

DESIGN AND DEVELOPMENT OF CORPORATE
GAMIFICATION IN TRAINING FRAMEWORK FOR
SUSTAINED ENGAGEMENT IN MALAYSIAN CUSTOMER
SERVICE INDUSTRIES

TAN CHEE BEN

A Thesis Submitted to Asia e University in
Fulfilment of the Requirements for the
Degree of Doctor of Philosophy

August 2019

ABSTRACT

The purpose of this research was to propose a guideline under a gamification framework for corporate training that would help instructional designers or corporate trainers to improve instructional designs through a systematic approach when gamifying a training programme.

The traditional methods used in corporate sector training were not engaging and interactive, as well as ineffective. Hence, gamification methods are used in the corporate world to improve training. Effective gamification could bring in savings and profit returns, resulting in the use of gamification in many businesses. However, there were no clear guidelines for effective gamification design. This study investigated the usage of a design-based research (DBR) approach on gamification in corporate training.

This research used a mixed method research design for data collection and analysis. For the training design in this research, the DBR approach was used to ensure the successful implementation of a gamification framework for corporate training. Methodological triangulation was conducted to enhance reliability and validity through cross-checking data from multiple sources such as interviews, surveys and observations. Authorisation from the corporate company researched was obtained to avoid any ethical breach. The training was implemented in a real-world setting, hence, the data gathered was based on a real training implementation. A total of 702 participants from the corporate sector were involved in the training. There were eight trainers or practitioners of this programme and they were evaluated by a classroom

auditor or observer. Three pilot classes were conducted with 62 participants. The remaining 640 participants were divided into 31 classes.

The Gamification Training Solutions Framework (GTSF) was a guideline proposed for instructional designers to include games as an important factor in designing instruction. Based on this study, 98% of 640 participants agreed that the overall course was effective. Feedback from participants showed that 97% agreed that the GTSF used had effective course content and design. Ninety-seven percent (97%) of the 640 participants recommended the course to others. In conclusion, future corporate training could use the GTSF as a quick guideline for instructional designers to implement training using gamification.

APPROVAL PAGE

I certify that I have supervised /read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, as a thesis for the fulfilment of the requirements for the degree of Doctor of Philosophy.

Dr Rafiza Binti Abdul Razak
Senior Lecturer, Curriculum and Instructional Technology
Universiti Malaya
Supervisor

Examination Committee:

Assoc Prof Dr Tan Wee Hoe
Education Research Laboratory
Universiti Pendidikan Sultan Idris
Examiner

Prof Dr Maizam Binti Alias
Faculty of Technical and Vocational Education
Universiti Tun Hussein Onn Malaysia
Examiner

Dr Yusup Bin Hashim
Adjunct Professor
Asia e University
Examiner

Prof Dr Siow Heng Loke
Dean, School of Graduate Studies
Asia e University
Chairman, Examination Committee

This thesis is submitted to Asia e University and is accepted as fulfilment of the requirements for the degree of Doctor of Philosophy.

Prof Dr John Arul Phillips
Dean, School of Education
Asia e University

Prof Dr Siow Heng Loke
Dean, School of Graduate Studies
Asia e University

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

Name of Candidate: TAN CHEE BEN

Signature of Candidate:

Date: 30th August 2019

Copyright by Asia e University

ACKNOWLEDGEMENTS

Firstly, I would like to thank my supervisor Dr. Rafiza binti Abdul Razak for the continuous support of my Ph.D study and related research. Her guidance helped me to start my research, challenged my thinking skills and motivated me to complete my research.

Besides my supervisor, I would like to thank the rest of my thesis committee: Prof. Dr. Siow Heng Loke, and the other committee members for their insightful comments, encouragements, and also for the challenging questions asked which led me to view my research from various perspectives.

I also would like to thank everyone else who contributed directly or indirectly to this research. I really appreciate the company that allowed me to conduct my research in and providing me the study opportunity. Fellow learners and practitioners in the field who shared new insights to my field of studies, I am truly grateful and thankful for the knowledge gained from them from both discussions and writings.

