



Faculty of Cognitive Sciences and Human Development

**A MULTIMEDIA LEARNING SYSTEM FOR MALAYSIAN
NOVICE DRIVERS**

Esther Foo Hui Hui

**Bachelor of Science (Honours)
Cognitive Sciences
2010**

**LC
4704
F686
2010**

BORANG PENGESAHAN STATUS TESIS

Gred: A-

JUDUL : A MULTIMEDIA LEARNING SYSTEM FOR MALAYSIAN NOVICE DRIVERSSESI PENGAJIAN : 2009-2010/2Saya ESTHER FOO HUI HUI

(HURUF BESAR)

mengaku membenarkan tesis * ini disimpan di Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dengan syarat-syarat kegunaan seperti berikut:

1. Tesis adalah hakmilik Universiti Malaysia Sarawak.
2. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat pendigitan untuk membangunkan Pangkalan Data Kandungan Tempatan.
4. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.

** sila tandakan (✓)

☐

SULIT

(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan seperti termaktub di dalam AKTA RAHSIA RASMI 1972)

☐

TERHAD

(Mengandungi maklumat Terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

☒

TIDAK TERHAD



(TANDATANGAN PENULIS)



(TANDATANGAN PENYELIA)

Alamat Tetap:

67, Taman Hwata, Jln Ong Tiang Swee,
93200, Kuching, Sarawak

Tarikh : 06/05/2010Tarikh: 06/5/10

Catatan:

* Tesis dimaksudkan sebagai tesis bagi Ijazah Doktor Falsafah, Sarjana dan Sarjana Muda

*Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh tesis ini perlu dikelaskan sebagai TERHAD.

The project entitled 'A Multimedia Learning System for Malaysian Novice
A MULTIMEDIA LEARNING SYSTEM FOR MALAYSIAN NOVICE DRIVERS
Cognitive Sciences and Human Development in partial fulfillment of the
requirements for a Bachelor of Science with Honours (Cognitive Sciences).

ESTHER FOQ HUI HUI

Received for examination by


(Associate Professor Dr. Chen Chwen Jen)

Date:

This project is submitted in partial fulfilment of the requirements for a
Bachelor of Science with Honours
(Cognitive Science)

Grade

A-

Faculty of Cognitive Sciences and Human Development
UNIVERSITI MALAYSIA SARAWAK
(2010)

ACKNOWLEDGEMENT

TABLE OF CONTENTS

First and foremost, I would like to take this opportunity to thank my project supervisor Associate Professor Dr. Chen Chwen Jen for the valuable guidance, support, and advice throughout the process of working in this project. She has inspired me greatly to work in this project, and the willingness she has poured out to spend her valuable time to give explanation on the appropriate way to do the project, and has motivated me greatly throughout the process.

Furthermore, I would like to thank the authority of Universiti Malaysia Sarawak for providing me a great environment and facilities to complete my final year project. Moreover, many thanks for offering this subject (Cognitive Sciences) which allow me to learn about nature of human mind.

Finally, I would like to take this opportunity to thank my family and friends for all the support, motivation, and assistance in completing this project.

