

**AN INVESTIGATION OF RHIZOMATIC PERSONAL
LEARNING ENVIRONMENTS FOR AUTONOMOUS
LANGUAGE LEARNERS: THE CASE OF
MACROSIMULATION IN A VIRTUAL WORLD**



Kitisuda Parnkul

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Suranaree University of Technology has approved this thesis submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy

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งานวิจัยนี้ต้องการสำรวจสิ่งแวดล้อมทางการเรียนรู้ของผู้ที่เรียนภาษาด้วยตนเองผ่านการใช้โปรแกรมแมคโครซิมในโลกเสมือนจริง งานวิจัยนี้ได้ทำการทดลองกับนักศึกษาวิชาเอกภาษาอังกฤษธุรกิจที่ลงทะเบียนเรียนในรายวิชาภาษาอังกฤษเพื่อภัตตาคารและงานบริการเป็นระยะเวลา 10 สัปดาห์ ในภาคเรียนที่ 2 ของปีการศึกษา 2559 ณ มหาวิทยาลัยราชภัฏนครราชสีมา การวิจัยเป็นการวิจัยกึ่งทดลองซึ่งทำการศึกษากับกลุ่มนักศึกษาจาก 2 ห้อง จำนวน 62 คน ที่ถูกเลือกและแบ่งเป็นกลุ่มทดลองและกลุ่มควบคุม กลุ่มทดลองมีนักศึกษาจำนวน 39 คน จากนักศึกษาภาคปกติซึ่งลงทะเบียนรายวิชานี้กับผู้วิจัย และกลุ่มควบคุมมีนักศึกษาจำนวน 23 คน จากนักศึกษาภาคเสาร์-อาทิตย์ ซึ่งเรียนรายวิชาเดียวกันนี้กับอาจารย์ภาษาอังกฤษอีกท่านหนึ่ง การเก็บข้อมูลใช้เครื่องมือวิจัย 6 ชนิด คือ แบบทดสอบก่อนและหลังเรียน แบบสอบถามการเรียนรู้อย่างอิสระ แบบประเมินผลการใช้โปรแกรม MacroSIM คลิปวิดีโอและกลุ่มสนทนาในเฟซบุ๊กและไดอารี่ ข้อมูลเชิงปริมาณได้รับการวิเคราะห์และผ่านการทดสอบทางสถิติเพื่อหาค่าความแตกต่างอย่างมีนัยสำคัญ นอกจากนี้งานวิจัยชิ้นนี้ยังใช้วิธีการวิเคราะห์ข้อมูลเชิงคุณภาพซึ่งประกอบไปด้วย การวิเคราะห์เนื้อหา (Content analysis) และการวิเคราะห์วาทกรรม (Discourse analysis) ถูกนำมาใช้เพื่อศึกษาข้อมูลและนำผลที่ได้มาพิจารณาร่วมกับข้อมูลเชิงปริมาณด้วย

การศึกษาชิ้นนี้ได้สำรวจผลกระทบของการใช้โปรแกรมแมคโครซิมกับความสามารถทางภาษาอังกฤษของนักศึกษาวิชาเอกภาษาอังกฤษธุรกิจชั้นปีที่ 3 และยังสามารถศึกษาสิ่งแวดล้อมทางการเรียนรู้ในโลกเสมือนจริงร่วมด้วย โปรแกรมแมคโครซิมได้ถูกออกแบบมาเพื่อพัฒนาอิสรภาพทางการเรียนรู้เพื่อช่วยให้ผู้เรียนได้พัฒนากระบวนการเรียนรู้ภาษาอังกฤษของตนเองให้ดีขึ้น ผลการวิจัยพบว่าผู้เข้าร่วมวิจัยจากกลุ่มทดลองประเมินการใช้งานโปรแกรมแมคโครซิมในระดับสูง (3.92) ค่าเฉลี่ยสูงสุดที่สุดคือด้านประสบการณ์ในการเรียนภาษาอังกฤษอย่างมีอิสรภาพด้วยกิจกรรมของแมคโครซิม (4.59) ประสิทธิภาพของโปรแกรมสามารถดูได้จากพัฒนาการความสามารถทางภาษาอังกฤษ โดยการใช้แบบทดสอบก่อนและหลังเรียน แบบทดสอบดังกล่าวใช้รูปแบบการตอบแบบสอบถามชนิดเติมบทสนทนา (Discourse Completion Test) โดยการประเมินความสามารถทางภาษาแบ่งออกเป็น 4 ด้าน คือ การบรรลุวัตถุประสงค์ ความสุภาพและความเหมาะสม ตัวเลือกของคำศัพท์ และรูปแบบทางไวยากรณ์ การทดสอบทางสถิติระหว่างแบบทดสอบก่อนและหลังเรียนได้