Lastly and most importantly, I would like to thank my family: my parents, family members and especially my beloved wife for providing moral support and inspiration to me throughout the period of writing this thesis and my life.

TABLE OF CONTENTS

ABSTRACT	ii
APPROVAL PAGE	iii
DECLARATION	iv
ACKNOWLEDGEMENTS	vi
LIST OF TABLES	xii
LIST OF FIGURES	xviii
LIST OF ABBREVIATIONS	xxiii
CHAPTER 1: INTRODUCTION	24
1.1 Introduction.....	24
1.2 Rationale for the Study	29
1.3 Background of the Research	31
1.4 Problem Statement.....	37
1.5 Research Objectives.....	46
1.6 Research Questions.....	47
1.7 Conceptual Framework.....	48
1.8 Research Significance.....	60
1.9 Scope and Limitation	63
1.10 Summary	66
1.11 Operational Definitions of Terms	69
CHAPTER 2: LITERATURE REVIEW	73
2.1 Introduction.....	73
2.2 Malaysian Interest in Gamification	81
2.3 Study of Game Theory.....	84
2.4 Types of Game Theory	88
2.5 Reviews of Quantitative and Qualitative Implementations of Gamification Studies	91
2.6 Gamification	96
2.7 Issues in Gamification	97
2.8 Corporate Training and Education.....	98

2.9	Summary	112
CHAPTER 3: METHODOLOGY		115
3.1	Introduction.....	115
3.2	Design-based Research (DBR)	117
3.3	Research Design Model	120
3.4	Gamification Training Solutions – Complete Framework	127
3.5	Data Collection (Mixed Method).....	130
3.5.1	GTSF Analysis (Phase 1) and Design (Phase 2)	130
3.5.1.1	Questionnaire(s).....	130
3.5.1.2	Procedures.....	130
3.5.1.3	Instruments	130
3.5.1.4	Participants	136
3.5.2	GTSF Validation (Phase 3) and Development (Phase 4)	138
3.5.2.1	Questionnaire(s).....	138
3.5.2.2	Procedures.....	138
3.5.2.3	Instruments	138
3.5.2.4	Participants	142
3.5.3	Refinement (Phase 5).....	142
3.5.3.1	Questionnaire(s).....	142
3.5.3.2	Procedures.....	142
3.5.3.3	Instruments	142
3.5.3.3.1	Interviews of the trainers running the Pilot Training.....	145
3.5.3.4	Participants	146
3.5.4	GTSF Implementation (Phase 6) and Evaluation (Phase 7)	147
3.5.4.1	Questionnaire(s).....	147
3.5.4.2	Procedures.....	147
3.5.4.3	Instruments	147
3.5.4.4	Participants	149
3.6	Data Analysis	151
3.6.1	Analysis and Design Phases – Interviews	151
3.6.2	Analysis and Design Phases – Context Analysis.....	151
3.6.3	Analysis and Design Phases – GTSF Survey	151
3.6.4	Validation and Development Phases – User Acceptance Test (UAT)	152

3.6.5	Validation and Development Phases – GTSF Validation Checklist	152
3.6.6	Refinement, Implementation and Evaluation Phase – Demography Information	153
3.6.7	Refinement – Pilot Training (Batch 1 – 3)	153
3.6.8	Refinement – Pilot Trainers Feedback Findings	154
3.6.9	Implementation – Training (Batch 4 – 34)	154
3.6.10	Implementation– Training Assessment	154
3.7	Company Selection	155
3.8	Triangulation Method	156
3.9	Missing Data	157
3.10	Ethical Considerations	157
3.11	Validity	158
3.12	Reliability	160
3.13	Limitations	163
3.14	Summary	163
CHAPTER 4: RESULTS AND FINDINGS.....		165
4.1	Gamification Training Solutions Framework (GTSF) Participants...	165
4.2	Research Objective One (1): Identify needs in designing a GTSF Programme and Research Objective Two (2): Design a GTSF Programme.....	168
4.2.1	Analysis – Interview of Four Instructional Designers and a Top Management Staff.....	169
4.2.2	Analysis – Interviews of Instructional Designers Findings	170
4.2.3	Analysis – Interview of Top Management Staff Findings.....	173
4.2.4	Analysis – Content Analysis.....	175
4.2.5	Analysis – GTSF Survey Results 2017	175
4.2.5.1	Demography of Participants in the GTSF Survey 2017	176
4.2.6	Findings from the Analysis Phase	191
4.2.7	Findings from the Design Phase	192
4.3	Research Objective Three (3): Validate the GTSF Programme ..	192
4.3.1	Validation – Participants Information	193