1.0 Background of the Study

1.3 Importance of the Study

1.4 Scope

CHAPTER 1 – LITERATURE REVIEW

2.0 Multimedia

2.1 The use of Multimedia for Training and Educating

Novice Drivers

2.1.1 In New Zealand

2.1.2 In Europe

2.1.3 In the United State of America

2.2 Multimedia Element

2.2.1 Video

2.2.2 Audio

2.2.3 Graphic

2.3 Mayer's Multimedia Principle

2.3.1 Multimedia Principle

2.3.2 Contiguity Principle

2.3.3 Modality Principle

TABLE OF CONTENTS		
	2.3.5.2 Coherence Principle: Avoid Extraneous Pictures	13
	2.3.5.3 Coherence Principle: Avoid Extraneous Words	
	2.4 Design and Development Model	14
Acknowledgement		iv
Table of Contents		v
List of Figure		viii
Abstract		xi
Abstrak		xii
METHODOLOGY		
	2.4 Design and Development Model of the Multimedia Learning System	16
	3.1 Planning	18
	3.1.1 Define the Scope	18
	3.1.2 Determine and Collect Resources	19
	3.1.3 Organize Resources	19
	3.1.3.1 Hardware	20
	3.1.3.1.1 Personal Computer	20
	3.1.3.1.2 Video Camera	21
	3.1.3.2 Software	21
	3.1.3.2.1 Video Editor	21
	3.1.3.2.2 Adobe Flash CS4	22
	3.1.3.3.1	23
	3.1.3.3.2	24
	3.1.3.3.3	25
	3.1.3.3.4	26
	3.1.3.3.5	27
	3.1.3.3.6	28
	3.1.3.3.7	29
	3.1.3.3.8	30
	3.1.3.3.9	31
	3.1.3.3.10	32
	3.1.3.3.11	33
	3.1.3.3.12	34
	3.1.3.3.13	35
	3.1.3.3.14	36
	3.1.3.3.15	37
	3.1.3.3.16	38
	3.1.3.3.17	39
	3.1.3.3.18	40
	3.1.3.3.19	41
	3.1.3.3.20	42
	3.1.3.3.21	43
	3.1.3.3.22	44
	3.1.3.3.23	45
	3.1.3.3.24	46
	3.1.3.3.25	47
	3.1.3.3.26	48
	3.1.3.3.27	49
	3.1.3.3.28	50
	3.1.3.3.29	51
	3.1.3.3.30	52
	3.1.3.3.31	53
	3.1.3.3.32	54
	3.1.3.3.33	55
	3.1.3.3.34	56
	3.1.3.3.35	57
	3.1.3.3.36	58
	3.1.3.3.37	59
	3.1.3.3.38	60
	3.1.3.3.39	61
	3.1.3.3.40	62
	3.1.3.3.41	63
	3.1.3.3.42	64
	3.1.3.3.43	65
	3.1.3.3.44	66
	3.1.3.3.45	67
	3.1.3.3.46	68
	3.1.3.3.47	69
	3.1.3.3.48	70
	3.1.3.3.49	71
	3.1.3.3.50	72
	3.1.3.3.51	73
	3.1.3.3.52	74
	3.1.3.3.53	75
	3.1.3.3.54	76
	3.1.3.3.55	77
	3.1.3.3.56	78
	3.1.3.3.57	79
	3.1.3.3.58	80
	3.1.3.3.59	81
	3.1.3.3.60	82
	3.1.3.3.61	83
	3.1.3.3.62	84
	3.1.3.3.63	85
	3.1.3.3.64	86
	3.1.3.3.65	87
	3.1.3.3.66	88
	3.1.3.3.67	89
	3.1.3.3.68	90
	3.1.3.3.69	91
	3.1.3.3.70	92
	3.1.3.3.71	93
	3.1.3.3.72	94
	3.1.3.3.73	95
	3.1.3.3.74	96
	3.1.3.3.75	97
	3.1.3.3.76	98
	3.1.3.3.77	99
	3.1.3.3.78	100
	3.1.3.3.79	101
	3.1.3.3.80	102
	3.1.3.3.81	103
	3.1.3.3.82	104
	3.1.3.3.83	105
	3.1.3.3.84	106
	3.1.3.3.85	107
	3.1.3.3.86	108
	3.1.3.3.87	109
	3.1.3.3.88	110
	3.1.3.3.89	111
	3.1.3.3.90	112
	3.1.3.3.91	113
	3.1.3.3.92	114
	3.1.3.3.93	115
	3.1.3.3.94	116
	3.1.3.3.95	117
	3.1.3.3.96	118
	3.1.3.3.97	119
	3.1.3.3.98	120
	3.1.3.3.99	121
	3.1.3.3.100	122
	3.1.3.3.101	123
	3.1.3.3.102	124
	3.1.3.3.103	125
	3.1.3.3.104	126
	3.1.3.3.105	127
	3.1.3.3.106	128
	3.1.3.3.107	129
	3.1.3.3.108	130
	3.1.3.3.109	131
	3.1.3.3.110	132
	3.1.3.3.111	133
	3.1.3.3.112	134
	3.1.3.3.113	135
	3.1.3.3.114	136
	3.1.3.3.115	137
	3.1.3.3.116	138
	3.1.3.3.117	139
	3.1.3.3.118	140
	3.1.3.3.119	141
	3.1.3.3.120	142
	3.1.3.3.121	143
	3.1.3.3.122	144
	3.1.3.3.123	145
	3.1.3.3.124	146
	3.1.3.3.125	147
	3.1.3.3.126	148
	3.1.3.3.127	149
	3.1.3.3.128	150
	3.1.3.3.129	151
	3.1.3.3.130	152
	3.1.3.3.131	153
	3.1.3.3.132	154
	3.1.3.3.133	155
	3.1.3.3.134	156
	3.1.3.3.135	157
	3.1.3.3.136	158
	3.1.3.3.137	159
	3.1.3.3.138	160