แสดงให้เห็นว่าความสามารถทางภาษาอังกฤษในด้านการบรรลุวัตถุประสงค์ของกลุ่มทดลองมีความแตกต่างอย่างมีนัยทางสถิติ ($z = -2.358, p = 0.018 < 0.05$) ในขณะที่กลุ่มควบคุมไม่มีความแตกต่างใด ๆ ในด้านของการเรียนรู้ซึ่งมีอิสรภาพของผู้เข้าร่วมวิจัยในกลุ่มทดลอง การทดสอบทางสถิติบ่งชี้ว่าพวกเขาที่มีอิสรภาพในการเรียนรู้แตกต่างอย่างมีนัยสำคัญจากการตอบแบบสอบถามก่อนการทดลอง ($M = 2.09, SD = 0.58$) และหลังการทดลอง ($M = 4.00, SD = 0.48$) โดยมีค่า $t(38) = 14.13, p = .00001$.

ผลการศึกษานี้ชี้ให้เห็นว่าการเรียนรู้ทางภาษาของกลุ่มทดลองเกิดขึ้นอย่างเป็นธรรมชาติจากการใช้ภาษาอังกฤษผ่านการแสดงบทบาทสมมติซึ่งถือเป็นประสบการณ์ตรง โดยที่ในโปรแกรมแมคโครซิมไม่ได้มีการใช้ตัวกลาง (กล่าวคือ ผู้สอน และหนังสือเรียน) มาขึ้นกลางระหว่างผู้เรียนและภาษาอังกฤษ และผลการทดลองก็ได้บ่งชี้ว่าผู้เข้าร่วมวิจัยจากกลุ่มทดลองมีความสามารถทางภาษาดีขึ้นอย่างมีนัยสำคัญทางสถิติ



สาขาวิชาภาษาต่างประเทศ
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ลายมือชื่ออาจารย์ที่ปรึกษาร่วม [Signature]

KITISUDA PARNKUL : AN INVESTIGATION OF RHIZOMATIC PERSONAL
LEARNING ENVIRONMENTS FOR AUTONOMOUS LANGUAGE LEARNERS:
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ADVISOR : ASSOC. PROF. PANYATHON SANGARUN, Ph.D., 316 PP.

LEARNING AUTONOMY / PERSONAL LEARNING ENVIRONMENTS /
CONSTRUCTIVISM

The study aimed to explore on personal learning environments of autonomous learners who experienced learning English with MacroSIM program in a virtual world. The study was conducted for ten weeks with Business English students who enrolled in a course 'English for Restaurant and Catering Services' in the second semester of academic year 2016 at Nakhon Ratchasima Rajabhat University. This quasi-experimental study was implemented with two intact classes of 62 participants who were selected and assigned as an experimental group and a control group. The experimental group was 39 students from weekday program and 23 students were from weekend program. The data were collected from six research instruments: DCT pretest and posttest, learning autonomy questionnaire, evaluation questionnaire, Facebook group and recorded video clips, and student diary. The quantitative data were analyzed and tested statistically for significant difference. Moreover, qualitative analysis methods including content analysis and discourse analysis were employed to examine the data to triangulate with the quantitative results.

