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## ASSESSMENT OF TOOLS AND EQUIPMENT IN TEACHING SENIOR HIGH SCHOOL TECHNICAL VOCATIONAL AND LIVELIHOOD TRACK

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### ABSTRACT

*This study aimed to find out the Level of availability of equipment and tools for the effective teaching and learning of Industrial Arts-TVL Electrical Installation and Maintenance NC II and Shielded Metal Arc Welding NC II of Senior High School in Medina National Comprehensive High School. Three senior high school TVL laboratory teachers were ask to fill in the tools and equipment checklist given by the researchers. Results revealed that the tools such as Pipe cutter, Pipe reamer, Pipe threader, Pipe bender, Bolt cutter, Ball hammer, Wire splicer, Push-pull 0-5 m, Heat gun 1200 watts, Electric drill, Multi-tester, CCTV (4 cameras, 1 DVR), Fire alarm system (5units detector, 1 control panel) were 100% available in the Electrical Installation and Maintenance Laboratory. Other tools such as Wire stripper, Spirit level, Hack saw (60%), Screwdrivers set (68.%), Electrician Pliers (56%), Clamp-on meter, Portable grinder (40%), Motion sensors (33.33%) and Ball hammer, Electrician knife, Claw hammer, Heavy-duty soldering iron (20%). The rest of the tools and equipment needed for Industrial Arts-TVL Electrical Installation and Maintenance NC II instruction were not available. On the other hand, the tools lens clear glass, metal chalk, filter lens, head shield, safety goggles, Arc Welding machine AC/DC and accessories, Electrode oven, Portable Disc Grinder, Exhaust Fan, Anvil Oxy-acetylene/Oxy-LPG cylinder with content & Electrode 3.2mm E7018/6013 were 100% available. Furthermore, there were tools and equipment given by DepEd central office which can be found in the laboratory room but are not necessary for EIM and SMAW NC II. These tools include combination wrench, wheel borrow, portable electric grinder, percussion drill and jack hammer. As a conclusion, the tools and equipment in MNCHS SHS TVL laboratory room are still inadequate. In addition, there were tools and equipment that are present but not necessary for the EIM and SMAW NC II.*

**KEYWORDS:** *Assessment, Academic Track, Technical Vocational Track, Tools and Equipment*

## 1. INTRODUCTION

Two of the Tech-Voc specialized course offered in the Senior high school of Medina National comprehensive High School are electrical Installation and Maintenance NC II and shielded Metal Arc Welding NC II under the Industrial Art-Tech-voc track. This course was designed for the purpose of preparing the students to become competitive electrician and welder. It was experience by the industrial Art-TechVoc teachers/trainer including author that less tools and equipment were available in school for teaching and for practical activities on the part of the students.

Tools and equipment are vital for teaching and learning process for practical courses. According to Adeogun (1999), tools and equipment for teaching are the educational resources that are available in schools that can be used to achieve educational goals and objective. These include workshops, equipment and tools. These tools and equipment influence the academic performance of students and prepare them for useful living (Uwameiye, 2016)

Study revealed that the lack of tools and have a negative effect to the students learning and performance Ugbo, 2014. In addition, Akhihiro (2011) concluded that students who are made to learn

under poor provisions of infrastructural facilities become half-baked.

Hence, the researchers decided to look at the availability of the materials in the TVL-EIM NCII and SMAW NCII laboratory of medina National Comprehensive High School (Senior High School Department). In addition, the availability of the tools and equipment were compared to the basic number of tools and equipment in Training Regulations of Technical education and Skills Development Authority Electrical Installation and Maintenance and Shielded Metal Arc Welding National Certificate II.

## 2. OBJECTIVE

This study aimed to find out the Level of availability of equipment and tools for the effective teaching and learning of Industrial Arts-TVL Electrical Installation and Maintenance NC II and Shielded Metal Arc Welding NC II of Senior High School in Medina National Comprehensive High School.

## 3. METHODOLOGY

The school head was informed through formal letter about the floating of the checklist to the participants. The participants were asked to write the quantity of tools and equipment based on the TESDA EIM NCII and SMAW NC II basic materials. The next pages were the pictures during the examination of tools and equipment:



**Figure 1. Sample Images During the Assessment of Tools and Equipment**

The checklists were retrieved after two days and were analyzed thereafter. This study made use of descriptive statistics to analyze the results. A table was used to represent the results for availability of the various laboratory tools and equipment. In addition, to get a clearer view of the availability and unavailability of the tools and equipment, percentage were utilized.

