



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**A STUDY ON PSYCHOPHYSICAL TO ENHANCING
COMFORTABILITY AMONG OCCUPATIONAL DRIVER IN
MALAYSIA**

This report submitted in accordance with requirement of the Universiti Teknikal
Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering
(Management) (Hons.)

by

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FACULTY OF MANUFACTURING ENGINEERING

2013

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: A STUDY ON PSYCHOPHYSICAL TO ENHANCING COMFORTABILITY AMONG OCCUPATIONAL DRIVER IN MALAYSIA

SESI PENGAJIAN: 2012/13 Semester2

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I hereby, declared this report entitled “A Study on Psychophysical to Enhancing Comfortabilty among Occupational Driver” is the results of my own research except as cited in references.

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ABSTRACT

Comfortability is important to human especially for occupational driver in Malaysia. In general the psychophysical approach is concerned with human sensation associated with external physical stimuli. Psychophysical will relate between human sensations of occupational driver with external physical stimuli to give comfortability to them during their driving or after their driving. The purpose of this study is to implicate psychophysical approach and method into comfortability to make more comfortable among them. By using questionnaire, vibration and heart rate tool to evaluating heart rate of driver. At the end of this study, the researcher gets the most discomfort road during the driving among occupational driver.

ABSTRAK

Keselesaan adalah penting kepada manusia terutamanya bagi para pemandu di Malaysia. Secara umumnya pendekatan psychophysical adalah berkenaan dengan sensasi manusia yang dikaitkan dengan rangsangan fizikal luaran. Psychophysical akan berkaitan antara perasaan pemandu dengan rangsangan fizikal luaran yang akan memberi keselesaan kepada pemandu semasa atau selepas memandu. kajian ini bertujuan untuk mengaitkan antara psychophysical dan keselesaan pemandu. soal selidik ini menggunakan getaran dan alat kadar jantung untuk menilai kadar jantung pemandu. Pada akhir kajian ini, penyelidik dapat mengenalpasti jalan yang paling tidak selesa semasa memandu di kalangan pemandu di Malaysia.

DEDICATION

To my beloved parents (Mohd Jahari Bin Jusoh and Aesah Binti Ngah), family and friend who have given their support, encouragement and good advice to me.

ACKNOWLEDGEMENT

First and foremost, I thank the almighty god (Allah s.w.t) for being my side throughout. I wish to extend my sincere thanks to Dr. Seri Rahayu Binti Kamat as my supervisor for helping and guiding me throughout the development of the research. I am grateful to thank my colleagues Ms. Siti Noridayu Binti Samad and Mr. Mohd Hazwan Bin Sharif Hassan, as many creative thought and valuable discussion about the research have had a significance influence throughout my project development. Also not to forget the Faculty of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka for allowing me to be a part of the network and thus giving useful knowledge and experiences. In addition, I am especially to my parents, Mrs. Aesah Binti Ngah and Mr. Mohd Jahari Bin Jusoh for their love, support , encouragement and understanding during my studies.

TABLE OF CONTENT

Abstract	i
Abstrak	ii
Dedication	iii
Acknowledgement	iv
Table of Content	v
List of Tables	ix
List of Figure	x
List Abbreviations, Symbols and Nomenclatures	xii
CHAPTER 1: INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objective	3
1.4 Scope	4
CHAPTER 2: LITERATURE REVIEW	5
2.1 Definition of Comfortability	5
2.1.1 Comfort Model	6
2.1.2 Element of Comfort Model	7
2.1.1.1 History	7
2.1.1.2 State	7
2.1.1.3 Visual input	7
2.1.1.4 Noise	8
2.1.1.5 Temperature and Humidity	8
2.1.1.6 Posture and Movement	8
2.1.1.7 Pressure	8
2.2 Driver Comfortability	9
2.2.1 Safety	9
2.2.2 Seating Comfort	9