The study investigated the effect of MacroSIM program on English proficiency of third year Business English students, and also their personal learning environments in a virtual world. MacroSIM was intentionally designed to develop learning autonomy in order to help them improving their English learning process. The findings suggested that participants in the experimental group evaluated

MacroSIM program at 'high level' (3.92). The highest mean score (4.59) was about their experience of freedom in learning English with MacroSIM tasks. The program effectiveness can be seen from participants' English progress. Participants' English proficiency was assessed by DCT pretest and posttest with four language criteria: task fulfillment, politeness and appropriacy, word choice, and grammatical form. Statistical testing between pretest and posttest scores of the experimental group in the area of task fulfillment showed that there was a significant difference ($z = -2.358$, $p = 0.018 < 0.05$) while the control group was not different in any area. In terms of learning autonomy, statistical results also indicated that participants in the experimental group were more autonomous as there was a significant difference in their self-perception of learning autonomy before the implementation ($M = 2.09$, $SD = 0.58$) and after the implementation ($M = 4.00$, $SD = 0.48$) conditions; $t(38) = 14.13$, $p = .00001$.

The results of this study seem to indicate that learning process of a language occurs naturally with direct experience towards English. In MacroSIM there were not intermediaries (e.g. teacher and textbook) between the participants and English and the results show that the experimental group performed better statistically significant.

School of Foreign Languages

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TABLE OF CONTENTS

	Page
ABSTRACT (THAI)	I
ABSTRACT (ENGLISH)	III
ACKNOWLEDGEMENTS	V
TABLE OF CONTENTS	VII
LIST OF TABLES	XIII
LIST OF FIGURES	XVII
LIST OF ABBREVIATIONS	XVIII
CHAPTER	
1. INTRODUCTION	1
1.1 Background of the Study	1
1.2 Purposes of the Study.....	3
1.3 Research Questions.....	4
1.4 Significance of the Study.....	4
1.5 Definitions of Key Terms.....	5
1.6 Summary.....	7
2. LITERATURE REVIEW	8
2.1 Introduction.....	8
2.2 Defining Knowledge in Postmodernism	9
2.2.1 Knowledge Construction	10
2.2.2 The Learning Process in Constructivism.....	10
2.2.3 Learning in the 21 st Century.....	12

TABLE OF CONTENTS (Continued)

	Page
2.2.4 The Beginning of Learning.....	13
2.2.5 Learning is Change	14
2.2.6 Learning Needs.....	15
2.3 The Notion of Language.....	18
2.3.1 Language and Meaning.....	19
2.3.2 Language and Context.....	20
2.3.3 Language Competency.....	22
2.3.4 Language Proficiency.....	24
2.4 Learning Theories and Implication of Constructivism in Thailand.....	26
2.4.1 Learning Theories in Thailand.....	26
2.4.2 Constructivist Approach in English Language Teaching in Thai Education	28
2.4.3 Macrosimulation in Language Pedagogy.....	31
2.4.4 Previous Study Related to Macrosimulation in Language Learning..	34
2.4.5 Assessment of Language Knowledge.....	36
2.4.6 Constructive Evaluation for Learning.....	40
2.5 Autonomous Language Learners	42
2.5.1 Importance of Learning Autonomy.....	44
2.5.2 Roles of Language Learners in Constructivist Learning Environment ...	47
2.5.3 Roles of Language Teachers in Constructivist Learning Environment.....	49

TABLE OF CONTENTS (Continued)

	Page
2.6 Learning Environment in the 21 st Century	50
2.6.1 Personal Learning Environments (PLEs)	51
2.6.2 Self-Organized Learning Environments (SOLEs).....	53
2.6.3 Rhizomatic Learning Structure	57
2.6.4 Previous Studies Related to Rhizomatic Learning Structure	59
2.6.5 Virtual Learning Environments (VLEs).....	62
2.6.6 Virtual Learning Environments (VLEs) and Language Learning.....	68
2.6.6.1 Second Life by Linden Lab	70
2.6.6.2 IMVU by IMVU Inc.....	73
2.6.7 Previous Studies Related to Language Learning Through Virtual Learning Environments.....	75
2.7 Conceptual Framework.....	78
2.8 Summary.....	79
3. RESEARCH METHODOLOGY.....	80
3.1 Introduction	80
3.2 Research Design.....	80
3.2.1 Participants.....	82
3.2.2 Variables.....	83
3.3 Research Instruments.....	83
3.3.1 MacroSIM.....	83

