

Multifunctional Transformable Table: A Pedagogical Tool in Industrial Arts

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Abstract – This study aimed to develop and evaluate a Multifunctional Transformable Instructional Table for BTLED – Industrial Arts students of the Department of Technology Teacher Education, College of Education, MSU-Iligan Institute of Technology, A. Bonifacio Ave. Tibanga, Iligan City.

This developed table was evaluated by fifty (50) respondents composed of forty (40) students and ten (10) teachers via online evaluation. Then, the designed table was assessed based on the following criteria: usability, portability, aesthetics, and safety. The results were analyzed by the use of descriptive statistics such as weighted mean and standard deviation. A five-point scale was used to indicate the respondents' evaluation.

The innovation introduced in this study is the transformable characteristic of a table that can be used not only as a table but one which could be transformed into an instructional board. As a table, it can be used as a teacher's table as well as a demonstration table and as an instructional board it can be used as a whiteboard or a projector screen for multimedia presentations. Moreover, this instructional board can be used as a holder for trainer sets in electrical wiring installation and full-wave rectifier wiring.

Results of the evaluation of this transformable table shows that both teachers and students gave a rating of excellent in terms of its usability, portability, aesthetics, and safety, which was described as highly acceptable. It implies that this transformable table can be utilized as an instructional tool or equipment that will aid teachers and students in the teaching and learning process in Industrial Arts. Moreover, this can be of great help to teachers in making instruction more engaging for students as it simulates real scenarios even those that are outside the classroom scenarios.

Keywords– Multifunctional table, Transformable Table, Instructional board, Instructional tool, Industrial Arts.

I. INTRODUCTION

In school, the classroom or laboratory shops are where the teaching and learning process usually happens. To provide effective delivery of education as well as to respond to the changing programs in school, the educational facility must be conducive for learning. It should be that one provides an environment that is comfortable, safe, secure, accessible, well-illuminated, well-ventilated, and aesthetically pleasing [1]. But most of the schools in our country today have the same problem on lack of classrooms. In addition, also lack of teaching materials, instruments, or equipment is also observed.

Being enrolled in a public school does not mean that the students may not be provided with a well-maintained school facility. Lack of classrooms, tables, and chairs is an example of this. Students in public schools also experience poor ventilation, sparse comfort rooms and

canteens, outdated books, and other teaching sources are the ones usually given to students [1].

The Mindanao State University – Iligan Institute of Technology (MSU-IIT) offers a program on Bachelor of Technology Livelihood Education (BTLE), a revised Bachelor of Science in Technology Teacher Education (BSTTE) curriculum with options to include Industrial Arts. The BTLED-IA program is designed to produce teachers who will be teaching exploratory subjects from Grade IV to Grade VIII of the K-12 curriculum of the Department of Education (DepEd).

It was identified that the academic institutions, including TEIs, faced challenges with the implementation of the K-12 program, on how to align and reconstruct courses offered that accommodate the needs of DepEd. Some of these challenges include the need of prospective teachers who will be teaching technology areas who have National Certification level 2 (NC 2) in a specific area for them to be employed by DepEd. In addition, it is noted that the K-12 curriculum focuses on developing the 21st-century

skills of the students, including expertise in collaboration, critical thinking, and technology literacy, etc. [7]. Presently, the Department of Technology Teacher Education at the College of Education in MSU-IIT, instructors or teachers handling major subjects for BTLED-IA have limited materials such as trainer sets or mockups as learning materials during classes or instruction. Most of them rely on multimedia presentations, videos, and illustrations for students to have firsthand knowledge of what to do and how things work before they are exposed to hands-on activities. Similarly, it was found out that there is an inadequacy in the number of instructional resources as well as the amount of the tools and equipment that concerns to the number of students enrolled in Bachelor of Science in Education major in Technology and Livelihood Education (BSED-TLE) subjects; in which it is one of the courses offered in the Department of Technology Teacher Education [2]. For teachers to have a practical approach in teaching major subjects the use of additional innovative instructional materials or equipment is viewed to be of great help in achieving the goals in the program. As recommended, teachers or trainers are encouraged to innovate teaching aids for electrical installation and maintenance, which would help them to be more effective and efficient in the teaching-learning process [8]. Also, it was recommended that instructors or teachers should have the initiative in procuring instructional materials and tools which laboratories of the department lack [2].