## 4. SAMPLING DESIGN

The Industrial Arts-TVL teachers and most importantly laboratory in-charge were given checklist to determine the availability of the various tools and equipment in the Industrial Arts-TVL SMAW and EIM

Laboratory/shop. The Industrial Arts-TVL shop was the venue of the practical activities of the senior high school students.

## 5. STATISTICAL DESIGN

This study made use of descriptive statistics to analyze the gathered data. Frequency and percentage were used to present the number of tools and equipment for both EIM and SMAW laboratory rooms.

## 6. GEOGRAPHICAL AREA

The research locale is a comprehensive high school of the Division of Misamis Oriental, Region X,

Philippines and belongs to a 3<sup>rd</sup> class municipality. The school belongs to rural area and is situated at the Eastern part of Misamis Oriental. The municipality where the data are gathered is in Medina, Misamis

Oriental. Below is the location of Medina National Comprehensive High School where the data were gathered:

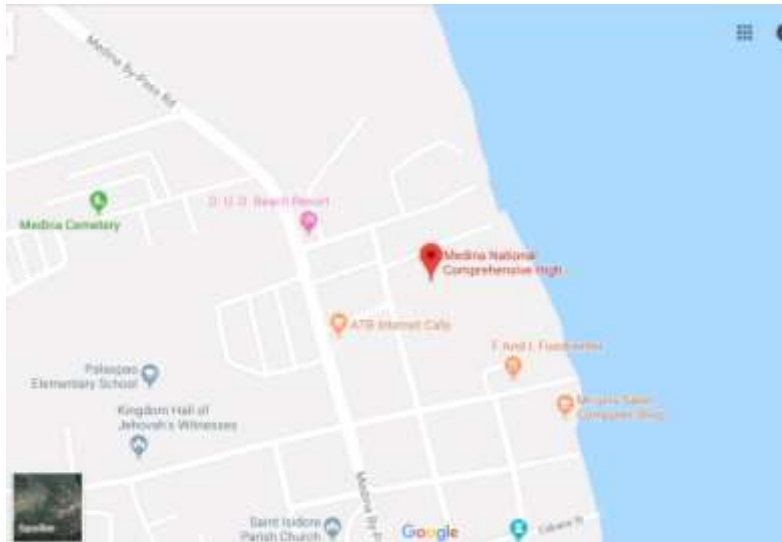


Figure 1. The Geographical Location of MNCHS

7. RESULTS

Table 1. Availability and Recommended quantity of tools and Equipment per 25 trainees for EIM NC II.

Tools Equipment	Recommended Quantity of Tools and Equipment per 25 trainees	Available	Not available	% available	% not available
Spirit level	5 pcs.	3	2	60%	40%
Hack saw	5 pcs.	3	2	60%	40%
Pipe cutter	5 pcs.	5	0	100%	
Pipe reamer	5 pcs.	5	0	100%	
Pipe threader	5 pcs.	5	0	100%	
Pipe bender	5 pcs.	5	0	100%	
Bolt cutter	5 pcs.	5	0	100%	
Ball hammer	5 pcs.	1	4	20%	80%
Electrician Pliers	25 pcs.	14	11	56%	44%
Screwdrivers set	25 pcs.	17	8	68%	32%
Box Wrench	5 pcs.	0	-	-	-
Wire splicer	5 pcs.	5	0	100%	
Wire stripper	5 pcs.	3	2	60%	40%
Electrician knife	5 pcs.	1	4	20%	80%
Tools holster	10 pcs.	0	-	-	-
Push-pull 0-5 mtrs	5 pcs.	5	0	100%	
Claw hammer	5 pcs.	1	4	20%	80%
Prick punch	5 pcs.	0	-	-	-
Heat gun 1200 watts	5 pcs.	5	0	100%	
Heavy-duty soldering iron	5 pcs.	1	4	20%	80%
Flat file smooth 8"	5 pcs.	0	-	-	-
#16 G.I wire	5 Kgs.	0	-	-	-