TABLE OF CONTENTS (Continued)

	Page
3.3.2 Learning Time and Learning Resources	90
3.3.3 Pretest and Posttest.....	91
3.3.4 Evaluation Questionnaire.....	92
3.3.5 Learning Autonomy Questionnaire.....	95
3.3.6 Facebook Group and Recorded Video Clips.....	97
3.3.7 Language Use in the IMVU Virtual World.....	98
3.3.8 Feedback Protocol	99
3.3.9 Student Diary.....	100
3.4 Validity of the Instruments.....	100
3.5 Data Collection Procedures.....	101
3.5.1 General Procedures.....	102
3.5.2 Specific Procedures.....	102
3.6 Data Analysis.....	103
3.6.1 Quantitative Data Analysis.....	103
3.6.2 Qualitative Data Analysis.....	104
3.7 Summary.....	104
4. RESULTS AND DISCUSSIONS.....	105
4.1 Introduction	105
4.2 Quantitative Results of English Differences	106
4.2.1 Overall Differences of English Proficiency of all Participants...	106
4.2.2 Differences of Sentence Length of the Experimental Group	108

TABLE OF CONTENTS (Continued)

	Page
4.2.3 Differences of Sentence Length of the Control Group	110
4.2.4 Differences of English Proficiency According to the Four Criteria.....	113
4.2.5 Progress of English Proficiency after the Implementation	116
4.2.6 Significant Difference of English Proficiency between Groups	121
4.2.7 Significant Difference of English Proficiency within Groups	122
4.2.8 Discussion of the Quantitative Results on Language Differences.....	125
4.3 Qualitative Results of English Differences	128
4.3.1 Differences of English Use.....	129
4.3.1.1 Qualitative Results of Emerging Language Patterns of the Experimental Group.....	131
4.3.1.2 Qualitative Results of Emerging Language Patterns of the Control Group	146
4.3.2 Differences of Language Proficiency Regarding Four Language Criteria of the Experimental Group	157
4.3.3 Differences of Language Proficiency Regarding Four Language Criteria of the Control Group	171
4.3.4 Discussion of the Qualitative Results on Language Difference.....	184
4.4 Learners' Perceptions of MacroSIM	194
4.4.1 Quantitative Results from Evaluation Questionnaire	195
4.4.2 Participants' Comments towards MacroSIM	199
4.4.3 Qualitative Results from Diary about MacroSIM	200
4.4.4 Discussion of the Findings about MacroSIM	212

TABLE OF CONTENTS (Continued)

	Page
4.4.4.1 Positive feelings of Using MacroSIM as a Learning Tool...	213
4.4.4.2 Disadvantages in Using MacroSIM as a Learning Tool....	214
4.5 Investigation of Learning Autonomy	215
4.5.1 Quantitative Results from Autonomy Questionnaire	215
4.5.2 Qualitative Results from the Diaries about Learning Autonomy	221
4.5.3 Discussion of the Findings about Learning Autonomy	222
4.6 Characteristic of Virtual Learning Environments of Autonomous Language Learners	223
4.6.1 Investigating Personal Learning Environment of Autonomous Language Learners.....	223
4.6.2 Quantitative Results of Communication Pattern in MacroSIM.....	230
4.6.3 Qualitative Results from the Video Clips	235
4.6.4 Discussion of the Findings about Virtual Learning Environment.....	242
4.6.3.1 Communication Pattern in a Virtual Learning Environment.....	242
4.6.3.2 Virtual Learning Environments of Language Autonomous Learners.....	244
4.7 Summary.....	245
5. CONCLUSIONS AND RECOMMENDATIONS.....	247
5.1 Summary of the Study	247
5.1.1 Principles of the Language Learning Environment	247

TABLE OF CONTENTS (Continued)