Innovating teaching devices has been practiced especially when educational funding becomes scarce and when globalization of multifaceted equipment is very far to attain. In a teaching-learning process that occurs in the classroom, the teacher has always been a prominent Fig.; but students are at the most critical focus in the process. In the development and improvisation of the learning process, many innovations in the advancement of teaching devices have been tried and tested in various fields [4]. Therefore, there is a necessity of technology innovation to cater the lack of training facilities and instruments and to attain the objectives in delivering the needed skills, technical discipline, and use of devices for training [9]. People remember about 80% of what they see and only 10% of what they hear. Using chalkboards, teachers directly present visible cues through writing to the board and let them write to display their understanding. Research has determined that through visual presentation, the student's productivity in comprehending and understanding improves [3]. By exposing students to different hands-on activities and exercises enables students to comprehend and understand the learning procedures in performing electrical installation and maintenance [8]. In teaching and learning, EIMW is enhanced when instructional materials aid concept and ideas in teaching the subject. These instructional materials can make instruction more engaging to students as it simulates reality from the world outside to the four

corners of the classroom and teaches the concepts to student's memory much longer [6].

As classrooms are the most predominant learning space in school, the use of flexible instructional material through its type, location, and the adjustment enables learning through teacher-directed instruction, individual or small- or large-group study and work, presentations, one-on-one instruction and discussion for school equipment in general certainly apply to the classroom [5].

Generally, multipurpose tables are commonly used in picnics or camping, which can be folded to save space in placing it on the vehicle (truck, car, or jeep) or storing inside the house. Some can be transformed into a chair, bench, bed, and can be transformed with a combination of table and chair or bench. One of the common uses of such a device is to save space in a small area and to cut cost effectively. Developing a multifunctional transformable table to be used for instructional purposes in the class or laboratory activities is potential to help in solving problems of lack of school facilities such as equipment and instructional materials. It is in this relation that the creation of a multifunctional transformable table could be one of those functional instructional materials. This instructional board could be used as a whiteboard and projector screen, and at the same time, a trainer set for electrical installation, drawing board, and basic electronics trainer sets.

II. METHODS

Research Design

This study utilized the use of the developmental and descriptive method of research. Developmental method as it aimed to develop a multifunctional transformable instructional table which was then evaluated by the respondents basing a set of criteria following a descriptive method.

Research Setting

The study was conducted at the Department of Technology Teacher Education, College of Education, MSU-IIT, Tibanga Iligan City, Lanao del Norte, Philippines.

Respondents of the Study and Sampling Procedure

This study used purposive sampling in selecting the respondents who evaluated the Multifunctional Transformable Table. The respondents of the study were ten (10) teachers/TESDA trainers who are teaching electrical installation-related subjects and forty (40) students from BSTTE – IT and BTLED – IA students of the Department of Technology Teacher Education (DTTE), College of Education, MSU-IIT.

Data Collection Procedure

The developed Multifunctional Transformable Table was presented in the laboratory shop of the DTTE, College of Education, MSU-IIT. A video of the Multifunctional Transformable Table was sent online to the respondents via Facebook Messenger. Then these respondents were given an evaluation rubric/questionnaire online via Facebook Messenger and Google forms. After the respondents were able to answer the evaluation rubric/questionnaire via Google forms, the researcher collected them and gathered all the evaluation rubric/questionnaire of the fifty (50) respondents. After collating the data, these were tabulated and interpreted via statistical analysis and interpretation.