2.2.3	Vibration	11
2.2.4	Design	12
2.2.5	Road	13
2.3	Psychophysical	13
2.3.1	Psychophysical Method	14
2.3.2	Psychophysical today	14
2.3.3	stress	15
2.3.4	fatigue	15
2.3.4.1	Fatigue and Discomfort	16
2.3.4.2	Fatigue and Pain	16
CHAPTER 3: METHODOLOGY		17
3.1	Project Planning	17
3.2	Procedure Flow Chart	19
3.3	Questionnaire	20
3.3.1	Basic Information Driver	20
3.3.2	Road Comfortability	21
3.3.3	Driver Physical Comfort	21
3.4	Whole Body Vibration Tool	21
3.4.1	How WBV is Performed	22
3.5	Heart Rate Tool	22
3.5.1	Heart Rate Tool Performed	23
3.5.2	Factor Affect Heart Rate	24
3.6	Analysis Data	24
CHAPTER 4: RESULT AND DISCUSSION		26
4.1	Questionnaire Respond Analysis	26
4.1.1	Basic Information Questionnaire	27
4.1.1.1	Gender	27
4.1.1.2	Age	28
4.1.1.3	Weight	29
4.1.1.4	Height	30
4.1.1.5	Driving Experience	31
4.1.1.6	Type of Vehicle	32

4.1.1.7	Average Journey in One day (hour)	33
4.1.1.8	Average Journey in One day (km)	34
4.1.1.9	Fatigue Time During Driving	35
4.1.1.10	Health Diseases	36
4.1.2	Road Comfortability	37
4.1.2.1	Driving up The Hill	38
4.1.2.2	Driving Down The Hill	39
4.1.2.3	Driving at The Highway	39
4.1.2.4	Driving at Winding Road	39
4.1.3	Physical Comfort	40
4.1.4	Questionnaire Relationship	44
4.2	Vibration result	45
4.2.1	Vibration Summary	57
4.3	Heart Rate	58
4.3.1	Experiment Questionnaire	58
4.3.1.1	Level of Comfort Before Start Journey	59
4.3.1.2	Level of Comfort During Driving Flat Road	59
4.3.1.3	Level of Comfort During Driving In Winding Road	59
4.3.1.4	Level of Comfort During Driving Up The Hill	59
4.3.1.5	Level of Comfort During Driving Down The Hill	60
4.3.1.6	Level of Comfort During Finish The Journey	60
4.3.1.7	Relation between Questionnaire and Experiment	61
4.3.2	Heart Rate Assessment	62
4.3.3	Relation between Heart Rate and The Questionnaire	64
4.4	Discussion The Significance of The Heart Rate and The Road Condition	65
CHAPTER 5: CONCLUSION AND SUGGESTION		68
5.1	Conclusion	69
5.2	Suggestion	69
5.2.1	Vibration	70
5.2.2	Heart Rate	70

5.2.3 Comfortability	70
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REFERENCES	71
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APPENDICES

Appendix A: Gantt Chart PSM 1

Appendix B: Gantt Chart PSM 2

Appendix C: Questionnaire Survey

Appendix D: Questionnaire for experiment

LIST OF TABLES

2.1	Comfort and discomfort	10
3.1	Degree of Comfortability Satisfaction	20
4.1	Response of Question 1	27
4.2	Response of Question 2	28
4.3	Response of Question 3	29
4.4	Response of Question 4	30
4.5	Response of Question 5	31
4.6	Response of Question 6	32
4.7	Response of Question 7	33
4.8	Response of Question 8	34
4.9	Response of Question 9	35
4.10	Response of Question 10	36
4.11	Road Comfort Likert Scale	37
4.12	Road Comfort Response	38
4.13	Physical Comfort Likert Scale	41
4.14	Response of Physical Comfort	41
4.15	Parameter Description	47
4.16	Result of The Vibration	57
4.17	Level of Comfort	58
4.18	Level of Heart Rate of Respondent	63
4.19	F Test	65
4.20	T test	66