	Page
5.1.2 Learning Autonomy	248
5.1.3 Constructivist Learning Environment	250
5.2 Significance of the Findings	251
5.2.1 The Findings of MacroSIM Implementation	251
5.2.2 The Findings of the Language Functions in Service Business Context....	256
5.2.3 Participants' Satisfaction with MacroSIM	257
5.3 Pedagogical Implication	259
5.3.1 Heteronomous and Autonomous Behavior in Education.....	259
5.3.2 Application of Constructivist Learning Environment	
Enhancing Language Learning	261
5.3.3 Characteristics of Developed Language Proficiency	263
5.4 Limitations of the Study	264
5.4.1 Limitations of the Study	264
5.4.2 Recommendations for Further Study	265
REFERENCES.....	268
APPENDICES.....	295
CURRICULUM VITAE	316

LIST OF TABLES

Table	Page
2.1 Differences of Role-play Technique and Global Simulation Approach in Language Teaching	35
2.2 Constitutive Elements of Language Learning Autonomy (Cooker, 2012).....	48
2.3 Comparison of Arborescent and Rhizomatic Thinking by Cath Ellis	58
2.4 Disadvantages of Using Second Life in Education Provided by Christine L. Mark (Mark, 2012)	72
3.1 Roles and Assigned Actions in MacroSIM	86
3.2 Evaluation Questionnaire adapted from Gil-Gómez et al. (2013)	96
3.3 Twelve Elements of Learning Autonomy Questionnaire Adapted from Constitutive Elements of Learner Autonomy by Lucy Cooker (2012)	96
3.4 Research Question, Instruments, and Objectives	101
4.1 Pretest and Posttest Scores of the Experimental and Control Groups	107
4.2 Comparison of Sentence Length of the Experimental Group	108
4.3 Differences of Sentence Length and Score Achievement of the Experimental Group	109
4.4 Comparison of Sentence Length of the Control Group	111
4.5 Differences of Sentence Length and Score Achievement of the Control Group	112
4.6 Median Scores of English Proficiency According to Four Criteria	114
4.7 Progress of English Proficiency of the Experimental Group	116
4.8 Progress of English Proficiency of the Control Group	119

LIST OF TABLES (Continued)

Table	Page
4.9 Wilcoxon Rank-Sum Test Results of Pretest Scores	121
4.10 Wilcoxon Rank-Sum Test Result of Posttest Scores	122
4.11 Wilcoxon Signed-Rank Test Comparison to Examine Differences of English Proficiency of the Experimental Group.....	123
4.12 Wilcoxon Signed-Rank Test Comparison to Examine Differences of English Proficiency of the Control Group	124
4.13 Emerging Language Patterns after the Implementation	130
4.14 Comparison of Pretest and Posttest Scores of the Experimental Group.....	157
4.15 Comparison of Pretest and Posttest Scores of the Control Group	172
4.16 Advantages of Learning English through MacroSIM	196
4.17 Limitations of Learning English through MacroSIM	197
4.18 Difficulty of Learning English through MacroSIM	198
4.19 Overall Findings of all Diaries	200
4.20 Categories of Participants' Comments towards MacroSIM	201
4.21 Overall Results of Participants' Self-Perception on Learning Autonomy	216
4.22 Differences Value of Learning Autonomy of the Experimental Group	217
4.23 Results of Participants' Self-Perception of Learning Autonomy	219
4.24 Statistical Results of Learning Autonomy	220
4.25 Results of Participants' Diaries Regarding Self-Planning	224
4.26 Results of Participants' Diaries Regarding Self-Awareness Raising	225
4.27 Results of Participants' Diaries Regarding Self-Evaluating	226
4.28 Results of Participants' Diaries Regarding Conceptualizing	227

LIST OF TABLES (Continued)

Table	Page
4.29 Roles Taking from Week 4 th of the Experiment	231
4.30 Total Time Spent in the Simulation of Week 4 th of the Experiment	234
4.31 An Excerpt from a Simulation Scene in a Restaurant.....	238
4.32 An Excerpt from a Simulation Scene of a Job Interview	241
5.1 Two Groups of Language Pattern Emerge From Posttest Responses	252