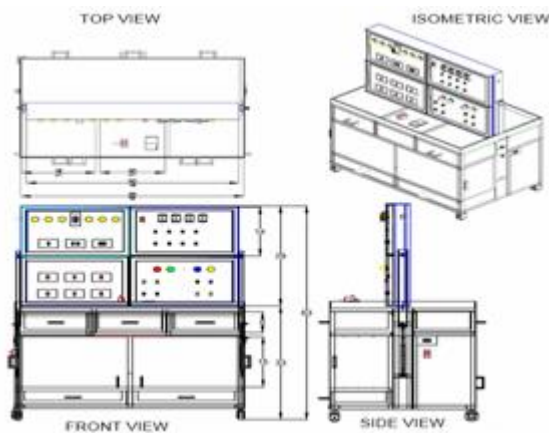


Fig. 1. Multifunctional Transformable Table Design.

Fig. 1 shows the design and measurements of the Multifunctional Transformable Table using an AutoCAD. The drawing is drawn not to scale. The top view of the design shows the length of the tabletop, which is 48". It can also be seen the measurements of the front drawer's length that is in 15" for both side drawers and 16" for the trainer's power circuit. The front view shows the height of the table from the base of the caster wheel to the tabletop which is 33", instructional board's height which is 29" and the height of the front drawers which is 6" and overall height when the instructional board is extended which is 63". The isometric view of the Multifunctional Transformable Table is also shown in the Fig..

Research Instrument

The instrument used in gathering the data is the evaluation rubric for the developed Multifunctional Transformable Table. The criteria for the evaluation of the developed table were based on the study entitled "Refrigeration and Air Conditioning Instructional Trainer"[10]

Statistical Tool

The data that were gathered and organized in matrix form before they were subjected to statistical treatment. The following statistical tools were used in this study: The Mean was computed in determining the evaluation result on the product by the respondents.

The Standard Deviation determines the similarity of the scores that were obtained during the evaluation.

In the evaluation system, a 5 – point scale was used in which the respondents indicated in evaluating the Multifunctional Transformable Table.

III. RESULTS AND DISCUSSION

A. The Benchmark Design of the Transformable Table

The patented innovation, commercial products, and local innovated instructional equipment that follow were benchmarked by the researcher in creating the design and the development of the "Multifunctional Transformable Table." The patented and developed products were considered in the design as they feature multifunctional characteristics and industry-standard trainer sets. The said features gave ideas into the creations of this Multifunctional Transformable Table to be transformable from a table into an instructional board either a whiteboard or an instructional trainer set. The instructional trainer set has two different instructional activities for electrical installation: building house wiring, electronic components, and full-wave rectifier wiring. The table can also be used as equipment and instructional tools, as well as equipment in a form a table that can be utilized as a teacher's table or a demonstration table. The instructional board can be used as a whiteboard for writing instruction or during lectures, as a projector screen for multimedia presentation and as a simulation board that serves as a trainer set.

The Innovations of the Multifunctional Transformable Table

The innovation introduced in the design and development of the transformable table are the following:

The Multifunctional Transformable Table can be transformed from a table into an instructional board such as the whiteboard and an instructional trainer set holder.



Fig. 2. Table form of Multifunctional Transformable Table



Fig. 3. Instructional Board (White Board) transformation of the Multifunctional Transformable Table

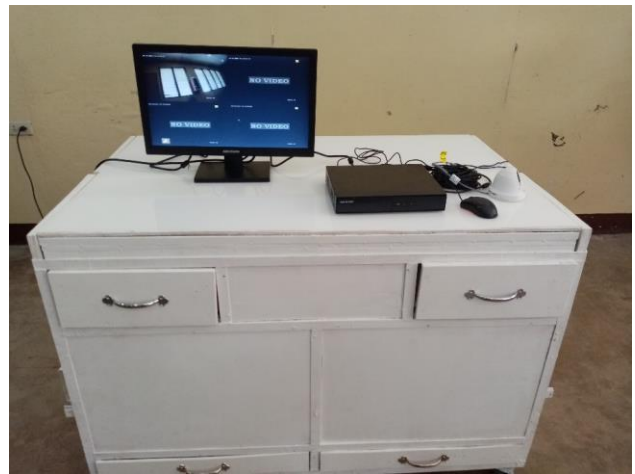


Fig. 6. Multifunctional Transformable Table used for demonstration.