4.3.2	Validation – User Acceptance Test (UAT) Results from Practitioners	194
4.3.3	Validation – User Acceptance Test (UAT) Findings	198
4.3.4	Validation – Gamification Training Solutions Framework (GTSF) Validation Checklist Findings	199
4.4	Research Objective Four (4): Refine the GTSF Module	201
4.4.1	Refinement, Implementation and Evaluation – Participants’ Feedback Results 2017	201
4.4.1.1	Refinement, Implementation and Evaluation – Demography of Participants’ Surveyed in Pilot and Implementation Phases	201
4.4.1.2	Refinement – Participants’ 2017 GTSF Pilot Trainings Feedback Results.....	204
4.4.1.3	Refinement – Participants’ Feedback Findings for Pilot Training	224
4.4.1.4	Refinement – Interview of Pilot Trainers Findings	231
4.5	Research Objective Five (5): Evaluate the GTSF programme from the perspective of instructional design and participants (trainees)....	232
4.5.1	Implementation and Evaluation – Participants’ Feedback Results for GTSF Implementation Trainings 2017	232
4.5.2	Implementation and Evaluation – Participants’ Feedback Findings for Implementation Training.....	272
4.5.3	Implementation and Evaluation – Training Assessment Results for Implementation Trainings.....	277
4.5.4	Implementation and Evaluation – Training Assessment Findings for Implementation Trainings	279
4.6	Summary	284
CHAPTER 5: SUMMARY, CONCLUSION AND IMPLICATIONS		286
5.1	Summary of Study	286
5.2	Summary of Findings and Results	291
5.3	Triangulation.....	315
5.4	Discussion.....	317
5.5	Legal and Ethical Issues	321
5.6	Gamification Frameworks	325

5.7	Implications and Future Research.....	331
5.8	Conclusion	333
	REFERENCES	
	338
	Appendix A	364
	Appendix B	369
	Appendix C	374

LIST OF TABLES

	<u>Page (s)</u>
Table 2 – 1. Types of Instructional Design Models – Branch & Gustafson (2002)	79
Table 2 – 2. Type of Application Cases	92
Table 2 – 3. Gamification Design Principles based on Malone & Lepper (1987)’s Theory of Intrinsic Motivation mapped to Gamification Design Mapping (Dicheva, Dichev, Age, & Angelova, 2015)’s Terms	93
Table 2 – 4. Count of Gamification Design Principles Mapped to Malone & Lepper (1987)’s Theory of Intrinsic Motivation from the 53 Gamification Studies Reviewed	94
Table 2 – 5. Evaluation on Gamification Research.....	95
Table 3 – 1. GTSF Training Phases	120
Table 3 – 2. Questions used in the User Acceptance Test (UAT) Form.....	139
Table 3 – 3. The GTSF Validation Checklist.....	141
Table 3 – 4. Sample Research Company’s Participant’s Feedback Form	143
Table 3 – 5. Qualitative Data that could be gathered from the Other Side of the Printed Survey Form (shown in Table 3 – 4).....	145
Table 3 – 6. Questions used to gather data from the Training Assessment Form ..	148
Table 3 – 7. Programme Effectiveness Score (Batch 1 – 3)	161
Table 3 – 8. Summary of Research Objectives, Research Questions, Data Collection Techniques and Expected Participants according to Phases.....	164
Table 4 – 1. Participants Interviewed Information.....	169
Table 4 – 2. Participants Interview Findings – Part 1	170
Table 4 – 3. Participants Interview Findings – Part 2	171
Table 4 – 4. GTSF Survey Gender Distribution Breakdown in Numbers	176
Table 4 – 5. Generation Gap of GTSF Survey Participants Breakdown	177
Table 4 – 6. GTSF Survey Participants’ Job Breakdown	178
Table 4 – 7. Number of GTSF Survey 2017 Participants surveyed from Within (Internal) and Outside (External) the Company.....	179
Table 4 – 8. GTSF Survey 2017 Participants’ Years of Experience in Instructional Design	180
Table 4 – 9. GTSF Survey 2017 Participants’ Years of Experience in Gamification Design	181
Table 4 – 10. GTSF Survey 2017 Participants with Instructional Design Training Response	182
Table 4 – 11. GTSF Survey 2017 Participants Familiarity Level based on Number of Participants.....	183
Table 4 – 12. GTSF Survey 2017 Participants Who Play Computer Games.....	184
Table 4 – 13. GTSF Survey Participants Who Play Sports	185
Table 4 – 14. GTSF Online Survey 2017 Conversion Rating Scale to AHP Score.	186

