risks on the incidents and accidents during electrical installation and maintenance.	3.90	A
Average Weighted Mean	3.72	A
Standard Deviation	0.220	

Table 10 presents the weighted mean and the corresponding interpretation on the level of knowledge and skills safety measures and procedures for EIM of TVL students on evaluation of hazards and risk among the respondents.

It shows that “It verifies the system of hazards and risks evaluation techniques that applies to some aspects and consideration of hazard process and risk”, with a weighted mean of 3.97 or agree which means evaluation of hazards and risks in electrical installation and maintenance is based on the application and techniques for some hazards and risk encountered by TVL students. It also shows that “It contains evaluation on the risk analysis of the increased method of safety level in electrical installation and maintenance operation”, with a weighted mean of 3.34 or Moderately Agree which means that safety and procedures are identified on the evaluation of hazards and risks on electrical installation and maintenance to prevent students from any untoward incidents during the learning process. The overall average weighted mean is 3.73 (SD=0.220) or Agree on the level of knowledge and skills safety measures and procedures for EIM of TVL students on evaluation of hazards and risk among the respondents.

Findings show that evaluation of hazards and risk in electrical installation and maintenance controls the evaluation of the failures and causes of safety instruments and procedures installation of electricity. It controls the system in electrical installation and maintenance as to the analog and advantages. It is more reliable that is proven for the evaluation of hazards and risks of installation components and processes. It integrates framework in hazard analysis, and risk assessment consequences. It provides valuable insights in risk and hazard evaluation for the design and optimization of electrical installation and maintenance (Bao, *et al.*, 2022) ^[11].

Table 11 presents the weighted mean and the corresponding interpretation on the level of knowledge and skills safety measures and procedures for EIM of TVL students on

control of hazard and risk among the respondents.

Table 11: Level of knowledge and skills Safety Measures and Procedures for EIM of TVL Students on Control of Hazard and Risk

Indicators	WX	DR
1. It measures the control of hazards and risks in the decision of risk management as to scientific information development and process.	3.76	A
2. It advances the control of hazards and risks in dealing with TVL students for the installation process of electricity.	3.03	MA
3. It provides limitations to overcome the control of hazards and risks for students during actual activities in electrical installation and maintenance.	4.24	SA
4. It involves assurance on participation and enhancement of control knowledge in hazards and risks that is being observed.	4.10	A
5. It integrates the utilization model for control hazards and risks which is necessary in the transfer knowledge of the installation process.	3.66	A
6. It focuses on practices of specific settings in a driven knowledge of electrical installation and implementation.	4.24	SA
Average Weighted Mean	3.84	A
Standard Deviation	0.465	

It shows that “It provides limitations to overcome the control of hazards and risks for students during actual activities in electrical installation and maintenance”, and “It focuses on practices of specific settings in a driven knowledge of electrical installation and implementation”, with a weighted mean of 4.24 or Strongly Agree which demand control of hazards and risk among TVL students are given emphasis to help them follow the procedures for electrical installation and maintenance among them. It also shows that “It involves assurance on participation and enhancement of control knowledge in hazards and risks that are being observed”, with a weighted mean of 4.10 or agree which means that prior to electrical installation and maintenance students are given proper orientation and knowledge prior to actual process of installation and maintenance process. The overall average weighted mean is 3.84 (SD=0.465) or Agree on the level of knowledge and skills safety measures and procedures for EIM of TVL students on control of hazard and risk among the respondents.

Findings show that control of hazards and risks on electrical installation and maintenance in the workplace and safety risks and hazards in the process of learning provides systematic control on risk hazards and safety in the risks of jobs as to electrical installation and maintenance. The control of hazards and risks applies to the process, techniques, and principles to communicate, create, and deliver the order and values of students' training. It highlights the positive association on control of hazards and risks that establishes the identified process and strategies (Adamopoulos, & Syrou, 2022) ^[11].