Fig. 4. Instructional Board (Trainer Set Holder) transformation of the Multifunctional Transformable Table

3. The instructional board can be used as a whiteboard and a projector screen.



Fig. 6. Multifunctional Transformable Table used as a white board for instruction

2. The table can be used as a teacher's table and can be used for demonstration purposes



Fig. 5. Multifunctional Transformable Table used as a teacher's table.



Fig. 7. Multifunctional Transformable Table used as a projector screen for multimedia presentation

4. The instructional trainer set has two different instructional activities for electrical installation, which are for building house wiring and full-wave rectifier wiring. Also, the trainer set is removable when it's not in use.



Fig. 8. Multifunctional Transformable Table as instructional board with trainer set.



Fig. 10. Multifunctional Transformable Table in instructional board form without the trainer set.

4. The table has its storage area for the trainer set when it's not used.



Fig. 9. Trainer set inserted on the Multifunctional Transformable Table used for demonstration



Fig. 11. Inserting the trainer set inserted in its storage area

C. The Level of Acceptability of the Transformable Table

C.1. On Teachers Evaluation

1.a. Usability

Table –I: Teachers' Evaluation on the Multifunctional Transformable Table in terms of its Usability

Indicators	Mean	SD	Descriptive Rating	Interpretation
a. The Multifunctional table provides training with fundamental principles of electrical installation wiring and full wave rectifier wiring.	4.70	0.48	Excellent	Highly Acceptable
b. The electrical components function according to the design specifications	4.90	0.32	Excellent	Highly Acceptable
c. The multifunctional table electrical control devices function to the design's specifications	4.90	0.32	Excellent	Highly Acceptable
d. The multifunctional table is appropriate for training purposes and effective for teaching-learning process.	4.80	0.42	Excellent	Highly Acceptable
Overall	4.83	0.26	Excellent	Highly Acceptable

Legend:

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable
2.60 – 3.39	Good	Moderately Acceptable
1.80 – 2.59	Average	Not Acceptable
1.00 – 1.79	Poor	Highly Not Acceptable

It can be noted in Table 1 that the electrical components' function according to the design specifications and the multifunctional table electrical control devices' function to the design's specifications got the highest mean of 4.90 which is described as excellent and interpreted as highly acceptable. Also, the aspect whether the Multifunctional table provides training with fundamental principles of electrical installation wiring and full-wave rectifier wiring got the lowest mean of 4.70, which is described as excellent and interpreted as highly acceptable.

With an overall mean of 4.83, the multifunctional transformable table was rated by teachers as excellent, which means it is highly acceptable in terms of its usability.

The results imply that the teachers believed the table could be used as an instructional tool or equipment in teaching as it can provide learning in the principles of electrical wiring installation and full-wave rectifier wiring, and it is appropriate for training purposes and for effective teaching-learning process. Also, its components and control devices function accordingly to its design.

1.b. Portability

Table –II: Teachers' Evaluation on the Multifunctional Transformable Table in terms of its Portability

Indicators	Mean	SD	Descriptive Rating	Interpretation
a. The multifunctional table has stable foundation.	4.60	0.52	Excellent	Highly Acceptable
b. The multifunctional table can be accommodated in an average sized room.	4.90	0.32	Excellent	Highly Acceptable
d. The multifunctional table is manageable to transfer in any location.	4.60	0.52	Excellent	Highly Acceptable
Overall	4.70	0.25	Excellent	Highly Acceptable

Legend:

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable
2.60 – 3.39	Good	Moderately Acceptable
1.80 – 2.59	Average	Not Acceptable
1.00 – 1.79	Poor	Highly Not Acceptable

It can be observed in Table 2 that the multifunctional table can be accommodated in an average-sized room which got the highest mean of 4.90, and is described as excellent and interpreted as highly acceptable. While both on its stability of its foundation and on its movability or mobility it got the lowest mean of 4.60, which was still described as excellent and interpreted as highly acceptable.