Table 4 – 15. The Results from the Gamification Training Solutions Framework (GTSF) Online Survey.....	187
Table 4 – 16. UAT and GTSF Validation Checklist Participants Information.....	193
Table 4 – 17. Results from the User Acceptance Test (UAT) – Framework.....	194
Table 4 – 18. The Results from the User Acceptance Test (UAT) – Content	195
Table 4 – 19. The Results from the User Acceptance Test (UAT) – Visual.....	196
Table 4 – 20. The Results from the User Acceptance Test (UAT) – Assessment ...	197
Table 4 – 21. The Results from the User Acceptance Test (UAT) – Overall.....	197
Table 4 – 22. The Qualitative Findings from the User Acceptance Test (UAT).....	198
Table 4 – 23. The Findings from the GTSF Validation Checklist – Part 1.....	199
Table 4 – 24. The Findings from the GTSF Validation Checklist – Part 2.....	200
Table 4 – 25. GTSF Participants’ Gender Distribution Breakdown in Pilot and Implementation	201
Table 4 – 26. Generation Gap of Participants in Pilot and Implementation Breakdown	202
Table 4 – 27. Participants Job Positions for Pilot and Implementation Phases in Details	203
Table 4 – 28. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 1 on Concepts and Contents Familiarity before Training.....	204
Table 4 – 29. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 2 on Concepts and Contents Familiarity after Training.....	205
Table 4 – 30. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 3 on Course Content Logically Organised	206
Table 4 – 31. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 4 on Course Materials Reading Easiness.....	207
Table 4 – 32. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 5 on Course Objectives Met	208
Table 4 – 33. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 6 on Concepts or Skills Presented Useful	209
Table 4 – 34. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 7 on Appropriate Use of Exercise and Activities	210
Table 4 – 35. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 8 on Easy Programme Flow	211
Table 4 – 36. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 9 on Facilities were Conducive for Learning and Enough Notice was Given on the Training.....	212

Table 4 – 37. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 10 on Facilitator or Trainer Prepared and Organised	214
Table 4 – 38. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 11 on Facilitator or Trainer Competent in the Subject Matter	215
Table 4 – 39. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 12 on Facilitator or Trainer Used Relevant Job Examples.....	216
Table 4 – 40. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 13 on Trainer Able to Encourage and Stimulate Interest	217
Table 4 – 41. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 14 on Trainer Able to Communicate Ideas and Concept Clearly	218
Table 4 – 42. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 15 on Trainer Able to Receive and Reply Questions and Comments	219
Table 4 – 43. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 16 on Trainer Able to Provide Good Feedback	220
Table 4 – 44. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 17 on Facilitator or Trainer was Overall Effective.....	221
Table 4 – 45. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 18 on Overall Course Success and Personal Objective Met	222
Table 4 – 46. Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 19 on Course Recommendation to Others.....	223
Table 4 – 47. Participants’ Feedback Findings – Pilot Training based on Theme – Features / Topics the Participants Like Best.....	224
Table 4 – 48. Participants’ Feedback Findings – Pilot Training Summary based on Theme – Features / Topics the Participants Like Best.....	225
Table 4 – 49. Participants’ Feedback Findings – Pilot Training based on Theme – Need Improvement	226
Table 4 – 50. Participants’ Feedback Findings – Pilot Training Summary based on Theme – Need Improvement	226
Table 4 – 51. Participants’ Feedback Findings – Pilot Training based on Theme – Features / Topics Exclusion	227
Table 4 – 52. Participants’ Feedback Findings – Pilot Training Summary based on Theme – Features / Topics Exclusion.....	227