3.4 On the significant correlation between the knowledge and skills assessment on electrical installation and maintenance of TVL students and the basic standard core competency

Table 12: Test of Significant Correlation between the Knowledge and Skills Assessment on EIM of TVL students and the Basic Standard Core Competency among the Respondents

Test of Variables	Computed r value	Relationships *significant *not significant	Hypotheses *accepted *rejected
1. Competency Assessment and Certification			
● critical aspect of competency	0.0005093	not significant	accepted
● resource application	0.0005116	not significant	accepted
● methods of assessment	0.0005093	not significant	accepted
● context of assessment	0.0005041	not significant	accepted
2. Registration and Delivery of Training Programs			
● critical aspect of competency	0.0005145	not significant	accepted
● resource application	0.0005168	not significant	accepted
● methods of assessment	0.0005145	not significant	accepted
● context of assessment	0.0005093	not significant	accepted
3. Development of Curriculum and Assessment Instruments			
● critical aspect of competency	0.0005643	not significant	accepted
● resource application	0.0005669	not significant	accepted
● methods of assessment	0.0005643	not significant	accepted
● context of assessment	0.0005586	not significant	accepted
One tailed test, df of 27, with 0.05 level of significant at critical r value of 0.367278			

Table 12 presents the test of significant correlation between the knowledge and skills assessment on electrical installation and maintenance of TVL students and the basic standard core competency among the respondents.

It shows that when the variables are tested on the knowledge and skills assessment and basic core standard competency, it reveals that the computed r value of competency assessment and certification against critical aspect of competency is 0.0005093, resource application is 0.0005116, methods of assessment is 0.0005093, and context of assessment is 0.0005041 which is not significant and acceptance of the hypothesis.

On the other hand, when variables are tested on registration and delivery of training programs against critical aspect of competency, the computed r value is 0.0005145, resource application is 0.0005168, methods of assessment is 0.0005145, and context of assessment 0.0005093 which is not significant and acceptance of the hypothesis.

Similarly, when variables are tested on development of curriculum and assessment instruments against critical aspect of competency, the computed r value is 0.0005643, resource application is 0.0005669, methods of assessment

are 0.0005643, and context of assessment is 0.0005586 which resulted to non-significance and acceptance of the hypothesis.

It shows that all computed r values for every variable are lower than the critical r value of 0.367278, one tailed test, df of 27 and with 0.05 level of significance which resulted in non-significance. Hence, it shows that there is no significant correlation between the knowledge and skills assessment on electrical installation and maintenance of TVL students and the basic standard core competency among the respondents. This supports the study of (Malonda, 2022)^[51] that identifies the design and logic for evaluation of electrical installation being transmitted for the teachers' knowledge through skills-based process and approach. It highlights the techniques, direct observation for the content analysis and process of assessment competency. It is designed for the learning process in utilization and integration of the lesson.

3.5 On the significant correlation between the knowledge and skills on electrical installation and maintenance of TVL students and their level of knowledge and skills on the safety measures and procedures

Table 13: Test of Significant Correlation between the Knowledge and Skills on EIM of TVL Students and their Level of Knowledge and Skills on the Safety Measures and Procedures

Test of Variables	Computed r value	Relationships *significant *not significant	Hypotheses *accepted *rejected
1. Competency Assessment and Certification			
● safety procedures	0.0005034	not significant	accepted
● identity hazards and risks	0.0005067	not significant	accepted
● evaluation of hazards and risk	0.0005198	not significant	accepted
● control of hazard and risk	0.0005120	not significant	accepted
2. Registration and Delivery of Training Programs			
● safety procedures	0.0005058	not significant	accepted
● identity hazards and risks	0.0005119	not significant	accepted
● evaluation of hazards and risk	0.0005252	not significant	accepted
● control of hazard and risk	0.0005172	not significant	accepted
3. Development of Curriculum and Assessment Instruments			
● safety procedures	0.0005578	not significant	accepted
● identity hazards and risks	0.0005614	not significant	accepted
● evaluation of hazards and risk	0.0005760	not significant	accepted
● control of hazard and risk	0.0005172	not significant	accepted
One tailed test, df of 27, with 0.05 level of significant at critical r value of 0.367278			

Table 13 presents the test of significant correlation between the knowledge and skills on electrical installation and maintenance of TVL students and their level of knowledge and skills on the safety measures and procedures among the respondents.

It reveals that when the two variables are tested on competency assessment and certification against safety procedures, the compute r value is 0.0005034, identity hazards and risks is 0.0005067, evaluation of hazards and risk is 0.0005198, and control of hazard and risk is 0.0005120 which is not significant and resulted to acceptance of the hypothesis.

Furthermore, when two variables are tested on development of curriculum and assessment instruments against safety procedures, the computed r value is 0.0005578, identity hazards and risks is 0.0005614, evaluation of hazards and risk is 0.0005760, and control of hazard and risk 0.0005172 which is also not significant and acceptance of hypothesis.