	3.1.3.3.139	161
	3.1.3.3.140	162
	3.1.3.3.141	163
	3.1.3.3.142	164
	3.1.3.3.143	165
	3.1.3.3.144	166
	3.1.3.3.145	167
	3.1.3.3.146	168
	3.1.3.3.147	169
	3.1.3.3.148	170
	3.1.3.3.149	171
	3.1.3.3.150	172
	3.1.3.3.151	173
	3.1.3.3.152	174
	3.1.3.3.153	175
	3.1.3.3.154	176
	3.1.3.3.155	177
	3.1.3.3.156	178
	3.1.3.3.157	179
	3.1.3.3.158	180
	3.1.3.3.159	181
	3.1.3.3.160	182
	3.1.3.3.161	183
	3.1.3.3.162	184
	3.1.3.3.163	185
	3.1.3.3.164	186
	3.1.3.3.165	187
	3.1.3.3.166	188
	3.1.3.3.167	189
	3.1.3.3.168	190
	3.1.3.3.169	191
	3.1.3.3.170	192
	3.1.3.3.171	193
	3.1.3.3.172	194
	3.1.3.3.173	195
	3.1.3.3.174	196
	3.1.3.3.175	197
	3.1.3.3.176	198
	3.1.3.3.177	199
	3.1.3.3.178	200
	3.1.3.3.179	201
	3.1.3.3.180	202
	3.1.3.3.181	203
	3.1.3.3.182	204
	3.1.3.3.183	205
	3.1.3.3.184	206
	3.1.3.3.185	207
	3.1.3.3.186	208
	3.1.3.3.187	209
	3.1.3.3.188	210
	3.1.3.3.189	211
	3.1.3.3.190	212
	3.1.3.3.191	213
	3.1.3.3.192	214
	3.1.3.3.193	215
	3.1.3.3.194	216
	3.1.3.3.195	217
	3.1.3.3.196	218
	3.1.3.3.197	219
	3.1.3.3.198	220
	3.1.3.3.199	221
	3.1.3.3.200	222
	3.1.3.3.201	223
	3.1.3.3.202	224
	3.1.3.3.203	225
	3.1.3.3.204	226
	3.1.3.3.205	227
	3.1.3.3.206	228
	3.1.3.3.207	229
	3.1.3.3.208	230
	3.1.3.3.209	231
	3.1.3.3.210	232
	3.1.3.3.211	233
	3.1.3.3.212	234
	3.1.3.3.213	235
	3.1.3.3.214	236
	3.1.3.3.215	237
	3.1.3.3.216	238
	3.1.3.3.217	239
	3.1.3.3.218	240
	3.1.3.3.219	241
	3.1.3.3.220	242
	3.1.3.3.221	243
	3.1.3.3.222	244
	3.1.3.3.223	245
	3.1.3.3.224	246
	3.1.3.3.225	247
	3.1.3.3.226	248
	3.1.3.3.227	249
	3.1.3.3.228	250
	3.1.3.3.229	251
	3.1.3.3.230	252
	3.1.3.3.231	253
	3.1.3.3.232	254
	3.1.3.3.233	255
	3.1.3.3.234	256
	3.1.3.3.235	257
	3.1.3.3.236	258
	3.1.3.3.237	259
	3.1.3.3.238	260
	3.1.3.3.239	261
	3.1.3.3.240	262
	3.1.3.3.241	263
	3.1.3.3.242	264
	3.1.3.3.243	265
	3.1.3.3.244	266
	3.1.3.3.245	267
	3.1.3.3.246	268
	3.1.3.3.247	269
	3.1.3.3.248	270
	3.1.3.3.249	271
	3.1.3.3.250	272
	3.1.3.3.251	273
	3.1.3.3.252	274
	3.1.3.3.253	275
	3.1.3.3.254	276
	3.1.3.3.255	277
	3.1.3.3.256	278
	3.1.3.3.257	279
	3.1.3.3.258	280
	3.1.3.3.259	281
	3.1.3.3.260	282
	3.1.3.3.261	283
	3.1.3.3.262	284
	3.1.3.3.263	285
	3.1.3.3.264	286
	3.1.3.3.265	287
	3.1.3.3.266	288
	3.1.3.3.267	289
	3.1.3.3.268	290
	3.1.3.3.269	291
	3.1.3.3.270	292
	3.1.3.3.271	293
	3.1.3.3.272	294
	3.1.3.3.273	295
	3.1.3.3.274	296
	3.1.3.3.275	297
	3.1.3.3.276	298
	3.1.3.3.277	299
	3.1.3.3.278	300
	3.1.3.3.279	301
	3.1.3.3.280	302
	3.1.3.3.281	303
	3.1.3.3.282	304
	3.1.3.3.283	305
	3.1.3.3.284	306
	3.1.3.3.285	307
	3.1.3.3.286	308
	3.1.3.3.287	309
	3.1.3.3.288	310
	3.1.3.3.289	311
	3.1.3.3.290	312
	3.1.3.3.291	313
	3.1.3.3.292	314
	3.1.3.3.293	315
	3.1.3.3.294	316
	3.1.3.3.295	317
	3.1.3.3.296	318
	3.1.3.3.297	319
	3.1.3.3.298	320
	3.1.3.3.299	321
	3.1.3.3.300	322
	3.1.3.3.301	323
	3.1.3.3.302	324
	3.1.3.3.303	325
	3.1.3.3.304	326
	3.1.3.3.305	327
	3.1.3.3.306	328
	3.1.3.3.307	329
	3.1.3.3.308	330
	3.1.3.3.309	331
	3.1.3.3.310	332
	3.1.3.3.311	333
	3.1.3.3.312	334
	3.1.3.3.313	335
	3.1.3.3.314	336
	3.1.3.3.315	337
	3.1.3.3.316	338
	3.1.3.3.317	339
	3.1.3.3.318	340
	3.1.3.3.319	341
	3.1.3.3.320	342
	3.1.3.3.321	343
	3.1.3.3.322	344
	3.1.3.3.323	345
	3.1.3.3.324	346
	3.1.3.3.325	347
	3.1.3.3.326	348
	3.1.3.3.327	349