Table 4 – 53. Participants’ Feedback Findings – Pilot Training based on Theme – Constructive Feedback.....	228
Table 4 – 54. Participants’ Feedback Findings – Pilot Training Summary based on Theme – Constructive Feedback.....	228
Table 4 – 55. Participants’ Feedback Findings – Pilot Training based on Theme – Other Feedback	229
Table 4 – 56. Participants’ Feedback Findings – Pilot Training Summary based on Theme – Other Feedback	230
Table 4 – 57. Pilot Trainers Information.....	231
Table 4 – 58. Pilot Trainers Feedback Findings	231
Table 4 – 59. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback Summary for Question 1 on Concepts and Contents Familiarity before Training	232
Table 4 – 60. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 2 on Concepts and Contents Familiarity after Training.....	235
Table 4 – 61. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 3 on Course Content Logically Organised	237
Table 4 – 62. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 4 on Course Materials Reading Easiness.....	239
Table 4 – 63. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 5 on Course Objectives Met.....	241
Table 4 – 64. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 6 on Concepts or Skills Presented Useful.....	243
Table 4 – 65. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 7 on Appropriate Use of Exercise and Activities	245
Table 4 – 66. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 8 on Easy Programme Flow	247
Table 4 – 67. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 9 on Facilities were Conducive for Learning and Enough Notice was Given on the Training	249
Table 4 – 68. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 10 on Facilitator or Trainer Prepared and Organised	251
Table 4 – 69. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 11 on Facilitator or Trainer Competent in the Subject Matter	253

Table 4 – 70. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 12 on Facilitator or Trainer Used Relevant Job Examples	255
Table 4 – 71. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 13 on Trainer Able to Encourage and Stimulate Interest	257
Table 4 – 72. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 14 on Trainer Able to Communicate Ideas and Concept Clearly.....	259
Table 4 – 73. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 15 on Trainer Able to Receive and Reply Questions and Comments.....	262
Table 4 – 74. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 16 on Trainer Able to Provide Good Feedback	264
Table 4 – 75. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 17 on Facilitator or Trainer was Overall Effective.....	266
Table 4 – 76. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 18 on Overall Course Success and Personal Objective Met.....	268
Table 4 – 77. Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 19 on Course Recommendation to Others.....	270
Table 4 – 78. Participants’ Feedback Findings – Implementation Training Summary based on Theme – Features / Topics the Participants Like Best	272
Table 4 – 79. Participants’ Feedback Findings – Implementation Training Summary based on Theme – Need Improvement	273
Table 4 – 80. Participants’ Feedback Findings – Implementation Training Summary based on Theme – Features / Topics Exclusion.....	274
Table 4 – 81. Participants’ Feedback Findings – Implementation Training Summary based on Theme – Constructive Feedback	275
Table 4 – 82. Participants’ Feedback Findings – Implementation Training Summary based on Theme – Other Feedback.....	276
Table 4 – 83. Training Assessment Results – Implementation Training Summary for Training Delivery.....	277
Table 4 – 84. Training Assessment Results – Implementation Training Summary for Training Techniques	277
Table 4 – 85. Training Assessment Results – Implementation Training Summary for Classroom Management	278

