ASSESSMENT OF ACCEPTABILITY OF MULTIPURPOSE DRAFTING TABLE FOR THE NEW NORMAL

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ABSTRACT. *The development of the Multipurpose Drafting Table that is multifunctional, aesthetically pleasing, more mobile, and more efficient to use might open up new possibilities for bringing home, classroom, or other learning environments more conducive to the new normal of teaching and learning. Thus, the aim of this study is to evaluate its acceptability which could be very useful in terms of making the table with multipurpose capabilities and easy-to-transfer abilities more convenient to use in the new normal settings. Students in Drafting and other technology-related disciplines can work and complete projects at any time and from any location using this innovation, especially if the activities involve internet access. To address this gap, this study used a survey research design and the primary researcher adopted a questionnaire for the evaluation of the Multipurpose Drafting Table in terms of Table's functionality, aesthetic functions, and ergonomics. Seventy-two students and experts in drafting technology and design-related fields were the participants in the study coming from two state universities in Mindanao, Philippines, namely USTP and CSUCC. Findings of the study revealed that the Multipurpose Drafting Table's functionality, aesthetic functions, and ergonomics were very highly acceptable. The results point to the conclusion that the Multipurpose Drafting Table has many functions in a single piece of furniture. This innovation not only satisfies its desired multifunctionality but also its aesthetic quality. Due to its modern and appealing style, it is pleasing to look at and can motivate study and encourage creativity. It is also easy to adjust, ideal for working in both standing and sitting positions, and permits movement and ensures good posture. This demonstrates how the ergonomics component of the innovation makes work more comfortable and can help students pay attention and concentrate in class. Building creative designs that enable educational transformation processes through flexible models to match current demands and future conditions can increase relevant teaching and learning greatly. Recommendations for further innovations and future studies are discussed in this study.*

Key Words: Acceptability Evaluation, Drafting and design-related fields, Multipurpose Drafting Table, Philippine state universities

INTRODUCTION

Background and Rationale of the Study

Education nowadays has changed dramatically with the distinctive rise of e-learning due to the emergence of the COVID-19 pandemic [1], whereby teaching is undertaken remotely and on digital platforms [2]. The recent shift to distance learning modalities has rendered the traditional assessment tools difficult to administer, if not totally obsolete [3]. It has become an urgent need to explore other innovative learning modalities that will facilitate migration from traditional to flexible teaching and learning options (CHED, 2020).

According to Oztok, et.al., to respond to the needs of learners in the Philippines, certain HEIs in the country have implemented proactive policies for the continuance of education despite the closure [4]. Most universities in the Philippines offer learning activities that may be completed either online or offline. Both involve technology and internet connection. This way, students can continue their education in remote setups through online/offline platforms, TV and radio, and printed modules [5].

The sudden shift to online learning has turned education on its head, and in many cases, it is the students who are having the toughest time [6]. All over the world, millions of students are affected and some already gave up their status of being a student. And one of the biggest challenges to address the problem of learning is the availability of internet connectivity [7] and access to school facilities [8].

In terms of internet connectivity in the Philippine context, a nationwide poll conducted by the Social Weather Stations (SWS) from November 21 to 25, 2020 reported that among 1,500 respondents, 39% of households with members aged five to twenty who are currently studying through online distance learning claimed they have a strong internet connection. Meanwhile, according to the poll results, 31% of households have a weak web connection with 21% stating it is somewhat weak and 9% saying it is very weak. On the other hand, 29% claimed their internet connectivity was fair [9]. The result of the said survey proved that an internet connection is both an issue and a challenge nowadays [7].

School facilities, on the other hand, is considered to be an integral component of the conditions of learning. The layout and design of the facility contribute to the place experience of students, educators, and community members. Aside from the physical structure, the facility includes building systems, furnishings, materials and supplies, equipment, and information technology [8].

In the laboratory rooms for Industrial Technology programs, such as Drafting, computers with Computer-Aided Design (CAD) software and drafting tables are essential tools and equipment that must be present and conveniently accessible to the students [10]. During their school laboratory sessions, students are permitted to use the computers and drafting tables as they see fit. However, when the pandemic struck, students in Drafting were compelled to look for ways in order to have laptops or computers at home, and build their own drafting tables or buy them online.

