

## TABLE OF CONTENTS

	Page
<b>ABSTRACT (THAI) .....</b>	I
<b>ABSTRACT (ENGLISH) .....</b>	II
<b>ACKNOWLEDGEMENTS .....</b>	III
<b>TABLE OF CONTENTS .....</b>	V
<b>LIST OF TABLES .....</b>	IX
<b>LIST OF FIGURES .....</b>	X
<b>LIST OF ABBREVIATIONS .....</b>	XI
<b>CHAPTER</b>	
<b>    1 INTRODUCTION.....</b>	1
1.1 Background and Context of the Study .....	1
1.2 Statement of the Problems.....	4
1.3 Rationale of the Study.....	7
1.4 Research Objectives .....	8
1.5 Research Questions .....	8
1.6 Significance of the Study.....	8
1.7 Scope of the Study .....	10
1.8 Operational Definitions of Key Terms.....	10
1.9 Summary.....	12
<b>    2 LITERATURE REVIEW.....</b>	13
2.1 English Speaking Skill .....	13
2.2 The Potential Use of Technology to Improve English Speaking Skill .....	15
2.3 Artificial Intelligence (AI) Chatbots .....	16
2.3.1 Characteristics of AI Chatbots.....	16
2.3.2 Operational Structures of AI Chatbots .....	17
2.3.3 The Difference Between an AI Text Chatbots and an AI Voice Chatbots .	32
2.4 Previous Studies about AI Voice Chatbots in EFL Contexts .....	33
2.5 How Vietnamese Undergraduate EFL Students Learn English Speaking in Traditional Classrooms.....	36
2.5.1 Traditional English Speaking Classrooms in Vietnam.....	37
2.5.2 Difficulties of Vietnamese Undergraduate EFL Students in Achieving English Speaking Skill in the Traditional Classrooms .....	38

## TABLE OF CONTENTS (Continued)

	Page
2.6 Technology-Enhanced Language Learning (TELL) .....	42
2.6.1 The TELL Model.....	42
2.6.2 Learning Theories behind TELL.....	44
2.6.2.1 Behaviorism .....	44
2.6.2.2 Constructivism.....	45
2.6.2.3 Social Constructivism.....	45
2.6.2.4 Connectivism.....	46
2.7 Conceptual Framework for Developing the Lessons .....	48
2.7.1 Pre-Speaking.....	48
2.7.2 While-Speaking .....	49
2.7.3 Post-Speaking.....	49
2.8 Summary .....	49
<b>3 RESEARCH METHODOLOGY .....</b>	<b>51</b>
3.1 Research Context.....	51
3.2 Research Design .....	51
3.3 Participants.....	52
3.4 Instruments .....	54
3.4.1 Research Instruments.....	54
3.4.1.1 The Pre-speaking and post-speaking Tests.....	54
3.4.1.2 The Questionnaire.....	55
3.4.1.3 The Semi-Structured Interview.....	57
3.4.2 Instructional Instruments .....	58
3.4.2.1 The AI Voice Chatbot.....	58
3.4.2.2 The Learning Website for The Experimental Group.....	59
3.4.2.3 The Speaking Rubric.....	60
3.4.2.4 The Lesson Plans.....	61
3.4.2.4.1 The Lesson Plan for the Control Group.....	61
3.4.2.4.2 The Lesson Plans for The Experimental Group .....	62
3.5 Data Collection Procedure.....	64
3.5.1 Quantitative Data Collection .....	64
3.5.2 Qualitative Data Collection.....	67
3.6 Data Analysis.....	67
3.6.1 Quantitative Data Analysis .....	68

## TABLE OF CONTENTS (Continued)

	Page
3.6.2 Qualitative Data Analysis.....	68
3.7 Trustworthiness and Validity .....	69
3.7.1 Trustworthiness .....	69
3.7.2 Validity .....	70
3.8 Pilot Study.....	70
3.8.1 General Process.....	71
3.8.2 Specific Process.....	71
3.8.3 Pilot Results .....	72
3.8.3.1 Quantitative Data Analysis Results.....	72
3.8.3.2 Qualitative Data Analysis Results .....	73
3.8.4 Problems Found .....	75
3.9 Summary .....	76
<b>4 RESULTS AND DISCUSSION.....</b>	<b>77</b>
4.1 Results.....	77
4.1.1 The Effects of an AI Voice Chatbot on English Speaking Skill of Vietnamese Undergraduate EFL Students.....	77
4.1.2 The Students’ Opinions on Using an AI Voice Chatbot .....	79
4.1.2.1 Questionnaire Responses.....	79
4.1.2.2 Semi-Structured Interview Responses.....	81
4.2 Discussion .....	85
4.2.1 The Effects of an AI Voice Chatbot on English Speaking Skill of Vietnamese Undergraduate EFL Students.....	85
4.2.1.1 The Students’ Improvement in Speaking Accuracy and Fluency .....	85
4.2.1.2 The Differences in English Speaking Skill of the Students in the Control Group and in the Experimental Group .....	86
4.2.2 The Students’ Opinions on Using an AI Voice Chatbot .....	87
4.3 Summary .....	89
<b>5 CONCLUSION AND RECOMMENDATIONS .....</b>	<b>90</b>
5.1 Summary of the Major Findings.....	90
5.2 Implications of the Study.....	91
5.2.1 Educational Implications for Students .....	91
5.2.2 Pedagogical Implications .....	91