Whiteboard 4 x 8 x ¾	1 pc.	0	-	-	-
Whiteboard 4 x 4 x ¾ with movable 0stand	1 pc.	0	-	-	-
Whiteboard marker, assorted color	1 box	0	-	-	-
Push pin	1 box	0	-	-	-
Pencil sharpener	1 pc.	0	-	-	-
Pencil with eraser	25 pcs.	0	-	-	-
Rags	2 kgs	0	-	-	-
Cleaning agent liquid	5 ltrs	0	-	-	-
First aid kit	1 unit	0	-	-	-
Bond paper	2 reams	2	0		
Whiteboard eraser magnetic	5 pcs	0	-	-	-
Electric drill	5 units	5	0	100%	
Portable grinder	5 units	2	3	40%	60%
Multi-tester	5 units	5	0	100%	
Fire alarm system (5units detector, 1 control panel)	1 set	1	0	100%	
Motion sensors	3 sets	1	2	33.33%	67%
Security equipment Access Control	1 set	0	-	-	-
CCTV (4 cameras, 1 DVR)	1 set	1	0	100%	
Clamp-on meter	5 units	2	3	40%	60%
Insulation Resistance Tester	1 unit	0	-	-	-
Earth resistance tester	1 unit	0	-	-	-
Labeling machine	1 unit	0	-	-	-
Fire extinguisher KGS ABC	1 unit	0	-	-	-
LCD Projector	1 unit	0	-	-	-
Laptop	1 unit	0	-	-	-

Based on table 1, the tools such as Pipe cutter, Pipe reamer, Pipe threader, Pipe bender, Bolt cutter, Ball hammer, Wire splicer, Push-pull 0-5 mtrs, Heat gun 1200 watts, Electric drill, Multi-tester, CCTV (4 cameras, 1 DVR), Fire alarm system (5units detector, 1 control panel) were 100% available in the Electrical Installation and Maintenance Laboratory. Other tools such as Wire stripper, Spirit level, Hack saw (60%), Screwdrivers set (68.%), Electrician Pliers (56%), Clamp-on meter, Portable grinder (40%), Motion sensors (33.33%) and Ball hammer, Electrician knife, Claw hammer, Heavy-duty soldering iron (20%). The rest of the tools and equipment needed for Industrial

Arts-TVL Electrical Installation and Maintenance NC II instruction were not available. Though there were tools and equipment that are 100% available, the school must not be satisfied or feel happy about it because the number of availability is good only for 25 trainees while during the conduct of classes for Industrial Arts Track an average of 50 students per class are doing laboratory work. These results supported the findings of Gregorio in Catanduanes that other TVL courses including Industrial Arts, the available tools and equipment does not conform to the standards in terms of quantity.

**Table 2. Availability and Recommended quantity of tools and Equipment per 25 trainees for SMAW NC II.**

Tools Equipment	Recommended Quantity of Tools and Equipment per 25 trainees	Available	Not available	% available	% not available
Chipping Hammer	12pcs	5	7	41.67	58.33
Steel Brush	12pcs	7	5	58.33	41.67
Ballpeen Hammer	8pcs	4	4	50	50
Plier/tong	12pcs	-	-	-	-
Files-bastard cut	10 pcs	-	-	-	-
Head Shield/helmet	12pcs	12	0	100	0
Leather Jacket/ Apron	12sets	2	10	16.66	83.33
Leather Gloves	12sets	-	-	-	-
Safety google, wide vision	2pcs	2	0	100	0
Oxy-acetylene Goggles	2pcs	-	-	-	-
Arc Welding machine AC/DC and accessories	8units	8	0	100	0
Welding table/positioners	8 pcs	-	-	-	-
Electrode oven	1unit	1	0	100	0
Automatic gas cutting machine	1unit	-	-	-	-
Portable Disc Grinder	5units	5	0	100	0
Exhaust Fan	1units	1	0	100	0
Power Hacksaw	1units	-	-	-	-
Anvil	2units	2	0	100	0
Work bench w/ bench vice on 4 corners	2units	-	-	-	-
Oxy-acetylene/Oxy-LPG cylinder with content	2 sets	1	0	100	-
Electrode 3.2mm E6011	6boxes	-	-	-	-
Electrode 3.2mm E7018/6013	6boxes	6	0	100	-
Mild steel plate 10mm X 150mm X 6m	20pcs	5	15	25	75
Mild steel plate 3.2mm X 150mm X 6m	20pcs	-	-	-	-
Carbon steel pipe, schedule 40 dia. 150 X 3m	8 pcs	-	-	-	-
Filter lens	20pcs	20	-	100	-
Lens Clear Glass	20pcs	20	-	100	-
Cut off disc 6mm X 15mm X 100mm	20pcs	20	-	100	-
Power saw blade	5pcs	-	-	-	-
Metal chalk	1Box	1	-	100	-