	<u>Page (s)</u>
Table 4 – 86. Training Assessment Findings – Implementation Training for Training Delivery	279
Table 4 – 87. Training Assessment Findings – Implementation Training for Training Delivery Summary	280
Table 4 – 88. Training Assessment Findings – Implementation Training for Training Techniques	280
Table 4 – 89. Training Assessment Findings – Implementation Training for Training Techniques Summary	281
Table 4 – 90. Training Assessment Findings – Implementation Training for Classroom Management	281
Table 4 – 91. Training Assessment Findings – Implementation Training for Classroom Management Summary	281
Table 4 – 92. Training Assessment Findings – Implementation Training for Trainer Strengths	282
Table 4 – 93. Training Assessment Findings – Implementation Training for Trainer Key Areas of Development.....	283
Table 5 – 1. Participants’ Feedback Results Summary for Pilot Batches 1 – 3.....	294
Table 5 – 2. Participants’ Feedback Results Summary for Implementation Batches 4 – 34	304
Table A – 1. EBSCOhost and ProQuest Education Journals database searches.....	364
Table B – 1. GTSF Questionnaires and Types of Data Collected	369
Table C – 1. Participants’ Feedback Findings – Implementation Training based on Theme – Features / Topics the Participants Like Best	374
Table C – 2. Participants’ Feedback Findings – Implementation Training based on Theme – Need Improvement.....	382
Table C – 3. Participants’ Feedback Findings – Implementation Training based on Theme – Features / Topics Exclusion	389
Table C – 4. Participants’ Feedback Findings – Implementation Training based on Theme – Constructive Feedback.....	392
Table C – 5. Participants’ Feedback Findings – Implementation Training based on Theme – Other Feedback	394
Table Appendix D – 1. List of Instructional Design Models by the Instructional Design Organisation (2018)	405
Table D – 2. Other Random Instructional Design Models from Literature Review	428

LIST OF FIGURES

	<u>Page (s)</u>
Figure 1 – 1. Gamification Conceptual Framework.....	48
Figure 2 – 1. Gamification Type of Application in Percentage	92
Figure 2 – 2. Result of Gamification Design Principles Mapped to Malone and Lepper (1987)'s Theory of Intrinsic Motivation	94
Figure 2 – 3. Gamification Evaluation or Reviews.....	95
Figure 3 – 1. Adaptation of the Design-Based Research to Gamification Training Solutions Framework (GTSF) based on Reeves (2000)	125
Figure 3 – 2. Gamification Training Solutions – Complete Framework	127
Figure 3 – 3. Typeform Online Survey Development Interface	134
Figure 3 – 4. GTSF Survey Rating to AHP Score for Part Four Questionnaires....	134
Figure 3 – 5. Information shown in the GTSF survey as GTSF Conceptual Framework.....	135
Figure 3 – 6. Operational Definitions used in the GTSF Survey as information to participants.....	136
Figure 3 – 7. Methodological Triangulation used for this research	156
Figure 4 – 1. Chart showing Gender Distribution of Participants.....	176
Figure 4 – 2. Graph showing Participants Generation Range	177
Figure 4 – 3. Chart showing Participants' Job Distribution.....	178
Figure 4 – 4. Chart showing Participants Surveyed Within and Outside the Company	179
Figure 4 – 5. Graph showing Participants Experience in Instructional Design	180
Figure 4 – 6. Graph showing Participants Experience in Gamification Design	181
Figure 4 – 7. Chart showing Participants with Instructional Design Training Background.....	182
Figure 4 – 8. Graph showing Participants Familiarity with Instructional Design Concepts 2017	183
Figure 4 – 9. Chart showing Participants Who Play Computer Games	184
Figure 4 – 10. Chart showing Participants Who Play Sports	185
Figure 4 – 11. Goepel (2017)'s Analytic Hierarchy Process (AHP) Summary Output	188
Figure 4 – 12. Calculation Matrix for the AHP Summary Results	189
Figure 4 – 13. Calculation of Consensus based on the Individual Results	189
Figure 4 – 14. Detailed AHP Correlation Output of the Results	190
Figure 4 – 15. Chart showing Gender Distribution of GTSF Participants.....	201
Figure 4 – 16. Graph showing Participants Generation Range in Pilot and Implementation	202
Figure 4 – 17. Graph showing Participants' Job Positions in Pilot and Implementation	203