2.3.4	Redundancy Principle	12
2.3.5	Coherence Principle	12
2.3.5.1	Coherence Principle: Avoid Extraneous Sound	13
2.3.5.2	Coherence Principle: Avoid Extraneous Pictures	13
2.3.5.3	Coherence Principle: Avoid Extraneous Words	14
2.4	Design and Development Model	14

CHAPTER 3-AN OVERVIEW OF THE MULTIMEDIA LEARNING SYSTEM

CHAPTER 3- METHODOLOGY

3.0	Design and Development Model of the Multimedia Learning System	16
3.1	Planning	18
3.1.1	Define the Scope	18
3.1.2	Brainstorming	19
3.1.3	Determine and Collect Resources	19
3.1.3.1	Subject Matter Resources	19
3.1.3.2	Web Resources	20
3.1.3.3	Delivery system resources	20
3.1.3.3.1	Hardware	20
3.1.3.3.1.1	Personal Computer	20
3.1.3.3.1.2	Video Camera	21
3.1.3.3.2	Software	21
3.1.3.3.2.1	Video Editor	21
3.1.3.3.2.2	Adobe Flash CS4	22
3.2	Design	23
3.2.1	Flow Chart	23
3.2.2	Story Board	24
3.2.3	Prototype	28
3.3	Development	29
3.3.1	Create Graphics	29
3.3.2	Produce Video	30
3.3.3	Record Audio	30

CHAPTER 4- DEVELOPEMENT

4.0	Development Process	31
-----	---------------------	----

LIST OF FIGURES

Figure 2.1	29
Video screenshot of CD-DRIVES	5
Figure 2.2	32
Red and Yellow circle drag to the corresponding area by learner	8
Figure 2.3	32
Simulation and video used to train novice drivers	9
Figure 2.4	33
Alessi and Trolip's Design and Development Model	14
Figure 3.1	34
Alessi and Trolip's Design and Development Model Adapted from (Alessi & Trollip, 2001)	17
Figure 3.2	35
Flow chart of the system flow	23
Figure 3.3	36
Rare mirror and vehicles in front are highlighted	24
Figure 3.4	36
Achieving the left signal	25
Figure 3.5	39
Left side mirror is highlighted	26
Figure 3.6	40
Driver turn to the left junction	27

Figure 3.7	
Prototype of the system design	29
Figure 4.1	
Videos are converted using Any Video Converter software	32
Figure 4.2	
Organize the sequence of scenes	32
Figure 4.3	
Trimming videos work	33
Figure 4.4	
Mute videos' background sound	34
Figure 4.5	
Include a narration in the video	35
Figure 4.6	
Publish video	35
Figure 4.7	
Include and position images on related video	36
Figure 5.1	
Images and contents for sub-title "Membelok ke Kanan" and "Membelok ke Kiri" from KPP text book	39
Figure 5.2	
Content on "Membelok ke kiri" presented in video and narration included	40
Figure 5.3	
Content on "Membelok ke kanan" presented in video with narration	41

ABSTRACT

Figure 5.4	
Images and contents for sub-title “Bulatan” from KPP text book	42
Figure 5.5	
First turning in roundabout presented in video	43
Figure 5.6	
Second turning in roundabout presented in video	44
Figure 5.7	
Third turning in roundabout presented in video	45
Figure 5.8	
U-turn in roundabout presented in video	46
Figure 5.9	
Image and texts used to explain on scenarios of “Pergerakan melintasi”	47
Figure 5.10	
Video used to explain on “Pergerakan Melintasi” scenario	48

ABSTRACT

ABSTRAK

A MULTIMEDIA LEARNING SYSTEM FOR MALAYSIAN NOVICE DRIVERS

SISTEM PEMBELAJARAN MULTIMEDIA UNTUK PEMANDU NOVIS MALAYSIA

Esther Foo Hui Hui

Esther Foo Hui Hui

This study aims to create a multimedia learning system for Malaysian novice drivers to learn about traffic rules and regulation. This involves developing and integrating various media to produce the multimedia system to overcome some limitations observed in current text and image-based textbook. This study is targeted at Malaysian novice drivers aged from 17 years old and above who wanted to obtain their driving license. The content scope of this study is taken from two sub-topic in “Kurikulum Pendidikan Pemandu” textbook which are “Olahgerak” and “Peraturan di Pelbagai Persimpangan”. Multimedia is used to design and develop the system, which involve incorporating audio, graphics, videos and text to represent the selected contents from KPP text book. The overall system can also be presented on the web.

Penyediaan sistem pembelajaran multimedia ini adalah berdasarkan dua sub-topik dalam buku teks “Kurikulum Pendidikan Pemandu” iaitu “Olahgerak” dan “Peraturan di Pelbagai Persimpangan”. Multimedia digunakan untuk menghasilkan sistem, yang melibatkan audio, grafik, video dan teks untuk mewakili kandungan terpilih dari buku teks KPP. Sistem secara keseluruhannya juga dipersembahkan dalam format web.

ABSTRAK

SISTEM PEMBELAJARAN MULTIMEDIA UNTUK PEMANDU NOVIS MALAYSIA

Esther Foo Hui Hui

INTRODUCTION

Kajian ini bertujuan untuk mencipta sistem pembelajaran multimedia untuk pemandu baru Malaysia untuk belajar tentang peraturan lalu lintas. Aktiviti mencipta sistem multimedia termasuk merancang sistem pembelajaran yang membolehkan pelajar untuk belajar tentang peraturan lalu lintas serta mengembangkan dan mengintegrasikan pelbagai media untuk menghasilkan sistem multimedia untuk mengatasi keterbatasan dalam buku teks yang berasaskan gambar dan perkataan. Sistem dibina untuk pemandu baru di negara Malaysia yang berusia 17 tahun ke atas dan berkeinginan untuk mendapatkan lesen memandu mereka. Kandungan dalam kajian ini adalah berdasarkan dua sub-topik dalam buku tek "Kurikulum Pendidikan Pemandu" iaitu "Olahgerak" dan "Peraturan Pelbagai Di Persimpangan". Integrasi audio, grafik, video dan teks telah digunakan untuk membina sistem multimedia ini. Sistem secara keseluruhannya juga dipersembahkan dalam laman web.