LIST OF FIGURES

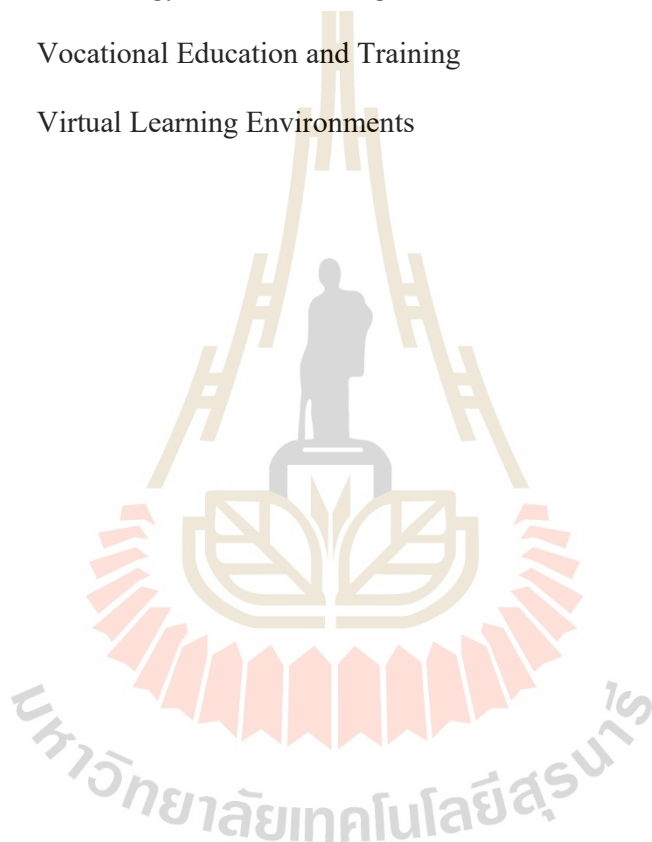
Figure	Page
2.1 Representation of the Flow of Information for a Specific Group of Children at a Learning Station (Hole-in-the-wall, 2016)	55
2.2 Sample of Personal Learning Network (Pineda, 2013)	61
2.3 Tools and Process in PLE (Saadatmand and Kumpulainen, 2012)	62
2.4 A Scene from Second Life Virtual World	71
2.5 Sample of a Chat Room in IMVU	74
3.1 List of Available Restaurants in IMVU Virtual World	87
3.2 Participants Introduced Themselves to Foreigners in IMVU	89
4.1 Differences of English Proficiency According to Four Language Criteria	115
4.2 English Proficiency Before and After of the Experimental Group	118
4.3 English Proficiency Before and After of the Control Group	120
4.4 Trend of Self-Perception of Learning Autonomy Before and After the Implementation	217
4.5 Matrix Graph of the Role Simulation of the Experimental Group	232
4.6 A Simulation Scene in a Restaurant From a Video Clip	237
4.7 A Simulation Scene of a Job Interview	240
4.8 A Chord Graph of All Interactions of the Experimental Group	243
4.9 A Self-Driven Learning Model of Autonomous Language Learners	244
5.1 Learning Loop of Language Autonomous Learners	255

LIST OF ABBREVIATIONS

3Cs	Confront Contrast Contest
ABAR	Active Balance Rehabilitation
CLT	Communicative Language Teaching
CMC	Computer-Mediated Communication
EF EPI	EF English Proficiency Index
HDM	Head-Mounted Display
IMVU	Instant Messaging Virtual Universe
IOC	Item Objective Congruence
LTSN	Learning and Teaching Support Network
MacroSIM	Macrosimulation
MMOGs	Massively Multiplayer Online Games
MUVES	Multi-User Virtual Environments
NIETS	National Institute of Educational Testing Service
NRRU	Nakhon Ratchasima Rajabhat University
OEC	Office of the Education Council
O-NET	Ordinary National Educational Test
PLEs	Personal Learning Environments
SEQ	Suitability Evaluation Questionnaire
SIEs	Synthetic Immersive Environments

LIST OF ABBREVIATIONS (Continued)

SOLEs	Self Organized Learning Environments
TED Talk	Technology Education Design Talk
VET	Vocational Education and Training
VLEs	Virtual Learning Environments



CHAPTER 1

INTRODUCTION

The current study investigates an English learning environment based on the notions of postmodernism and constructivism. Postmodernism describes how knowledge is constructed while constructivism explains the learning process. These two notions, postmodernism and constructivism, are integrated with each other as the principles of this study.