With an overall mean of 4.70, the table was rated by teachers as excellent, which implies that it is highly acceptable in terms of portability.

The rating further implies that the teachers regarded this multifunctional transformable table can be accommodated in an average-sized room, and its stable foundation can

support the table in transporting from one place to another with ease.

1. c. Aesthetics

Table –III: Teachers’ Evaluation on the Multifunctional Transformable Table in terms of its Aesthetics

Indicators	Mean	SD	Descriptive Rating	Interpretation
a. The multifunctional table has a unique design and workmanship.	4.60	0.52	Excellent	Highly Acceptable
b. The multifunctional table has a presentable appearance.	4.50	0.53	Excellent	Highly Acceptable
c. The multifunctional table components are properly mounted.	4.60	0.52	Excellent	Highly Acceptable
d. Wiring connections are properly assembled and neatly installed.	4.70	0.48	Excellent	Highly Acceptable
e. The trainer’s components and accessories are well-situated.	4.80	0.42	Excellent	Highly Acceptable
Overall	4.64	0.34	Excellent	Highly Acceptable

Legend:

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable
2.60 – 3.39	Good	Moderately Acceptable
1.80 – 2.59	Average	Not Acceptable
1.00 – 1.79	Poor	Highly Not Acceptable

As shown in Table 3, both the aspect of the trainer's components and accessories being well-situated earned the highest mean of 4.80, which was described as excellent and interpreted as highly acceptable. On the

other hand, the presentability of appearance of the multifunctional table got the lowest mean of 4.50, which was described as excellent and interpreted as highly acceptable.

With an overall mean of 4.64, the multifunctional table was rated by teachers as excellent, which means that it is highly acceptable in terms of aesthetics.

The results gathered imply that the table was designed with proper and precise components and devices and its unique design and workmanship showed that the multifunctional transformable table has a presentable appearance.

1. d. Safety

Table –IV: Teachers’ Evaluation on the Multifunctional Transformable Table in terms of its Safety

Indicators	Mean	SD	Descriptive Rating	Interpretation
a. All moving parts are properly guarded and labelled	4.60	0.52	Excellent	Highly Acceptable
b. All wiring connections are properly insulated	4.90	0.32	Excellent	Highly Acceptable
c. The trainer does not pose serious risk of physical injury to the users	4.50	0.53	Excellent	Highly Acceptable
Overall	4.67	0.31	Excellent	Highly Acceptable

Legend:

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable
2.60 – 3.39	Good	Moderately Acceptable
1.80 – 2.59	Average	Not Acceptable
1.00 – 1.79	Poor	Highly Not Acceptable

Table 4 shows that the aspect on the proper insulation of wiring connections which earned the highest mean of 4.90, and is described as excellent and interpreted as highly acceptable. On the aspect where the trainer is free from any serious risk or physical injury to the users got the lowest mean of 4.50, which described as excellent and is interpreted as highly acceptable.

With an overall mean of 4.67, the table was rated by teachers as excellent, which means that it is highly acceptable in terms of safety.

The results showed that in terms of safety, the multifunctional table does not present a serious risk to users in a matter of physical injury as all of its wiring connections were properly insulated, and its parts were guarded and appropriately labelled.

Table 5. Summary of the Teachers' Evaluation of the Multifunctional Transformable Table

Criteria	Mean	Descriptive Rating	Interpretation
Usability	4.83	Excellent	Highly Acceptable
Portability	4.70	Excellent	Highly Acceptable
Aesthetics	4.64	Excellent	Highly Acceptable
Safety	4.67	Excellent	Highly Acceptable
Overall	4.71	Excellent	Highly Acceptable

Legend:

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable
2.60 – 3.39	Good	Moderately Acceptable
1.80 – 2.59	Average	Not Acceptable
1.00 – 1.79	Poor	Highly Not Acceptable

As shown in Table 5, teachers rated that the usability of the multifunctional transformable table got the highest mean of 4.83, which is described as excellent and interpreted as highly acceptable. While on its aesthetics aspects it was rated 4.64, which is described as excellent and interpreted as highly acceptable.