Drafting tables come in various top sizes and vertical adjustment considerations for normal drafting requirements. Drafting tables have many uses and can be used for drafting, drawing, painting, viewing large documents, crafts, hobbies,

or general writing [11]. They are still in use despite all the advances in computer-aided drafting [12]. They are still highly valued in institutions in the Philippines that provide Industrial Technology programs, such as University of Science and Technology of Southern Philippines (USTP) and Caraga State University Cabadbaran City (CSUCC), especially for boosting student learning and ideas.

There are numerous drafting tables on the market to choose from. There are sturdy drafting tables with tiltable desktop angles/adjustable tabletops that are portable and can be used for any drawing activity, are easy to use, and have pencil and scale holders. Some of the items are made from wood. Some are built with steel frames and tempered glass tops, as well as a built-in light. Others have their own storage compartments or sections. However, the majority of the existing drafting tables are designed to be permanent fixtures, really aren't multifunctional/multipurpose, are large and bulky, and are costly. For tracing drawing exercises, some tables do not have glass tabletops or lights. Others also have tabletops made of tempered glass, which are prone to spontaneous glass breakage [13-17]. Bringing these kinds of drafting tables, together with the required drafting tools, materials, and other equipment, from one location to another is a significant inconvenience for students, even teachers, especially those who have limited access to internet connections.

The main goal of this study is to evaluate a multifunctional, aesthetically pleasing, more mobile, and more efficient drafting table that will allow an individual to work and present outputs from anywhere. This will lessen the burden brought on by the pandemic to the Industrial Technology students and teachers and allow teaching and learning activities to continue despite constantly changing educational approaches and policies.

Specifically, this study sought to determine the tevel of acceptability of the Multipurpose Drafting Table (MDT) in terms of:

a. Functionality,
b. Aesthetics, and
c. Ergonomics.

METHODOLOGY

Research Design

This study aims to evaluate the acceptability of an MDT to satisfy the new normal demands at home, at any study place, and in the classroom for Drafting classes and other design-related fields. Designing and developing a MDT, more mobile, flexible, aesthetically pleasing, and more affordable product might open up new possibilities for bringing home, classroom, or other learning environments more conducive to the new normal of teaching and learning. This study used a survey research design. This research study used quantitative data as used in descriptive research.

Respondents of the Study

Students and experts in the field of drafting, civil, and other technology-related fields from the University of Science and Technology of Southern Philippines (USTP), Cagayan de Oro City, Philippines, and Caraga State University Cabadbaran City (CSUCC), Cabadbaran City, Agusan del Norte, Philippines, during the Second Semester of the Academic Year 2021–2022 were the participants in the study. There were 45 first-year students from the USTP enrolled in the Bachelor of Technology and Livelihood Education (BTLEd); 16 third-year and fourth-year students enrolled in the Bachelor of Science in Industrial Technology (BSIndTech) with a major in Architectural Drafting Technology and the Bachelor in Technical Vocational Teacher Education (BTVTEd) with a major in Architectural Drafting Technology from CSUCC; and 11 experts from both universities, including instructors in drafting, civil construction, and technology-related courses, as well as drafters and Computer-Aided Design (CAD) operators.

The 72 participants were selected through purposive sampling technique. They were chosen based on the following criteria: (a) they must be a registered student, faculty and staff of both universities (USTP and CSUCC), and (b) they must be engaged in technical drafting or drawing courses and courses relating to technology, either as instructors, students, or practitioners. The demographic profile of the respondents is presented in Table 1.

Research Instrument

For the purpose of this study, the researcher adopted a questionnaire on the evaluation of the MDT, particularly its acceptability in terms of Functionality, Aesthetics, and Ergonomics [18] [19]. Each item was measured using a five-point Likert Scale (Table 2).