"Kurikulum Pendidikan Pemandu" (KPP) is one of the efforts done by the government to instill good attitude and skills to new drivers in our country (JPJ, 2006). This book contains rules and regulations needed to be known by every road user.

1.1 Statement of the Problem

Rules and regulations in KPP text book are mostly presented in text and images. Text is used to describe and convey a certain scenario and to explain traffic rules and regulations. However, using text can be a constraint to those that have low language proficiency. They may face a hard time to understand the meaning of the content. Furthermore, using text to describe a certain road scenario is hard to represent the higher level of abstraction such as the dynamic of the vehicles (Brown, Haggard, Deurts, Cornelissen, Hardman, & Rutledge, 2000).

1.0 Background of the Study

Road accidents have been increasing in Malaysia. According to the Transport Ministry of Malaysia (2008), the number of road accidents has increased from 10,598,804 cases in year 2000 to 16,812,440 cases in the year 2007. Furthermore, the number of drivers involved in road accident has increased from 7,956,414 in the year 2000 to 11,836,136 in year 2007, and these drivers include motorcyclist, car drivers, pillion riders, pedestrians and bicycle riders. According to Bedi (2007), teenagers and young adults are the most reckless group of road user (Bedi, 2007). The highest rate of road accidents happen among those that aged from 16 to 25 years old and followed by 26 to 35 years old road user. Together they make up 58.5% of deaths on the road or 10,947 from a total of 18,715 deaths from the year of 2004 to 2006 according to the Royal Malaysian Police (Bedi, 2007).

Hence, efforts to educate the nation on road safety have been conducted by government agencies in our country (JPJ, 2006). Introducing the text book called

“Kurikulum Pendidikan Pemandu” (KPP) is one of the efforts done by the government to build good attitude and skills to new drivers in our country (JPJ, 2006). This book contains rules and regulations needed to be known by every road user.

1.1 Statement of the Problem

Rules and regulations in KPP text book are mostly presented in text and images. Text is used to describe and convey a certain scenario and to explain traffic rules and regulations. However, using text can be a constraint to those that have low language proficiency. They may face a hard time to understand the meaning in the context. Furthermore, using text to describe a certain road scenario is hard to express the higher level of abstraction such as the dynamic of the vehicles (Oseenbruggen, Geurts, Cornelissen, Hardman, & Rutledge, 2000).

Image is a two dimensional mental representation, which can refer to picture or photo. Images are used to show traffic signs and two dimensional plan view of road scenario in KPP text book. However, using images to represent the whole scenario does not mimic the real-world situation, and images could be a constraint to those that have low spatial ability to imagine and understand the meaning being presented (Oseenbruggen, Geurts, Cornelissen, Hardman, & Rutledge, 2000).

1.2 Objective

The objective of this study is to create a multimedia learning system for Malaysian novice drivers to learn about traffic rules.

1.2.1 Specific Objective

- I. To design a multimedia learning system to enable learners to learn about traffic rules.
- II. To develop and integrate various media to produce the multimedia learning system.

1.3 Importance of the Study

The importance of this study is to present the contents in KPP text book using multimedia, to overcome some of the limitations observed in current text and image-based textbook.

1.4 Scope

This study is targeted on people who wanted to obtain their driving license in Malaysia, because before obtaining driving license students have to go through theory test. The earliest age to obtain a driving license is 17 years old, and there are also users from 18 years old and above who wanted to get their driving license. Hence, those people who are 17 years old and above, and who wanted to obtain their driving license is the targeted group of learners for the intended multimedia learning system.

The scope of content will only cover two sub-topics from KPP text book, which are "Olahgerak", and "Peraturan di Pelbagai Persimpangan".

3.1 The use of Multimedia for Training and Educating Novice Drivers

3.1.1 In New Zealand

Computer-based interactive multimedia training CD-ROM is developed for novice drivers in New Zealand. Learning environment is developed to allow driver to practice skills such as eye scanning, hazard detection and risk management through various scenarios.

CHAPTER 2

LITERATURE REVIEW

Various are widely used to allow novice drivers to learn driving in real traffic situation, where all these scenarios are first to understand through explanation in text (Isler & Cockerton, 2003). Furthermore, the use of videos also allow novice driver to be exposed in safe conditions, and at the same time they can observe the real driving situation which usually happen on the road. Feedback from them can be made by reacting and responding to the situation as if they are in the real driving world.

2.0 Multimedia

According to Mayer (2003), multimedia presents materials using both pictures and words. Presentations by words mean to present the materials in printed or spoken text (Mayer, 2003). However, presentation by pictures mean to present material in pictorial form, such as using static graphics, which includes illustrations, graphs, photos, maps, or using dynamic graphics which include animation and video (Mayer, 2003). Usually words are presented on-screen text or as narration, and pictures can be presented as graphics such as animation, or video. Normally, printed text, and static pictures are used as illustration in text book (Mayer, 2003). In general, multimedia messages can be described in terms of delivery media (e.g., amplified speaker, and computer screen), presentation mode (e.g., words, and pictures), or sensory modalities (e.g., auditory, visual) (Mayer, 2003).