## TABLE OF CONTENTS (Continued)

	Page
5.2.3 Research Implications .....	92
5.3 Limitations and Recommendations for Future Studies .....	93
5.4 Summary .....	94
REFERENCES .....	95
APPENDICES .....	101
APPENDIX A: THE SPEAKING TEST PACK.....	102
APPENDIX B: THE QUESTIONNAIRE .....	107
APPENDIX C: THE SEMI-STRUCTURED INTERVIEW.....	111
APPENDIX D: EXAMPLES OF LESSON PLANS FOR CONTROL GROUP.....	113
APPENDIX E: EXAMPLES OF LESSON PLANS FOR EXPERIMENTAL GROUP .....	121
APPENDIX F: THE SPEAKING ASSESSMENT RUBRIC .....	132
APPENDIX G: THE CRITERIA FOR ENGLISH SPEAKING EXAMINERS.....	133
APPENDIX H: THE IOC VALUE FOR THE QUESTIONNAIRE ITEMS.....	134
APPENDIX I: THE IOC VALUE FOR THE INTERVIEW QUESTIONS .....	138
APPENDIX J: THE IOC VALUE FOR THE SPEAKING TEST PACK.....	141
APPENDIX K: THE IOC VALUE FOR THE SPEAKING ASSESSMENT RUBRIC.....	146
APPENDIX L: THE RATING SCALE FOR THE LESSON PLANS .....	151
APPENDIX M: THE EXPERTS' EVALUATION ON THE INSTRUMENTS .....	154
APPENDIX N: INSTRUMENTAL EVALUATION RESULTS.....	165
APPENDIX O: THE PILOT STUDY RESULTS .....	169
APPENDIX P: INTERVIEW QUESTIONS FOR THE MAIN STUDY .....	204
APPENDIX Q: THE INFORMED CONSENT FORMS .....	212
CURRICULUM VITAE .....	214

## LIST OF TABLES

Table	Page
2.1. TELL Model .....	43
3.1. The Standard Scale for Evaluating English Proficiency .....	53
3.2. The Interpretation of Points in the Questionnaire Part 2 .....	57
3.3. Summary of Research Instruments and Data Analysis.....	67
4.1. Results of the Paired sample T-tests.....	78
4.2. The Students' Personal Information.....	80
4.3. Students' Opinions on Using the AI Voice Chatbot.....	80
N1. Validity of The Questionnaire Items .....	165
N2. Validity of The Semi-Structured Interview Questions .....	165
N3. Validity of The English Speaking Test Pack .....	166
N4. Validity of The Speaking Assessment Rubric.....	167
N5. Validity of The Lesson Plans .....	168
O1. Changes in The Speaking Test Questions.....	169
O2. The Mean Scores of the Participants in the Speaking Tests in the Pilot Study ...	180
O3. The Result of the Paired Samples T-Test in the Pilot Study .....	181
O4. The Number of Males and Females in the Pilot Study .....	181
O5. The Range of Ages of the Participants in the Pilot Study.....	182
O6. The Majors of the Participants in the Pilot Study .....	182
O7. The Participants' Year of Study in The Pilot Study.....	183
O8. The Participants' English Placement Score in the Pilot Study .....	183
O9. The Participants' Technological Experience in The Pilot Study.....	183
O10. The participants' Responses to Question 7 in the Pilot Study .....	184
O11. The participants' Responses to Question 8 in the Pilot Study .....	184
O12. The participants' Responses to Question 9 in the Pilot Study .....	185
O13. The participants' Responses to Question 10 in the Pilot Study .....	185
O14. The participants' Responses to Question 11 in the Pilot Study .....	186
O15. The Participants' Responses to Interview Question 1 in The Pilot Study.....	187
O16. The Participants' Responses to Interview Question 2 in The Pilot Study.....	189
O17. The Participants' Responses to Interview Question 3 in The Pilot Study.....	191
O18. The Participants' Responses to Interview Question 4 in The Pilot Study.....	194
O19. The Participants' Responses to Interview Question 5 in The Pilot Study.....	196
O20. The Participants' Responses to Interview Question 6 in The Pilot Study.....	199
O21. The Participants' Responses to Interview Question 7 in The Pilot Study.....	201

## LIST OF FIGURES

Figure	Page
2.1 Chatbot System Processes.....	18
2.2 System Architecture .....	20
2.3 The Ontology Model .....	21
2.4 The Reference Framework.....	22
2.5 The eXtensible Markup Language (XML).....	24
2.6 Example of RiveScript Code .....	25
2.7 Example of an Intent .....	27
2.8 Example of Entities.....	28
2.9 General Chatbot Structure.....	30
2.10 An AI Text Chatbot and an AI Voice Chatbot .....	33
O1-O4 Participant's Chat Sessions with Andy English Bot in the Pilot Study .....	169
O5-O6 Participant's Chat Sessions with Peter in the Pilot Study .....	175
O7-O10 Participant's Warm-Up Sessions with Elsa in the Pilot Study .....	176

## LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AIML	Artificial Intelligence Markup Language
CALL	Computer-Assisted Language Learning
CLT	Communicative Language Teaching
CMC	Computer-Mediated Communication
EAP	English for Academic Purposes
EFL	English as a Foreign Language
ESL	English as a Second Language
ESP	English for Specific Purposes
LDA	Latent Dirichlet Allocation Algorithm
NLG	Natural Language Generation
NLP	Natural Language Processing
NLU	Natural Language Understanding
PCs	Personal Computers
TELL	Technology-Enhanced Language Learning
WP	Word Processing
XML	eXtensible Markup Language
ZPD	Zone of Proximal Development