Table 1: Demographic profile of the participants of the study

Characteristics		Frequency	Percentage
Age	15 to 20 years old	38	53
	21 to 25 years old	23	32
	26 to 30 years old	3	4.2
	31 to 35 years old	3	4.2
	36 years old and above	5	6.9
Sex	Female	40	56
	Male	32	44
SUC	USTP	46	64
	CSUCC	26	36

Table 2: Range of values and description for data analysis

Scale	Range	Description
5	4.20 – 5.00	Very Highly Acceptable (VHA)
4	3.40 – 4.19	Very Acceptable (VA)
3	2.60 – 3.39	Moderately Acceptable (MA)
2	1.80 – 2.59	Slightly Acceptable (SA)
1	1.00 – 1.79	Not Acceptable (NA)

Development of the MDT

The MDT for the new normal is conceptualized by the researcher based on benchmark designs from existing drafting tables commercially available. Benchmarking is the process of comparing an entity's strengths, weaknesses, business processes and performance metrics to its peers, competitors, industry leaders or best practices from other industries [20]. In order to determine the current needs of the new normal environment, the researcher in this study identified the problems that currently exist in the drafting technology laboratory classes, as well as the modern, adjustable drafting tables that are available on the market and their strengths, weaknesses, and processes.

The MDT was first designed using AutoCAD 2D software, then 3D modeling was completed using Google SketchUp, and finally, the design was produced using Lumion 3D Rendering Software. The design was subsequently developed using materials that were suitable for the project and easily accessible on the local market (Figure 1).

Figure 1. Computer-rendered model (top) and the physical-made model (bottom) of the MDT that was used in this study

Data Collection

After developing the MDT, the researcher requested permission from USTP and CSUCC to distribute the questionnaire for evaluation. After receiving approval, the MDT was evaluated on-site on June 13–17, 2022 at CSUCC, and on June 18, 2022 at USTP. As the participants evaluated the MDT, they were instructed that they are free to hold and utilize it. Subsequently the participants rated the MDT once they are ready.

Data Analysis

In the analysis of the data, the researcher used descriptive statistical techniques such as frequency count and percentage to the profile of the respondents; and mean and standard deviation to describe the level of acceptability of the MDT in terms of functionality, aesthetics, and ergonomics.

Ethical Consideration

The researcher first requested authorization from the college administration before beginning data gathering. The researcher did not start conducting the study or gathering data until she had received written consent from the college administration. Prior to the data collection, participants also received letters requesting their participation in the study. They were informed that the evaluation will take place in person and their participation was entirely optional and they might stop at any time.

RESULTS AND DISCUSSION

The results presented in this section sought to answer the research question of this study which was intended to determine the level of acceptability of the MDT in terms of functionality, aesthetics, and ergonomics.

Functionality

The results from the evaluation showed that the level of acceptability of the MDT in terms of functionality is Very Highly Acceptable (VHA) *(M = 4.68, SD 0.52)* as presented in Table 3.

Table 3

Assessment of the level of acceptability of the MDT in terms of functionality

Question Items for Functionality	Mean	SD	Description
1. The MDT is suited to serve as a drafting table with various angles of inclination.	4.78	0.42	VHA
2. The MDT is suited to serve as a regular table for a variety of projects and activities, as well as tasks requiring the use of laptops or other devices for CAD works.	4.60	0.57	VHA
3. The MDT is suited to serve as an easel or display board for drawing or painting purposes, output presentations, and class discussions.	4.74	0.47	VHA
4. The MDT is suited to serve as a tabletop display board for a set of project/ portfolio displays.	4.68	0.57	VHA
5. The MDT is appropriate for class demonstrations, laboratory activities, and other instructional and training purposes.	4.61	0.61	VHA
6. The MDT is highly recommended as a tool for new normal teaching-learning process.	4.67	0.50	VHA
Grand Total	4.68	0.52	VHA

Based on the findings, it is evident that the MDT can be used as a drafting table with varied angles of inclination, as a regular table, as an easel, and can be utilized as a tabletop display board. It is appropriate for instructional and training purposes and is also highly recommended for new normal teaching-learning processes.