With an overall mean of 4.71, the table was rated by teachers as excellent, which means that it is highly acceptable.

The result implies that the Multifunctional Transformable Table is acceptable by the teacher respondents. It means that the table could help them in providing training and teaching-learning activities in teaching subjects for Industrial Arts students. Also, it may help teachers or instructors make instruction more engaging to students as it simulates real scenarios outside the classrooms four corners.

C.2. On Students' Evaluation

2. a. Usability

Table –VI: Students' Evaluation on the Multifunctional Transformable Table in terms of its Usability

Indicators	Mean	SD	Descriptive Rating	Interpretation
a. The Multifunctional table provides training with fundamental principles of electrical installation wiring and full wave rectifier wiring.	4.88	0.33	Excellent	Highly Acceptable
b. The electrical components function according to the design specifications	4.88	0.33	Excellent	Highly Acceptable
c. The multifunctional table electrical control devices function to the design's specifications.	4.93	0.27	Excellent	Highly Acceptable
d. The multifunctional table is appropriate for training purposes and effective for teaching-learning process.	4.90	0.30	Excellent	Highly Acceptable
Overall	4.89	0.29	Excellent	Highly Acceptable

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable

2.60 – 3.39	Good	Moderately Acceptable	1.80 – 2.59	Average	Not Acceptable	
1.80 – 2.59	Average	Not Acceptable	1.00 – 1.79	Poor	Highly	Not
1.00 – 1.79	Poor	Highly	Not	Acceptable		

It can be noted in Table 6 that the multifunctional table electrical control devices function to the design's specifications which got the highest mean of 4.93, described as excellent and interpreted as highly acceptable. While both its provision of training with fundamental principles of electrical installation wiring and full-wave rectifier wiring as well its electrical components function according to the design specifications got the lowest mean of 4.88 which is described as excellent and interpreted as highly acceptable.

With an overall mean of 4.89, students rated the table as excellent which means it is highly acceptable in terms of its usability.

The results showed that the students believed the table could be used for the instructional purpose in learning the basic principles of electrical wiring installation and full-wave rectifier wiring. Also, it is appropriate for training and teaching-learning purposes.

2.b. Portability

Table _VII: Students' Evaluation on the Multifunctional Transformable Table in terms of its Portability

Indicators	Mean	SD	Descripti ve Rating	Interpretat ion
a. The multifunctional table has stable foundation.	4.78	0.42	Excellent	Highly Acceptable
b. The multifunctional table can be accommodated in an average sized room.	4.83	0.45	Excellent	Highly Acceptable
d. The multifunctional table is manageable to transfer in any location.	4.83	0.45	Excellent	Highly Acceptable
Overall	4.81	0.35	Excellent	Highly Acceptable

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable
2.60 – 3.39	Good	Moderately Acceptable

It can be observed in Table 7 that both the accommodativeness of the multifunctional table and its portability got the highest mean of 4.83, which was described as excellent and was interpreted as highly acceptable, while the stability of the multifunctional table got the lowest mean of 4.78, which was described as excellent and was interpreted as highly acceptable.

With an overall mean of 4.81, the students rated the table as excellent, which means that it is highly acceptable in terms of its portability.

The result implies that the student perceived that the multifunctional transformable table could be transported with ease from one location to another.