LIST OF FIGURE

2.1	Comfort model	6
2.2	Element of comfort model	7
2.3	A concept model of discomfort and comfort	10
2.4	Optimal seatback and seat pan inclination according to recent studies and “comfort angles”	11
2.5	Psychophysical method	14
3.1	Flow Chart of methodology	18
3.2	Vibration Calibrator	22
3.3	Polar Heat Rate Monitor	23
3.4	Polar Heat Rate Monitor Instruction	23
4.1	Pie Chart for Responses Question 1	28
4.2	Bar Chart for Age Among Participate	29
4.3	Weight Volume	30
4.4	Height Volume	31
4.5	Driving Experience	32
4.6	Type of Vehicle	33
4.7	Average Journey (Km)	34
4.8	Average Journey (Hour)	35
4.9	Fatigue Time	36
4.10	Health Diseases	37
4.11	Road Comfortability	40
4.12	Response of Discomfort	43
4.13	Data for Respondent 1	48
4.14	Data for Respondent 2	49
4.15	Data for Respondent 3	50
4.16	Data for Respondent 4	51
4.17	Data for Respondent 5	52

4.18	Data for Respondent 6	53
4.19	Data for Respondent 7	54
4.20	Data for Respondent 8	55
4.21	Data for Respondent 9	56
4.22	Bar Chart of Response of Discomfort Feeling	61
4.23	Average Heart Rate versus Road Condition	64

LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

WBV	-	Whole Body Vibration
PFD	-	Process flow diagram
r.m.s	-	root mean square
A1	-	exposure at 1 hour
A2	-	exposure at 2 hour
A4	-	exposure at 4 hour
A8	-	exposure at 8 hour
P.P	-	peak to peak time
VDV	-	vibration dose value
EAV	-	exposure action value
ALV	-	Exposure limit value

CHAPTER 1

INTRODUCTION

In this chapter, an introduction to the background of the final year project will be given. The project title is “A Study on Psychophysical in Enhancing Comfortability in Occupational Driver in Malaysia”. Then it will be followed by problem statement, objective and scope of the project.

1.1 Background of Study

An occupational driver is anyone who operates a motor vehicle as part of his or her job. This includes taxi driver, bus driver, and driver of company trucks, workers travelling from site to site on provincial roads, workers travelling to meetings, and workers picking up office supplies.

In general the psychophysical approach is concerned with human sensation associated with external physical stimuli. Within ergonomics, psychophysical methods have been used to quantify subjective (existing only within the experience mind) tolerance to occupational stress (Tycho K et al, 2010).

Besides that, comfortability is a sense of physical and freedom from pain or constraint. Comfort is influenced by many factors in the environment. That mean is not easy to describe and state what a comfort is. Comfort is very important for human and it also help to prevent injuries for human.

However at least three problem in striving for comfort;

- i. The exact cause of discomfort or comfort is unknown.
- ii. Every individual has his or her own meaning for comfort.
- iii. The comfort design process is not described, and the approach is unknown.

In a vehicle, a seat and often controls (related to hand and leg tool) are found among other element that influence comfort, such as view, climate, noise and vibration. Based on theory, we may know a comfortable seat and comfortable control for vehicle, but comfort in such a complicated environment that is determined by more factor than these. The relationship between driver and vehicle plays an important role in the specification of the aspect of comfortability.

Because comfort is a subjective phenomenon, more factors can be related to achieve comfortability. One of the factor that regardless of view is psychophysical. Psychophysical will relate between human sensation of occupational driver with external physical stimuli to give comfortability to them during their driving or after their driving. Implicate psychophysical approach and method into comfortability will more comfortable among them.

1.2 Problem Statement

Among driver in Malaysia, occupational driver will be exposed more discomfort environment compared to another driver. They will work related to their job almost their entire shift in road. It can be taken two, four, six or maybe eight to ten hours in the road. Furthermore, the occupational driver forced to through various condition or situation such as different weather and road. In this condition occupational driver will expose to several injuries such as fatigue, carpal tunnel syndrome and etc.

Many things that should be taking note to feel the comfortability among occupational driver such as;

- i. Seat comfort
- ii. Vibration
- iii. Dashboard and display
- iv. Climate control
- v. What is vehicle look like
- vi. Vehicle dimension, driver space
- vii. Noise reduction
- viii. View
- ix. Adjustability of seat and control
- x. Reliability of vehicle

Besides that, discomfort among occupational driver is different because comfort is about us. Based on that, this case study will investigate the whole body part to recognize which part is the most part that make uncomfortable among them.

1.3 Objective

The objectives to be achieved in this project are:

- To determine the requirement of occupational driver while driving (in term of comfortability)
- To study the psychophysical experiences among occupational drivers.
- To investigate the relationship between psychophysical factor and comfortability.

