HYBRID ORTHOPEDICALLY HANDICAPPED WHEELS MANEUVER (H.O.W. MANEUVER)

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INTRODUCTION

An electric bicycle, also known as an E-bike, power bike or booster bike, is a bicycle with an integrated electric motor which can be used for propulsion. Many kinds of E-bikes are available worldwide, from E-bikes that only have a small motor to assist the rider's pedal-power (peddlers) to somewhat more powerful E-bikes which tend closer to moped-style functionality. Some people with disabilities (PWD) use an existing wheelchair that intends them to exert some energy to move the wheelchair to other places. It is now timely in the part of new technology that focuses on creating less energy consumption in line with the use of using a E-wheelchair for persons with disability (PWD). This technology, E-wheelchair will be easier and more comfortable for people with disability (PWD) to utilize to give them ease of going to places they want.

The researchers innovated the latest creation of this E-Wheelchair created by the last year's graduating students of EARIST. And as their innovation, the researchers added a cover of the E-wheelchair to ensure the safety of the E-wheelchair user and innovated the handle bar into a round type to make it more comfortable while driving.

GENERAL OBJECTIVE

This study aimed to develop a Hybrid Orthopedically Handicapped Wheels Maneuver (H.O.W. Maneuver).

The main objective of the design entitled "Hybrid Orthopedically Handicapped Wheels Maneuver" is to help the physically incapacitated people to drive a vehicle on their own.

STATEMENT OF THE PROBLEM

The study specifically sought to answer the following objectives:

1. What are the problems encountered in the current system used in Hybrid Orthopedically Handicapped Wheels Maneuver?

2. What system can be proposed to improve the current system?

3. What are the similarities and differences of the current and proposed system?

4. What is the assessment of the two groups of respondents namely; Teaching and Non Teaching in terms of the following criteria? Is there any significant difference?

a. Functionality

b. Usability

c. Reliability

d. Efficiency

e. Maintainability

5. What claims can be derived from the developed system?

METHODOLOGY

The research used the developmental type of research which has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness. Developmental research is particularly important in the field of instructional technology. The most common types of developmental research involve situations in which the product-development process is analyzed and described, and the final product is evaluated. A second type of developmental research focuses more on the impact of the product on the learner or the organization. A third type of study is oriented toward a general analysis of design development or evaluation processes as a whole or as components. A fundamental distinction should be made between reports of actual developmental research (practice) and descriptions of design and development procedural models (theory). Although it has frequently been misunderstood, developmental research has contributed much to the growth of the field as a whole, often serving as the basis for model construction and theorizing (Richey, 1994). The method of sampling is purposively in nature. The purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts within. Purposive sampling may also be used with both qualitative and quantitative research techniques.

The inherent bias of the method contributes to its

efficiency, and the method stays robust even when tested against random probability sampling. Choosing the purposive sample is fundamental to the quality of data gathered; thus, reliability and competence of the informant must be ensured. (Tongco, 2007).

DATA GATHERING PROCEDURE

In developing this project, the following steps were undertaken:

1. Research about the e-bike
2. Title submission, "Hybrid Orthopedically Handicapped Wheels Maneuver"
3. Collecting References. The researcher collected some data from various books and the internet for the product.
4. Consultation to make the project more useful.
5. Canvassing the prices of materials needed for the product.
6. Overviewing to see if the project would be very useful in the future.
7. Installation of the materials to the product.
8. Trial and testing of the product.
9. Finalizing the product.
10. Result

SUMMARY OF FINDINGS

SOP 1. What are the problems encountered in the current system used in Hybrid Orthopedically Handicapped Wheels Maneuver?

- The following problems are commonly encountered in the present system used in Hybrid Orthopedically Handicapped Wheels Maneuver:

A. Bicycle Handlebar

The handlebar used was hard to turn the front wheels right, left, and rotate the e-bike.

B. Ramp

Ramp is too short to make it in high-angled elevation.