2.1 The use of Multimedia for Training and Educating Novice Drivers

2.1.1 In New Zealand

Computer-based interactive multimedia training CD-ROM is developed for novice drivers in New Zealand. Learning environment is developed to allow driver to practise skills such as eye scanning, hazard detection and risk management through videos and simulations. Videos are widely used to allow novice drivers to learn through real traffic situation, where all these scenarios are hard to understand through explanation in text (Isler & Cockerton, 2003). Furthermore, the use of videos also allow novice driver to be exposed in safe condition, and at the same time they can observe the real driving situation which usually happen on the road. Feedback from them can be made by reacting and responding to the situation as if they are in the real driving world.



Figure2.1: Video screenshot of CD-DRIVES (Isler & Cockerton, 2003)

Figure 2.1 shows the training module for eye scanning of real road situation using both video and animation. Some videos are included, and user is required to scan all views including the three dimensional dashboard, rear mirror,

and side view mirrors. After the video showing some road scenarios, the video will stop a while and user is required to respond to a multiple-choice question regarding the specific event they have just seen.

2.1.2 In Europe

European country utilized e-learning applications as training and learning tools for novice drivers. This is to move learning process from classroom teaching and text books reading into learners' world (Troglauer, 2005). According to Troglauer (2005), driving curriculum should cover all areas in the framework and address the appropriate associated driving behaviour. However, they concluded that existing driver training typically only addresses vehicle manoeuvring and mastery of traffic situations, whereas self-evaluation which deals with how the driver is capable of assessing themselves, pointing to self-adjustment of everything from skills in vehicle handling to reflection of individual risk attitudes are simply omitted from driving training (Troglauer, 2005). The existing driving schemes do not provide the learning driver with sufficient strategies for safe driving, particularly in the area of higher order skills (Troglauer, 2005). Typically learning approach to learn content was through reading book then they will be tested in content of the curriculum (Troglauer, 2005). However, Europe GDE-framework (Goals for Driver Education) applied e-learning applications for driver training. Within the domain of driver training with e-learning has denoted various kinds of techniques using multimedia to enhance traffic safety through improvement of driver's skills and knowledge. According to Troglauer (2005), use of multimedia offer learning advantages such as learning process in instructional method where learning material can be organized and structured, and allows mutual interaction between the learner and the system. Multimedia also allows learner to set learning pace, where possible adjustment of content to learner preferences can be made, and at the same time information can be presented in various sources such as audio-visual and illustrative examples

(Troglauer, 2005). This may allow information presented to be more simulative than material presented in text (Troglauer, 2005).

In Europe, multimedia is used for increasing learners' awareness of possible risk factors such as reacting to other road-users, lane changing, and to show effects of taking alcohol. Combination of text, audio and video are used to show simple illustration to dynamic scenarios. In the traditional test, possible feedback on answer is presented in either right or wrong. However, e-learning system allows feedbacks to be presented in animation and illustration of the outcome of learner choice of answer which helps the learner to see the consequences if wrong answer is chosen.

2.1.3 In the United State of America

PC-based Risk Awareness and Perception Training Program (RAPT) is developed to educate novice drivers about different categories of risky situation which they may face while driving on the road in USA (Pradhan, Fisher, & Pollatsek, 2005). This programme is an interactive multimedia presentation of risky scenarios which display both plan views and perspective views of the roadway with information on the types of risks and the relevant areas that driver should allocate their attention to detect the risks. This research was run with a set of novice drivers where these drivers are trained with the programme. The programme provides ten risky scenarios which are categorised with a few obstructions such as vehicle that obscured the participant's view of the risk in front, sign ahead (e.g., stop sign ahead which is to warn drivers to stop was obscured), and visible pedestrian and vehicle (e.g., vehicle ahead of the driver might suddenly stop to make turning to left or right to avoid hitting a pedestrian). In some cases, additional actual scenes were displayed to illustrate clearer scenarios.

In the training, participant was instructed to drag both red and yellow ovals over the schematic of scenarios. As showed in Figure 2.2 the red circle was

to be dragged to an area that should be monitored more, and the yellow oval are to be dragged to area that contains vehicle, pedestrian, or sign that might be hidden to the driver but could be of relevance to the driver to travel. As showed in Figure 2.3 video media is also incorporated with simulation to train novice drivers. In addition for each of the scenario, participant will be asked two to three questions regarding the scenario.