In addition, when the two variables are tested on registration and delivery of training programs against safety procedures, the computed r value reveals 0.0005058, identity hazards and risks reveal 0.0005119, evaluation of hazards and risk reveals 0.0005252, control of hazard and risk reveals 0.0005172 which is not significant and the hypothesis is accepted.

It shows that all computed r values for every variable are lower than the critical r value of 0.367278, one tailed test, df of 27 and with 0.05 level of significance which resulted in non-significance. Therefore, it is safe to say that there is no significant correlation between the knowledge and skills on electrical installation and maintenance of TVL students and their level of knowledge and skills on the safety measures and procedures as observed among the respondents. The findings prove that that safety and procedures directs the process for electrical installation and safety procedures on spot phenomenon and faulty processes. It involves a safety checklist for installation guide and suggestions (Ong, *et al.*, 2021)^[67].

3.6 On the significant correlation between the basic standard core competency of knowledge and skills on electrical installation and maintenance and their level of knowledge and skills on safety measures and procedures

Table 14 presents the test of significant correlation between the basic standard core competency of knowledge and skills

on electrical installation and maintenance and their level of knowledge and skills on safety measures and procedures as observed among the respondents.

It reveals that when the variables are tested on critical aspect of competency against safety procedures, the computed r value is 0.0005089, identity hazards and risks is 0.0005123, evaluation of hazards and risk is 0.0005255, and control of hazard and risk is 0.0005176 which not significant and acceptance of the hypothesis.

Similarly, when the variables are tested on resource application against safety procedures, the computed r values is 0.0005112, identity hazards and risks is 0.0005146, evaluation of hazards and risk is 0.0005279, and control of hazard and risk is 0.0005199 which resulted to not significance of the relationship and acceptance of the hypothesis. This supports the level of knowledge and skills on safety measures and procedures for electrical installation and maintenance knowledge and skills assessment among TVL students on the aspect of safety procedures, identity hazards and risks, evaluation of hazards and risks, and control of hazards and risks provide an effect on student achievement academics on electrical installation and maintenance work among them (Nonso, & Onyebuonyi Promise, 2022)^[60].

Indeed, when the variables are tested on methods of assessment against safety procedures, the computed r values is 0.0005089, identity hazards and risks is 0.0005123, evaluation of hazards and risk is 0.0005255, and control of hazard and risk is 0.0005176 which the relationship is not significant and the hypothesis is accepted.

Notably, when the variables are tested on contexts of assessment against safety procedures is, the computed r is 0.0005037, identity hazards and risks is 0.0005070, evaluation of hazards and risk is 0.0005202, and control of hazard and risk is 0.0005123 which is resulted to non-significance and the hypothesis is accepted.

It reveals that all computed r values for every variable are lower than the critical r value of 0.367278, one tailed test, df of 27 and with 0.05 level of significance which resulted in non-significance. Therefore, it is safe to say that there is no significant correlation between the basic standard core competency of knowledge and skills on electrical installation and maintenance and their level of knowledge and skills on safety measures and procedures as observed among the respondents.

Table 14: Test of Significant Correlation between the Basic Standard Core Competency of Knowledge and Skills on EIM and their Level of Knowledge and Skills on Safety Measures and Procedures

Test of Variables	Computed r value	Relationships *significant *not significant	Hypotheses *accepted *rejected
1. Critical Aspect of Competency			
● safety procedures	0.0005089	not significant	accepted
● identity hazards and risks	0.0005123	not significant	accepted
● evaluation of hazards and risk	0.0005255	not significant	accepted
● control of hazard and risk	0.0005176	not significant	accepted
2. Resource Application			
● safety procedures	0.0005112	not significant	accepted
● identity hazards and risks	0.0005146	not significant	accepted
● evaluation of hazards and risk	0.0005279	not significant	accepted
● control of hazard and risk	0.0005199	not significant	accepted
3. Methods of Assessment			
● safety procedures	0.0005089	not significant	accepted
● identity hazards and risks	0.0005123	not significant	accepted
● evaluation of hazards and risk	0.0005255	not significant	accepted

● control of hazard and risk	0.0005176	not significant	accepted
4. Contexts of Assessment			
● safety procedures	0.0005037	not significant	accepted
● identity hazards and risks	0.0005070	not significant	accepted
● evaluation of hazards and risk	0.0005202	not significant	accepted
● control of hazard and risk	0.0005123	not significant	accepted

One tailed test, df of 27, with 0.05 level of significant at critical r value of 0.367278

This supports the knowledge and skills assessment on electrical installation and maintenance of TVL students in the area of competency assessment and certification, registration and delivery of training programs, and development of curriculum and assessment instruments provide an approach among the learners to gain necessary skills, knowledge, and attitude for the trade area and success. It indicates instructional design and poor implementation process will expose to low electrical installation and quality in the system (Miseda, & Kitainge, 2021) [55].