2.c. Aesthetics

Table –VIII: Students' Evaluation on the Multifunctional Transformable Table in terms of its Aesthetics

Indicators	Me an	SD	Descripti ve Rating	Interpreta tion
a. The multifunctional table has a unique design and workmanship.	4.78	0.42	Excellent	Highly Acceptable
b. The multifunctional table has a presentable appearance.	4.85	0.36	Excellent	Highly Acceptable
c. The multifunctional table components are properly mounted.	4.80	0.41	Excellent	Highly Acceptable
d. Wiring connections are properly assembled and neatly installed.	4.85	0.36	Excellent	Highly Acceptable
e. The trainer's components and accessories are well-situated.	4.83	0.38	Excellent	Highly Acceptable
Overall	4.82	0.29	Excellent	Highly Acceptable

Range of Means	Description	Interpretation
4.20 – 5.00	Excellent	Highly Acceptable
3.40 – 4.19	Very Good	Acceptable

2.60 – 3.39 Good Moderately Acceptable
 1.80 – 2.59 Average Not Acceptable
 1.00 – 1.79 Poor Highly Not
 Acceptable

As shown in Table 8, both the aspects of multifunctional table's presentable appearance and the proper wiring connections were rated with the highest mean of 4.85, which was described as excellent and interpreted as highly acceptable. The multifunctional table has a unique design and workmanship got the mean of 4.78, which described as excellent and interpreted as highly acceptable. With an overall mean of 4.82, the students rated the table as excellent, which means it is highly acceptable in terms of aesthetics. These results imply that the table is presentable in appearance of which the components and devices were neatly and adequately installed. Also, it confirms that it has a unique design and workmanship.

2.d. Safety

Table -IX: Students' Evaluation on the Multifunctional Transformable Table in terms of its Safety

Indicators	Mean	SD	Descriptive Rating	Interpretation
a. All moving parts are properly guarded and labelled	4.85	0.36	Excellent	Highly Acceptable
b. All wiring connections are properly insulated	4.88	0.40	Excellent	Highly Acceptable
c. The trainer does not pose serious risk of physical injury to the users	4.85	0.36	Excellent	Highly Acceptable
Overall	4.86	0.32	Excellent	Highly Acceptable

Range of Means Description Interpretation
 4.20 – 5.00 Excellent Highly Acceptable
 3.40 – 4.19 Very Good Acceptable
 2.60 – 3.39 Good Moderately Acceptable
 1.80 – 2.59 Average Not Acceptable

1.00 – 1.79 Poor Highly Not
 Acceptable

Table 9 shows that the aspect on the proper insulations of wiring connections had the highest mean of 4.88, which was described as excellent and was interpreted as highly acceptable. Both aspects on the proper guarding and labelling of moving parts and the safety of the trainer was rated a mean of 4.85, which was described as excellent and was interpreted as highly acceptable. With an overall mean of 4.86, the students rated the table as excellent, which means it is highly acceptable in terms of safety. The results imply that the Multifunctional Transformable Table is safe to use, and it does not pose a risk to the user in a matter of physical injury according to students' evaluation as its components were labelled accordingly.

Table -X: Summary of the Students' Evaluation of the Multifunctional Transformable Table

Criteria	Mean	Descriptive Rating	Interpretation
Usability	4.89	Excellent	Highly Acceptable
Portability	4.81	Excellent	Highly Acceptable
Aesthetics	4.82	Excellent	Highly Acceptable
Safety	4.86	Excellent	Highly Acceptable
Overall	4.85	Excellent	Highly Acceptable

Range of Means Description Interpretation
 4.20 – 5.00 Excellent Highly Acceptable
 3.40 – 4.19 Very Good Acceptable
 2.60 – 3.39 Good Moderately Acceptable
 1.80 – 2.59 Average Not Acceptable
 1.00 – 1.79 Poor Highly Not
 Acceptable

As shown in Table 10 overall, students found that the usability of the multifunctional transformable table and rated its highest mean of 4.89, which is described as excellent and was interpreted as highly acceptable, while the portability of the table got the of 4.81, which is described as excellent and was interpreted as highly acceptable. With an overall mean of 4.85, the students rated the table as excellent, which means that it is highly acceptable in general. These results imply that the Multifunctional Transformable Table is highly acceptable for students as it can be a tool or equipment in learning subjects in Industrial Arts.