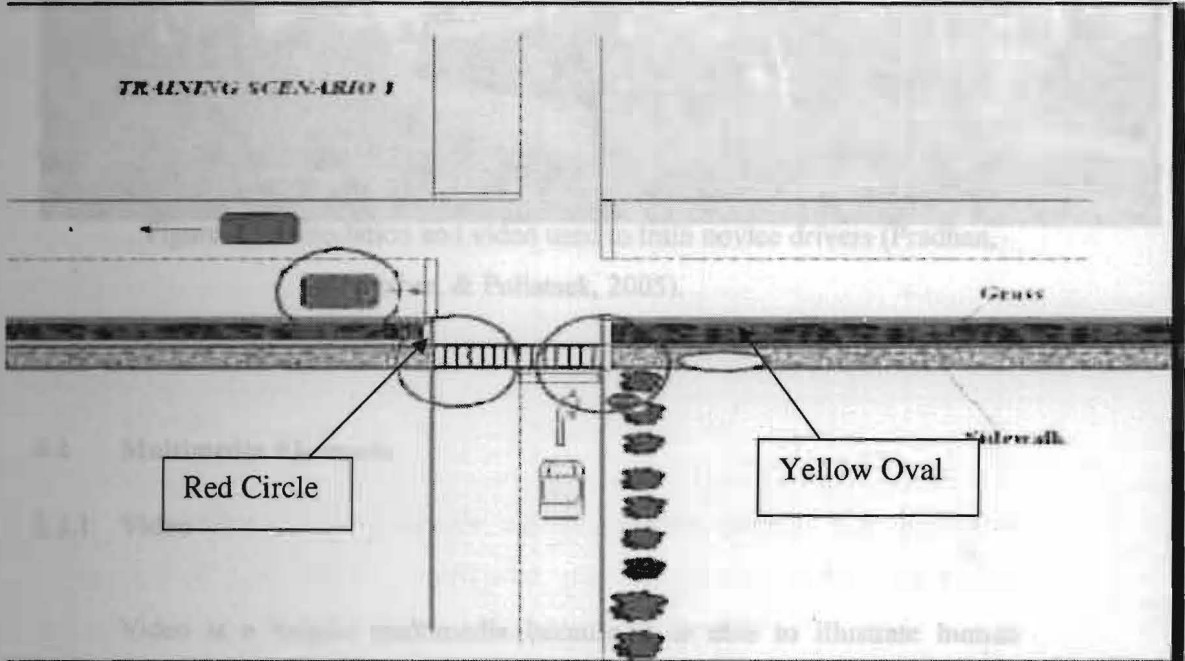


Figure 2.2: Red and Yellow circle drag to the corresponding area by learner (Pradhan, Fisher, & Pollatsek, 2005).

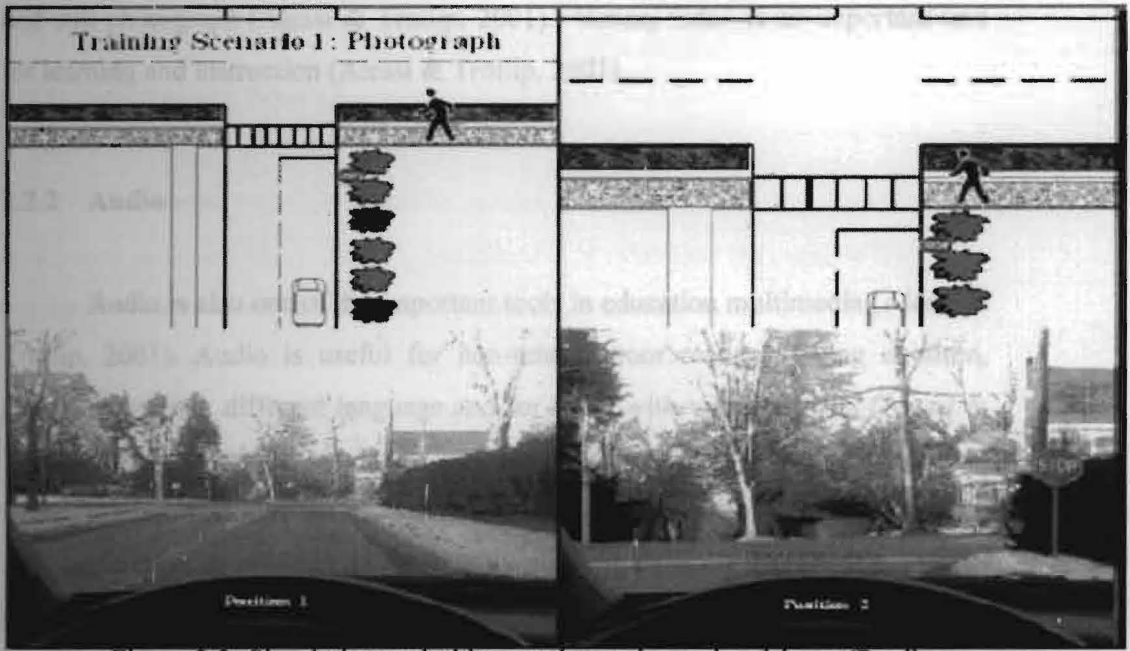


Figure 2.3: Simulation and video used to train novice drivers (Pradhan, Fisher, & Pollatsek, 2005).

2.2 Multimedia Elements

2.2.1 Video

Video is a helpful multimedia because it is able to illustrate human behaviour and interpersonal situation which are difficult to be explained through static text (Alessi & Trollip, 2001). Video is an important component of learning; it can contribute to learner understanding of certain concept (Escalada, 2004). Demonstration showed through video allows learner to see how things behave and capture physical phenomena more effectively (Escalada, 2004). Video can also take in many forms such as soundless demonstration of a procedure, a person speaking, comedic, dramatic plays, and so on (Alessi & Trollip, 2001). Usually data displayed through video may fall in multiple formats such as images, voice, animation, and music that enables people with various learning styles to understand the meaning presented (Dede, 1996). Furthermore it is hard for a learner to understand human body language on communication through graphics

and still photograph (Alessi & Trollip, 2001). Hence, video is an important tool for learning and instruction (Alessi & Trollip, 2001).