1.4 Scope

In this final year project, the scope will cover the below criterion. To collect data by make questionnaire among occupational driver in Malaysia such as taxi driver, bus driver, lorry driver and etc. Besides that, heart rate test will be conducted to test the heart rate of occupational driver relate with road condition. The study also will investigate relationship between psychophysical factor and comfortability of driver so that further improvement can be made after identifying the interaction between them. In addition this project main focus is at the upper body of respondent and the respondent are among occupational driver in Malaysia.

CHAPTER 2

LITERATURE REVIEW

In this section, the report will include details on the theories and scholarly details that had been derived from various sources such as journals, books, and case studies. The following theories that were included are related with the title of the project which is the investigation on Psychophysical in Enhancing Comfortability in Occupational Drivers in Malaysian.

The development to enhancing comfortability among Malaysia driver in doing a day's work has evolved. Comfort is influenced by many factors in the environment. Before this many research or journal talks and discuss about comfortable of seating vehicle but not the overall driver comfortability. Because of comfortability is influenced by many factors, one of the views that regardless are psychophysical. This study will cover the symptom that can increase comfortability for occupational drivers by using questionnaire and heart rate tool.

2.1 Definition of Comfortability

Everyone pays attention to comfort. In New Penguin English Dictionary 2000 by Van Dale, the comfortability is mean as “convenience of the interior, or thing which brings bodily ease”. According to Slater (1985) being define comfort as a pleasant state of physiological, psychological and physical harmony between a human being and his or her environment.

Despite the ongoing debate on the meaning of comfort, there are some issue that are generally accepted (Looze et al. 2003):

- i. Comfort is constructing of a subjectively defined personal nature.
- ii. Comfort is affected by various factors (physical, physiological and psychological
- iii. Comfort is a reaction to the environment

2.1.1 Comfort Model

Comfort could have three manifestations;

- i. Discomfort – the participant experiences discomfort because of physical disturbances in the environment
- ii. No discomfort – the participant is not aware of comfort or there is no discomfort.
- iii. Comfort – the participant experiences noticeably more comfort than expected and feel comfortable.