4. Conclusions and Recommendations

It shows that knowledge and skills assessment on electrical installation and maintenance of TVL students in the area of competency assessment and certification evaluates the success of the program in electrical installation and maintenance, registration and delivery of training programs involves and confirms teachers for proper registration and training programs in electrical installation and maintenance, development of curriculum and assessment instruments determines the course type of development assessment instruments and implementation of the work practice among students. Hence, success of the programs has confirmed by the TVL teachers since the result of the output has a good impact in the learning process of students as to its application.

Notable, it shows that basic core competency of knowledge and skills assessment on EIM of TVL in terms of critical aspect of competency develops technology in the critical aspect of competency in the field of electrical installation as a challenge for students and skills, resource application utilizes the system, methods of assessment process presents a model of training in technology of electrical installation and maintenance, context of assessment requires intensity on multifaceted and electrical installation process and content, and safety procedures provides electrical installation on the increased capacity and maintenance of the trends and process of safety procedures.

Similarly, the level of knowledge and skills safety measures and procedures for EIM of TVL students on identity hazards and risks constructs the TVL subject on hazards and risks as safety of students during electrical installation actual activities, evaluation of hazards and risk verifies the system of hazards and risks evaluation techniques that applies to some aspects and consideration of hazard process and risk, and control of hazard and risk provides limitations to overcome the control of hazards and risks for students during actual activities in electrical installation and maintenance where it focuses on practices of specific settings in a driven knowledge of electrical installation and implementation.

In addition, it shows that there is no significant correlation between the knowledge and skills assessment on electrical installation and maintenance of TVL students and the basic standard core competency among the respondents, shows

that there is no significant correlation between the knowledge and skills on electrical installation and maintenance of TVL students and their level of knowledge and skills on the safety measures and procedures as observed among the respondents, and shows that there is no significant correlation between the basic standard core competency of knowledge and skills on electrical installation and maintenance and their level of knowledge and skills on safety measures and procedures as observed among the respondents.

On the other hand, there is a need for the knowledge and skills assessment on electrical installation and maintenance to prepare job openings and answer unemployment workforce as part of the assessment and certification competency as part evaluation of TVL students for the success of electrical installation and maintenance. Moreover, there is a need for registration and delivery of training programs to ensure proper development suitable in teaching aid which involves and confirms teachers for proper registration and training programs in electrical installation and maintenance. Also, there is a need for development of curriculum and assessment instruments to provide electrical installation illumination on assessment instrument portfolio to include industrial work practice on competency as part of activities and implementation in the lesson.

Furthermore, there is a need for the basic core competency of knowledge and skills assessment on EIM of TVL in terms of critical aspect to determine technical knowledge on electrical installation as critical aspect competency of students as part of evaluation and measures. Yet, there is a need for resource application to concentrate on application of electrical installation and maintenance especially on utilization of collection and technology of resources. Also, there is a need for methods of assessment process to provide a model of method assessment on the task, purpose, and normative based on electrical installation for students as part of training among electrical installation and maintenance of TVL. Notably, there is a need for context of assessment to consider the utilization of explicit methods of the process to prevent faulty electrical installation among students especially that they are in the process of learning. Indeed, there is a need for safety procedures designs and rules electrical installation for safety procedures, and steps to be strictly followed.

Similarly, there is a need for the level of knowledge and skills safety measures and procedures for EIM of TVL students on identity hazards and risks to provide platform and concept development of assessment in hazards and risks identification and sense of perception. Hence, there is a need for evaluation of hazards and risk to evaluate and analyze the increased method of safety level in electrical installation and maintenance operation. In contrast, there is a need for control of hazard and risk to involve assurance on participation and enhancement of control knowledge in hazards and risks that is being observed among TVL

students.

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