1.1 Background of the Study

English learning and teaching in Thailand has shifted away from a teacher-center paradigm and moved towards a learner-center paradigm due to Thailand's educational reforms in 1999 and 2007. The teaching methods have also shifted from focusing on memorizing and reciting information (Batchelor, 2005, p.154) to developing communicative skills. In addition, technology has integrated into the learning process to promote Thai EFL learners' English language proficiency. Despite all of these changes, Thai EFL learners still cannot develop their English proficiency effectively.

According to the report of EF EPI (2018), it could be inferred that Thais gain only a low level of English proficiency when compared with the other 9 countries in

ASEAN. In 2018, Thailand was ranked 64th out of 88 countries and was considered as a low proficiency country (EF EPI, 2018). The 2017 O-NET scores (NIETS, 2018) show that the average English scores of Thai primary, secondary, and high students are below 40%. The average English score of Thai primary students was 36.34% and for secondary students was 30.45%. Thai high school students received the lowest average score of all groups, with 28.31% (NIETS, 2018).

Studies show that some causes of Thai EFL learners low proficiency are rote learning, decontextualized learning environments, lack of authentic learning resources, insufficient technology support for their learning process (Punthumasen, 2007), “an overabundance of curriculum content, students inadequately prepared for the level at which they studied, teachers inadequately prepared, inadequate materials and equipments, insufficient budgets, large class sizes, inadequate assessment, over-reliance on multiple choice tests” (Wongsothorn, Hiranburana, & Chinnawongs, 2002) and unqualified and poorly-trained teachers, poorly-motivated students, learners of mixed abilities in overly large classes, and rare opportunities for student exposure to English outside of class time (Noom-ura, 2013).

Studies also show that virtual learning environments can promote EFL learners' English proficiency because they help students to comprehend abstract concepts more easily than traditional approach (Boyles, 2017). With these three features of virtual reality: real-time interactivity, strong immersion, and high

imagination (Chung, 2012) learners gain benefits directly for their language learning processes. Sarac (2014) studied the advantages of using virtual reality in English teaching. It was a qualitative study among five English teachers from different universities in Turkey. The researcher concluded that there were eight benefits of applying virtual reality to an English course. They were 1) overcoming identity issues via avatars, 2) synchronous and asynchronous education, 3) sharing of materials online, 4) allowing autonomy for learners and teachers, 5) overcoming physical issues of crowded classroom, 6) motivating students, 7) collaboration and interaction, and 8) experiencing authentic language use (Sarac, 2014).

However, there is a small number of studies that investigates the effectiveness of virtual learning environments for language learning. More research is needed to provide additional principles for developing virtual learning environments for foreign language learning. The present study aims to partially fill this gap in previous research.

1.2 Purposes of the Study

The purposes of this research are:

- 1) To investigate the effects of a language learning environment (MacroSIM) on EFL learners English proficiency.

- 2) To investigate the learners' perceptions of their learning process after learning English through MacroSIM.
- 3) To explore a sample of the personal learning environments of autonomous language learners who learned English through MacroSIM.

1.3 Research Questions

- 1) What are the effects of MacroSIM on EFL learners' English proficiency?
- 2) What are the learners' perceptions of the learning process under MacroSIM?
- 3) How do the learners perceive the value of learning autonomy?
- 4) What are some of the characteristics of individual virtual learning environments as perceived by the learners?

1.4 Significance of the Study

The findings of the study can:

- 1) Provide guidance on how to create a constructivist learning environment for autonomous language learners in the 21st century.
- 2) Help raising and understanding of the language learning process and how to strengthen its structures.
- 3) Provide guidance on how to create virtual environments for language learning.

- 4) Provide guidance on how to develop business English courses.