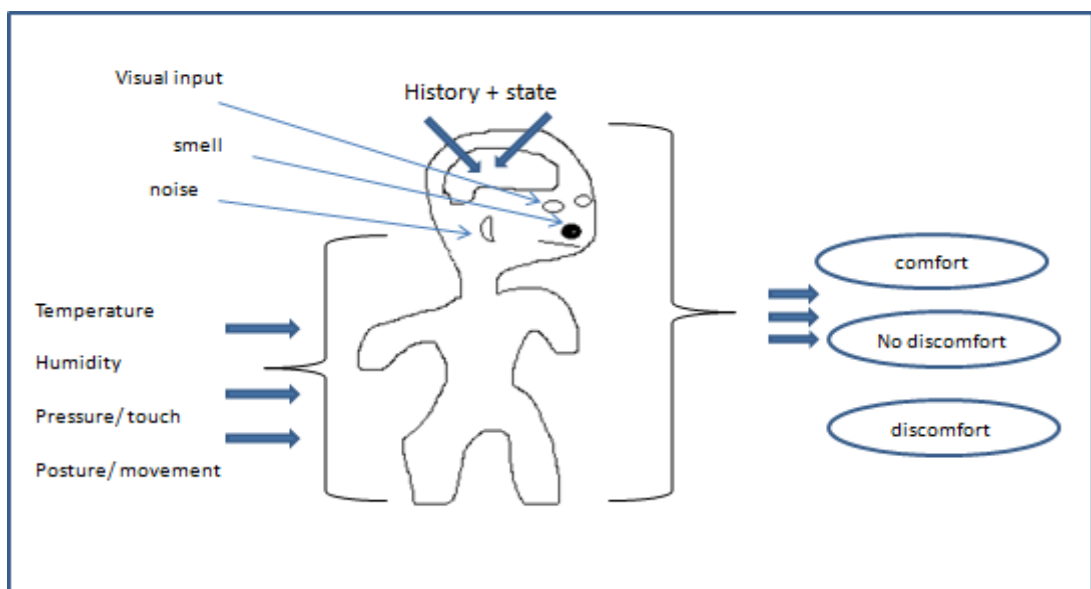


Figure 2.1: The Comfort Model

2.1.2 Element of Comfort Model

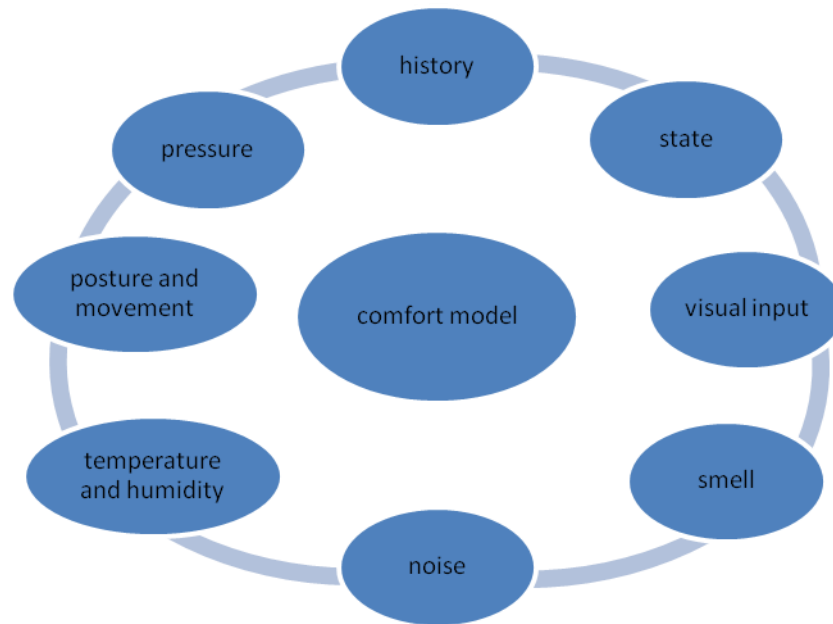


Figure 2.2: element of comfort model

2.1.1.1 History

Based on experience and acknowledgement the comfort will be detected.

2.1.1.2 State

Comfort will happen in a good area, condition, situation and environment.

2.1.1.3 Visual Input

Visual input means eyes. Eyes will see the visual of life and interpret it into feeling of comfortable.

2.1.1.4 Noise

Most of people will feel uncomfortable when in noise environment. It can make people stressful. But sometimes, several people make or occur with noise to entertaining their life.

2.1.1.5 Temperature and Humidity

Sometimes comfortable also depend on temperature. Very hot or cold temperature will make uncomfortable condition to human.

2.1.1.6 Posture and Movement

Situation where not in natural posture of body will causes uncomfortable to the human. Even it also can give injury to the human. Movement such as repetitive work is discomfort condition to human.

2.1.1.7 Pressure

Pressure divides to several types. One of that is human pressure. Human pressure will gives discomfort situation where people will stress with it.

2.2 Driver Comfortability

Driver comfort is as important as the functional since consumer are more and more concerned about safety and comfortable driving. Besides that, driver comfort are one of the factor that car manufacturer use to distinguish their product from their competitors. The current believe is that ‘comfort’ describes is a sense of physical or a subjective impression. While ‘comfortability’ mean the degree or standard to which something or someone is comfortable.

2.2.1 Safety

Safety means to protect against failure, breakage or other accident. Another word for safety is the condition of being safe. Safety and comfortability are related because when driver feel comfort with their condition, naturally it gives safety and confidence to the driver. Being safety means the car in good condition and has a safety precaution that include in the vehicle. Making sure your vehicle safe and driving to minimize risks.

2.2.2 Seating Comfort

Vehicle seat which are in contact with vehicle occupants, play an important role in improving the comfort and work of a driver and passenger. A good seat is thus essential to prevent a lot of painful disorders such as low back pain, a typical implication arising from a bad sitting posture (Giuseppe Andreoni et al, 2002).

The design and assessment of the car driver posture introduce additional complexity with respect to the study of a traditional sitting posture. First of all, the feet of a car driver do not generally assist the support of the body posture because they are primarily devoted to the use of pedal. Driving posture must assure wide visibility and easy reach of all the car display and control.