The function can be expressed as the properties related to the use of a product. These properties include the relationship between a product and a consumer. On the basis of purchasing motivation, functionality (e.g. utility and practical function) is considered one of the systems of functions [21]. The results indicate that the MDT can be regarded as being immensely useful for both teachers and students because it has a variety of uses for a single piece of furniture. It can motivate teaching and learning because there are numerous ways to use it.

Aesthetics

In terms of aesthetics, the MDT obtained the Very Highly Acceptable (VHA) level of acceptability *(M = 4.65, SD = 0.56)* as presented in Table 4.

Table 4: Assessment of the level of acceptability of the MDT in terms of aesthetics

Question Items for Aesthetics	Mean	SD	Description
1. The MDT is composed of appropriate materials and painted with a suitable color to fit in the need for a relaxing appearance.	4.56	0.60	VHA
2. The MDT is suitable and adaptable for use in the classroom, at home, or in any other study environment for the new normal	4.67	0.60	VHA
3. The MDT has pleasing qualities that can motivate learning and stimulates creativity.	4.72	0.48	VHA
Grand Total	4.65	0.56	VHA

Aesthetic value means the complexity of the properties of objects, devices or equipment, which provide appeal, pleasure and good experience when it comes to sensation, action or indirectly, to the general human state of health related to a given object [21]. The results of this study show that industrial technology students may use the MDT to their advantage because they find it interesting and enjoyable, whether they are utilizing it at home or at school.

The MDT possessed both very highly acceptable qualities of its functionality and aesthetics. This shows that the MDT is both useful and beautiful. The results agree with what Lissak (1997) said, as cited by Antal, *et.al*. [21], that being useful also means being beautiful. There is no separate usefulness and beauty, but what is useful is considered beautiful as well. In the products such as furniture, they can only appear jointly. The findings also support Papanek's assertion from 2005 that objects in industrial design are made with the intention of satisfying not only aesthetic criteria but also criteria of utility and practical function. These demonstrate that using this MDT can be satisfying due to its modern and attractive appearance and many functions.

Ergonomics

In terms of ergonomics, the MDT obtained the Very Highly Acceptable (VHA) level of acceptability *(M = 4.65, SD = 0.56)* as presented in Table 5.

According to the results, the MDT is easy to adjust, ideal for working in both standing and sitting positions, and permits movement and ensures good posture. This shows that the MDT provides comfort while working and can promote concentration and attention in class, may it be at home or in school. Being the workplace of future workers, classrooms (or even at any study places) must be equipped with furniture that safeguards the physical well-being of students through appropriate ergonomics and the ability to adjust to their individual physical needs [22].

Table 5: Assessment of the level of acceptability of the MDT in *terms of ergonomics*

Question Items for Ergonomics	Mean	SD	Description
1. The MDT is easy to adjust to the desired height or inclinations.	4.43	0.68	VHA
2. The MDT is suitable for working in both standing and sitting positions.	4.67	0.58	VHA
3. The MDT allows movement and ensures good posture.	4.64	0.56	VHA
Grand Total	4.58	0.61	VHA

CONCLUSION

The MDT was developed from a benchmark design in order to assess the current needs of drafting courses and other technology-related programs in the new normal environment. With the involvement of participants from USTP and CSUCC in Mindanao, the Philippines, its level of acceptability in terms of functionality, aesthetics, and ergonomics was evaluated and was very highly accepted.

The results point to the conclusion that the MDT has many functions in a single piece of furniture. This innovation not only satisfies its desired multifunctionality but also its aesthetic quality. Due to its modern and appealing style, it is pleasing to look at and can motivate study and encourage creativity. It is also easy to adjust, ideal for working in both standing and sitting positions, and permits movement and ensures good posture. This demonstrates how the ergonomics component of the innovation makes work more comfortable and can help students pay attention and concentrate in class.

Since blended learning is undoubtedly on the way, this innovation will assist students and teachers in breaking free from the traditional classroom. Building creative designs that enable educational transformation processes through flexible models to match current demands and future conditions can increase relevant teaching and learning greatly.

Future researchers are encouraged to develop the findings of this study and include the feedback and ideas of the participants to develop yet another innovative study that might support the industrial technology programs in higher education's transition to the new normal educational environment.

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