C. Flooring

They used aluminum as flooring, it is too slippery for the wheelchair.

SOP 2. What system can be proposed to improve the current system?

- To eliminate the problems, the researchers improved and changed the materials: for the flooring, they proposed rubber mat from aluminum that improved the system which is not slippery anymore the bicycle handlebar was

replaced by a hybrid steering wheel and handlebar to easily rotate and turn the front wheels and last and the ramp used by the driver to go inside the e- bike, the ramp was extended to have a high-angle elevation that would give safety to the driver when going in.

S0P 3. What are the similarities and differences of the current and proposed system?

- For the similarities: the researchers' improved system has a throttle for the acceleration of the said invention/ wheelchair for the foundation of the said Invention, motor to give life to the said invention; brake for the slowing down/stop of the said invention; and wheels for the movement of the said invention.

- For the differences: the researchers developed a more functional framework carrier, steering wheel, windshield, rubber mat, and ramp.

SOP 4. What is the assessment of the two groups of respondents namely; Teaching and Non-Teaching in terms of the following criteria? Is there any significant difference?

Table 1: Summary of Assessments on H.O.W. Maneuver

Indicators	Profess	ional	Stude	nt	Compos	ite	Rank
	WM	VI	WM	VI	WM	VI	
1 Functionality	4.71	E	4.40	E	4.56	E	3
2 Usability	4.67	E	4.67	E	4.67	E	1
3 Reliability	4.77	E	4.40	E	4.58	E	2
4 Efficiency	4.44	E	4.36	E	4.40	E	5
5 Maintainability	4.62	E	4.31	E	4.47	E	4
Overall Weighed Mean	4.61	E	4.36	E	4.48	E	

Looking at the summary table, it could be deduced that the respondents rated all of the indicators as "Excellent" with a composite mean value of 4.67 for usability Ranked 1; 4.58 for reliability Ranked 21 4.56 for functionality Ranked 3: 4.47 for maintainability Ranked 4: and 4.40 for efficiency Ranked 5 having a grand mean of 4.48 verbally interpreted as "Excellent" The data shows that the H.O.W. Maneuver in terms of its functionality, usability, efficiency, and maintainability was viewed as an excellent system by both the Professionals and Students.

SOP 5. What claims can be derived from the developed system? The following claims were derived in the developed system:

A. A steering wheel that can make the maneuver easy.

B. A windshield for protection.

C. Elongated Ramp to lessen the difficulty to go up or go down the carrier.

CONCLUSIONS

Based on the conclusions are drawn; findings of the study, the following

a. Functionality

According to the evaluation results of the functionality of the system, the degree to which the sets of functional completeness, correctness, and appropriateness were interpreted as "Excellent" by the respondents, which means that the functionality of the system covered all the specified task and user objectives. The system provided correct results with the needed degree of precision and facilitated the accomplishment of specified tank objectives. and

b. Usability

According to the evaluation results of the usability of the project, the degree to which the operability and accessibility of the system are interpreted as "Excellent" by the respondents, which means that the system had an aspect that it was easy to control and operate. And its accessibility can be used by the people with widest range of characteristics and specified context.

c. Reliability

The reliability of the system was interpreted as "Excellent" by the respondents. This implies that the reliability of the system met the reliability under normal operation and that the system was operational and was accessible when required to use.

d. Efficiency

The efficiency of the system was interpreted as "Excellent" by the respondents. It indicates that the efficiency of the system covered all the specified task and user objectives with an efficient response and processing rates when performing its function, met the requirements with its efficient resource utilization when performing its functions and the efficiency of its capacity to meet the requirements to the maximum limits

e. Maintainability

According to the evaluation results of the maintainability of the project, the degree to which the modularity, modifiability and reusability of the system were interpreted as "Excellent" by the

respondents, which means that the system had an aspect that it is modulate and modify. And its reusability can be used by the people or future researchers to the next project.