2.2.2 Audio

Audio is also one of the important tools in education multimedia (Alessi & Trollip, 2001). Audio is useful for non-reader, poor readers, young children, people who speak different language and for those with visual impairs (Alessi & Trollip, 2001). Normally, audio is included together with video as background sound, music, or to give instruction, and speech (Barbara, Koenecke, & Joaquin, 2001). However to produce a high quality audio is difficult. Hence, it is best to use professional narrator when audio is included to give explanation. Speech recorded has to be acoustic, and having consistent volume (Alessi & Trollip, 2001).

2.2.3 Graphic

Multimedia makes extensive use of pictures, graphs, and illustration (Alessi & Trollip, 2001). If it is well used, graphics can enhance learning (Alessi & Trollip, 2001). Visual graphics are some of the popular tools used in on-line learning text (Tim & Gilman, 2008). Graphics can be used to represent important information and are used to support text (Tim & Gilman, 2008). However, the use of graphics has to match the objective of the content presented to avoid confusion (Alessi & Trollip, 2001).

2.3 Mayer's Multimedia Principle

2.3.1 Multimedia Principle

Multimedia principle refers to multimedia presentation that contains both words and pictures (Mayer, 2003). Multimedia presentation encourages learner to engage in active learning by mentally making connection between the pictorial and verbal representations (Mayer, 2003). There are some e-learning environments that contain pages of texts and some decoration besides the text but this does not help us to understand the text. According to multimedia principle, instead of presenting text alone, content should include pictures to help learner to understand the contents. But this can only work if the graphics are relevant to the text.

2.3.2 Contiguity Principle

Contiguity principle refers to placing printed words near corresponding graphics (Mayer, 2003). Words are placed near the part of on-screen graphics to which they refer to. For instance, when the on-screen graphic is a diagram showing a part of an object, the printed word of that part should include name or text near to the corresponding diagram using a pointing line to connect both the name and diagram. This is the same, when the text describes an action or a state represented in an illustration, the text can appear as a small pop-up message when the mouse cursor is placed on the corresponding graphic (Mayer, 2003). This is called the rollover or mouse-over technique (Mayer, 2003). The other example is when learner places their cursor on different part of the tool bar; a small text will appear to explain the tool function. This can usually be seen in Microsoft word tools bar.

2.3.3 Modality Principle

Modality principle refers to presenting words as speech rather than on-screen text when it is feasible (Mayer, 2003). Typically, learner may experience an overload of their visual channel when they must process both graphics and texts simultaneously (Mayer, 2003). For instance, when their eyes must attend to the printed text, they may not fully pay attention to the graphics or animation at the same time especially when words and graphics are to be presented concurrently at rapid pace.

2.3.4 Redundancy Principle

Describing graphics using both words on-screen and audio narration in which audio repeats the written text is called redundant on screen. According to Clark and Mayer (2003), graphics that are explained by audio alone, rather than graphics that are explained by audio as well as on-screen text provides better learning results. This is to avoid the overloading of the visual channel of the working memory. Based on the research in cognitive psychology, multimedia designers has to avoid using redundant on-screen text presented at the same time as graphics when planning of multimedia consisting of graphics such as animation, video, or statics pictures (Clark & Mayer, 2003). This is because, learner may not look at the graphics if their eyes are paying attention to the on-screen texts.

2.3.5 Coherence Principle

Based on this principle, additional interesting material added may hurt learning (Clark & Mayer, 2003). Inclusion of extra interesting materials such as entertaining stories, background music, and detailed textual descriptions which may harm learning process ought to be excluded. Adding additional information may cause (Clark & Mayer, 2003):

- I. Distraction: This leads learner's attention away from the relevant material towards irrelevant material.
- II. Disruption: Stop learner from building appropriate links among relevant material due to the disruption of irrelevant material.
- III. Seduction: Priming inappropriate existing knowledge that is used for organising the incoming material. For example, adding irrelevant materials to spice up the presentation.

2.3.5.1 Coherence Principle: Avoid Extraneous Sound

According to Clark and Mayer (2003), background music or environmental sounds are the example of extraneous sound. Background music and sounds may overload working memory where learner may experience heavy cognitive load, especially when unfamiliar material is to be presented to them, or when material is presented in rapid rate, or presentation is not under their control (Clark & Mayer, 2003). For instance, in a lesson to illustrate the different types of ammunitions a worker may encounter, background sounds such as bullet flying, bombs exploring, and tank firing are likely to cause distraction.

2.3.5.2 Coherence Principle: Avoid Extraneous Pictures

Extraneous pictures either in graphics form such as animation and video or static pictures may distract and disrupt learning process (Clark & Mayer, 2003). This is because extraneous pictures may interfere with learner's attempts to make sense of the material presented (Clark & Mayer, 2003). Based on the cognitive theory of multimedia learning, learner seeks to make sense of the material presented (Clark & Mayer, 2003). If the learner successfully builds a coherent mental representation of the material, they may find that it is enjoyable. However, it might not be the same case when adding extraneous pictures that interferes with the process of sense-making (Clark & Mayer, 2003).