V. CONCLUSIONS

The benchmarked, patented and innovative products were credible models in the design and development of instructional tools like the Multifunctional Transformable Table, where in its development gave insights and guide in designing its transformable feature from a table to an instructional board - its multifunctional use as a teacher's table, demonstration table, whiteboard, projector screen, and trainer set or mockup for subjects in Industrial Arts. The innovation was introduced is the design of this table's transformable characteristics - as a table into an instructional board, instructional board as a whiteboard and a projector screen for multimedia presentations, and instructional board for trainer sets in electrical wiring installation and full-wave rectifier wiring. The Multifunctional Transformable Table was believed and highly accepted by both teachers and students as it exemplified its instructional use in terms of usability, portability, aesthetics, and safety. This multifunctional transformable table was perceived to be an effective instructional tool or equipment that would aid teachers and students in the teaching and learning process in Industrial Arts subjects. Moreover, this was believed to establish engagement for the students in the classroom learning activities.

REFERENCES

- [1]. Abceducation. "DO SCHOOL FACILITIES REALLY AFFECT A CHILD'S EDUCATION?", (<https://abceducation.weebly.com/poor-facilities-in-public-schools.html>) 2017
- [2]. Albarico, Shela H., Tagura, Mirasol O., Visitacion, Riah L., Dr. Magnetico, Judith A., Ramayan, Avril Joy R., Zabala, Vanessa B.. "Adequacy of Instructional Materials Used by Teachers in Teaching Technology and Livelihood Education" International Conference on Law, Education and Humanities (ICLEH'14) Jan. 30-31, 2014 Pattaya, Thailand. (<https://icehm.org/upload/6031ED0114516.pdf>) 2014
- [3]. Aggarwal, Anurag. "Advantages and Disadvantages of Using Visual Aids in Public Speaking". (<https://businessandpublicspeaking.in/2018/01/08/advantages-disadvantages-of-using-visual-aids-in-public-speaking/>) 2018
- [4]. Estela, Mae Josephine V. "Portable Drawing Board with mini Parallel Rule". Mindanao Polytechnic College. Cagayan de Oro City 2001
- [5]. LS3P Research (2012). Furniture For 21st Century Schools. (www.ls3p.com/wp-content/uploads/2013/08/21C-Schools_Furniture.pdf) 2012
- [6]. Owoh, Titus M. "REVELANCE OF INSTRUCTIONAL MATERIALS TO THE SUCCESSFUL IMPLEMENTATION OF ELECTRICAL INSTALLATION AND MAINTENANCE WORKS CURRICULUM AT TECHNICAL SCHOOL LEVEL IN ENUGU STATE" International Journal of Education and Research Vol. 4 No. 9 September 2016. (<file:///C:/Users/Janix/Dropbox/jan/tr/concept%20paper/25.pdf>)
- [7]. Pabatang, Osuardo A. Jr. "Development and Utilization of E-learning Module in Basic Electricity" Technological University of the Philippines, Manila. 2015
- [8]. Rosales, Victor S., Alenogines L. San Diego "Expanded Training Module for Electrical Installation and Maintenance National Certification Level Two". International Journal of Science, Engineering and Technology, 5:6. (<https://www.ijset.in/wp-content/uploads/10.2348.ijset05180202.pdf>) 2018
- [9]. Salisid, Franklin L. "Development of an Electrical Sequential Control Device for Instructional Purposes". Mindanao Polytechnic College. Cagayan de Oro City. 2002
- [10]. Sumalpong, Orlando D. Jr. "Refrigeration and Air Conditioning Instructional Trainer." Mindanao University of Science and Technology. Cagayan de Oro City. 2014
- [11]. Sumalpong, Orlando D. Jr. (2014). Refrigeration and Air Conditioning Instructional Trainer. Mindanao University of Science and Technology. Cagayan de Oro City.