Figure 4 – 18. Survey Summary Graph of GTSF Pilot Training 2017 –for Question 1 on Concepts and Contents Familiarity before Training.....	204
Figure 4 – 19. Graph Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 2 on Concepts and Contents Familiarity after Training.....	205
Figure 4 – 20. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 3 on Course Content Logically Organised.....	206
Figure 4 – 21. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 4 on Course Materials Reading Easiness.....	207
Figure 4 – 22. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 5 on Course Objectives Met....	208
Figure 4 – 23. Graph 4 – 19 shows Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 6 on Concepts or Skills Presented Useful	209
Figure 4 – 24. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 7 on Appropriate Use of Exercise and Activities	210
Figure 4 – 25. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 8 on Easy Programme Flow	211
Figure 4 – 26. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 9 on Facilities were Conducive for Learning and Enough Notice was Given on the Training	213
Figure 4 – 27. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 10 on Facilitator or Trainer Prepared and Organised.....	214
Figure 4 – 28. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 11 on Facilitator or Trainer Competent in the Subject Matter	215
Figure 4 – 29. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 12 on Facilitator or Trainer Used Relevant Job Examples.....	216
Figure 4 – 30. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 13 on Trainer Able to Encourage and Stimulate Interest	217
Figure 4 – 31. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 14 on Trainer Able to Communicate Ideas and Concept Clearly.....	218

Figure 4 – 32. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 15 on Trainer Able to Receive and Reply Questions and Comments.....	219
Figure 4 – 33. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 16 on Trainer Able to Provide Good Feedback	220
Figure 4 – 34. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 17 on Facilitator or Trainer was Overall Effective.....	221
Figure 4 – 35. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 18 on Overall Course Success and Personal Objective Met.....	222
Figure 4 – 36. Graph showing Survey Summary of GTSF Pilot Trainings 2017 – Participants’ Feedback for Question 19 on Course Recommendation to Others.....	223
Figure 4 – 37. Graph showing Survey Summary of GTSF Implementation Training 2017 – Participants’ Feedback for Question 1 on Concepts and Contents Familiarity before Training	234
Figure 4 – 38. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 2 on Concepts and Contents Familiarity after Training	236
Figure 4 – 39. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 3 on Course Content Logically Organised.....	238
Figure 4 – 40. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 4 on Course Materials Reading Easiness	240
Figure 4 – 41. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 5 on Course Objectives Met.....	242
Figure 4 – 42. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 6 on Concepts or Skills Presented Useful	244
Figure 4 – 43. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 7 on Appropriate Use of Exercise and Activities	246
Figure 4 – 44. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 8 on Easy Programme Flow	248

Figure 4 – 45. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 9 on Facilities were Conducive for Learning and Enough Notice was Given on the Training	250
Figure 4 – 46. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 10 on Facilitator or Trainer Prepared and Organised.....	252
Figure 4 – 47. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 11 on Facilitator or Trainer Competent in the Subject Matter	254
Figure 4 – 48. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 12 on Facilitator or Trainer Used Relevant Job Examples.....	256
Figure 4 – 49. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 13 on Trainer Able to Encourage and Stimulate Interest	258
Figure 4 – 50. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 14 on Trainer Able to Communicate Ideas and Concept Clearly.....	261
Figure 4 – 51. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 15 on Trainer Able to Receive and Reply Questions and Comments	263
Figure 4 – 52. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 16 on Trainer Able to Provide Good Feedback.....	265
Figure 4 – 53. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 17 on Facilitator or Trainer was Overall Effective	267
Figure 4 – 54. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 18 on Overall Course Success and Personal Objective Met	269
Figure 4 – 55. Graph showing Survey Summary of GTSF Implementation Trainings 2017 – Participants’ Feedback for Question 19 on Course Recommendation to Others	271
Figure 4 – 56. Graph showing Training Assessment Results Summary.....	278
Figure 5 – 1. Gamification Conceptual Framework.....	286
Figure 5 – 2. Gamification Training Solutions – Complete Framework	290
Figure 5 – 3. Graph showing Pilot Participants’ Knowledge Before and After Training.....	295