Based on table 2, the tools lens clear glass, metal chalk, filter lens, head shield, safety goggles, Arc Welding machine AC/DC and accessories, Electrode

oven, Portable Disc Grinder, Exhaust Fan, Anvil Oxy-acetylene/Oxy-LPG cylinder with content & Electrode 3.2mm E7018/6013 were 100% available. However,

the number of students per class exceeds 25 hence some of the students might not be able to achieve the competencies required for them.

Materials and equipment that are not available were Plier/tong, Files-bastard cut, Oxy-acetylene Goggles, Welding table/positioners, Automatic gas

cutting machine, Power Hacksaw, Work bench w/ bench vice on 4 corners, Electrode 3.2mm E6011, Mild steel plate 3.2mm X 150mm X 6m, Carbon steel pipe, schedule 40 diameter. 150 X 3m, Power saw blade. The absence of this tools and equipment might affect the learning of the students

**Table 3. Tool and Equipment Available but not Required by the TESDA**

Tools and Equipment	
EIM	SMAW
Combination wrench	Combination wrench
Portable electric grinder	Wheel borrow
Percussion drill	
Jack hammer	

Table 3 revealed that there were tools and equipment given by DepEd central office which can be found in the laboratory room but are not necessary for EIM and SMAW NC II. These tools include combination wrench, wheel borrow, portable electric grinder, percussion drill and jack hammer.

**8. SUGGESTIONS**

- 8.1. Update the various tools and equipment of the Industrial Arts Laboratory room for instructional purposes.
- 8.2. The administration must find ways to purchase or acquire new tools and equipment in the future.
- 8.3. For the meantime, the students and the teachers must bring tools and equipment available in their houses to be used in Industrial Arts-TVL laboratory.
- 8.4 Conduct a periodic inventory of tools and equipment.
- 8.5. The department of education must look consider reviewing the training regulations of TESDA to avoid purchasing of unnecessary tools and equipment.

**9. CONCLUSION**

As a conclusion, the tools and equipment in MNCHS SHS TVL laboratory room are still inadequate. In addition, there were tools and equipment that are present but not necessary for the EIM and SMAW NC II.

**10. REFERENCES**

1. Adeogun, A.A. (2001). *The principal and the financial management of public secondary schools in Osun State. Journal of Educational System and Development.* 5(1),

pp.1 - 10. Retrieved from: <http://www.sciepub.com/reference/47791>

2. Akhiero, E.T. (2011). *EFFECT OF INADEQUATE INFRASTRUCTURAL FACILITIES ON ACADEMIC PERFORMANCE OF STUDENTS OF OREDO LOCAL GOVERNMENT AREA OF EDO STATE. The Nigerian Academic Forum Volume 20 No. 1. Retrieved from: http://www.globalacademicgroup.com/journals/the%20nigerian%20academic%20forum/EFFECT%20OF%20INADEQUATE.pdf*

3. *Technical Education and Skills Development Authority (2014). Training Regulations EIM NCII, SMAW NCII.*

4. Mwiria, K. (1985). *“The Harambee School Movement: A historical perspective”.* Unpublished Ph.D. Thesis, University of Wisconsin.

5. Ogbu, J.E. (2015). *Influences of Inadequate Instructional Materials and Facilities in Teaching and Learning of Electrical/Electronics Technology Education Courses. Journal of Education and Practice. Vol.6, No.33, 2015. Retrieved from: https://files.eric.ed.gov/fulltext/EJ1083540.pdf*

6. Uwameiye, B.E. (2016). *Availability and Utilization of Tools and Equipment for Teaching and Learning Garment Making Trade in the Senior Secondary Schools in Edo State. International Journal of Humanities Social Sciences and Education (IJHSSE) Volume 3, Issue 3, March 2016, PP 12-18. Retrieved from: https://www.arcjournals.org/pdfs/ijhsse/v3-i3/2.pdf*