Figure 5 – 4. Graph showing Pilot Course Content and Design Overall Effectiveness	297
Figure 5 – 5. Graph showing Pilot Programme Administration was Helpful for Participants’ Learning.....	298
Figure 5 – 6. Graph showing Pilot Programme Facilitators were Overall Effective	299
Figure 5 – 7. Graph showing Pilot Course was Successful Overall.....	300
Figure 5 – 8. Graph showing Pilot Programme Recommendation	301
Figure 5 – 9. Graph showing Implementation Participants’ Knowledge Before and After Training	305
Figure 5 – 10. Graph showing Implementation Course Content and Design Overall Effectiveness	307
Figure 5 – 11. Graph showing Implementation Programme Administration was Helpful for Participants’ Learning.....	308
Figure 5 – 12. Graph showing Implementation Programme Facilitators were Overall Effective.....	309
Figure 5 – 13. Graph showing Implementation Course was Successful Overall....	310
Figure 5 – 14. Graph showing Implementation Programme Recommendation.....	311
Figure 5 – 15. Graph showing Training Assessment Results Summary.....	313
Figure 5 – 16. Methodological Triangulation used for this Research.....	315
Figure 5 – 17. Checkpoints Provided to Participants to Complete the Mapped Journey.....	318
Figure 5 – 18. Comparison between Werbach & Hunter (2012), Kumar & Herger (2013) and the Gamification Training Solutions Framework.....	327
Figure 5 – 19. Integrative Gamification Framework	333

LIST OF ABBREVIATIONS

	<u>Page (s)</u>
ADDIE: Analysis, Design, Development, Implementation and Evaluation.....	32
CDT: Component Display Theory	76
CQU: Central Queensland University.....	101
DBR: Designed-Based Research	117
EBSCO: Elton B. Stephens Company	91
EPU: Economic Planning Unit	33
GTSF: Gamification Training Solutions Framework	46
HRDF: Human Resource Development Fund.....	33
ICT: Information and Communication Technology	83
ID: Instructional Design.....	73
IPDM: Iowa Professional Development Model.....	79
ISTE: International Society for Technology in Education.....	74
MDA: Mechanics, Dynamics and Aesthetics	328
MDeC: Multimedia Development Corporation	83
OEM: Organizational Elements Model.....	416
PAT: Person-Artifact-Task	38
SAM: Successive Approximation Model	428
SAP: Systems, Applications and Products.....	42
SG: Serious Games	108
UAT: User Acceptance Test	64
UCLA: University of California at Los Angeles	42
VARK: Visual, Aural, Read/Write and Kinesthetic	101
WoW: World of Warcraft (Games).....	108
ZPD: Zone of Proximal Development	48

CHAPTER 1: INTRODUCTION

In this chapter, the usage of a design-based research (DBR) approach on gamification in corporate training was explored, covering the introduction, rationale for this study, the background of this research, problem statement, research objectives, research questions, conceptual framework, research significance, scope and limitation, summary and definition of terms.

DBR is a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation. It is based on collaborations among researchers and practitioners in real-world settings, leading to contextually-sensitive design principles and theories (Wang & Hannafin, 2005).

1.1 Introduction

Three major concerns led to this research. Firstly, there has been a workforce engagement crisis going on globally. Secondly, those who wanted to engage the workforce had challenges in the instructional design. Thirdly, competition in the corporate world is driving the urgent need to explore new ways in engaging people to increase productivity and profit.

Worldwide findings from Gallup (2013) on the State of the Global Workforce showed that 13% of employees were engaged in their jobs, while 63% were not engaged and 24% were actively disengaged. Gallup (2013) also noted that Thailand, Malaysia, Indonesia and Singapore had among the highest proportions of “not engaged”