1.5 Definitions of Key Terms

- **Rhizomatic approach**

The definition of rhizomatic language learning is derived initially from Deleuze & Guattari (1987, pp. 6-7) and developed for language learning by Lian (2004). In this perspective, a rhizomatic learning structure consists of “a set of conditions which allows for multiple, non-hierarchical entry and exit points in data representation and interpretation” (Lian, 2004, p.5). This means that a learning environment created on these principles [...]” is the very antithesis of a tree structure” (Lian, 2004, p. 5) where every activity is pre-planned and pre-ordained by a syllabus. There is no syllabus as such. Instead, the power of decision-making, of constructing their own” syllabus”, is vested in the learners who create their own path through learning resources that are provided either by the learning institution or are identified by the learners themselves. In such an autonomous structure, “it means that learners are able to connect from any activity or information point to any other activity or information point according to perceived need” (Lian, 2004, p. 5), and the “syllabus” becomes a description of the choices made by the learners rather than a prescription established by the teacher/learning organization. A rhizome, then, is a record of the paths actually taken rather than thesequences imposed by authority. “A

rhizomatic structure should not be thought of as chaotic but rather as a self-regulating structure responsive to the learners' needs as determined by the mechanisms in place (human or otherwise) for determining such needs.” (Lian, 2004, p.5)

- **Learning autonomy** means the ability of learners to plan and control their own actions to do things at their will. This ability includes re-planning if some goals cannot be reached: they need to be able to re-plan in order to try an alternative approach. (Piaget, 1973; Toffler, 1990; Darwell, 2006)

- **Personal Learning Environments) PLEs** refer to intangible spaces where learners integrate many tools as learning resources to support their own learning process both online and offline (of the face-to-face). (Lian, 2004; Lian& Pineda, 2014)

- **Virtual Learning Environments) VLEs** refer to learning spaces in a virtual world that enable learners to interact with others for strengthening their structures of learning systems. (Sykes, 2010; Collentine, 2011)

- **MacroSIM** is the English learning environment designed by the researcher to support language learning. It is underpinned by postmodern and constructivist concepts. MacroSIM constitutes the “treatment” in this study.

1.6 Summary

This chapter was an overview of the background and context of the study. It covered the rationale, purposes, research objectives, research questions, significance, and definitions of key terms.



CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter offers a review of literature related to this research project. It is divided into seven sections. First, it defines two main concepts of knowledge and learning as the principles underpinning this study. The second section discusses the notion of language including language and meaning, language and context, language competency, and language proficiency. The third section is about language learning in a constructivist learning environment with the notions of learning theories in Thailand. These include the constructivist approach in English learning in Thai education, English for Specific Purposes, macrosimulation in language learning, assessment of language knowledge, and constructive evaluation for learning. Then the fourth section is about autonomy of language learners in the information age. This section looks at the roles of language learner and teacher in constructivist learning environment. The fifth section reviews various aspects of learning environments including Personal Learning Environments (PLEs), Self-Organized Learning Environments (SOLEs), Rhizomatic learning structure, previous studies related to Rhizomatic learning structure, Virtual Learning Environments (VLEs), and Virtual Learning Environments and language learning. It concludes with previous studies related to language learning through virtual learning environments. The conceptual framework of this study is then described in the next section. Finally, a summary of

the whole chapter is presented at the end.

In order to facilitate the learning process, it is crucial to understand knowledge construction and learning system. These two concepts are important to the teaching role as they directly influence teaching practices and also affect learner's learning processes. In this research, postmodernism provides the critical idea which forms the basis of teaching principles, and acts as a foundation for this project.

2.2 Defining Knowledge in Postmodernism

Postmodern thought derives from poststructuralism (Sim, 2001) which was first used to reject the modernism thought that there are universal, objective and infallible foundations for our knowledge (Gregg, 2000). Postmodernism warns us to be aware of diversity, fragmentation, discontinuity, uncertainty, and indeterminacy (Rosenau, 1991). Smith (2010) pointed out that postmodernists propose this contrasting idea of modernity to criticize the positivist concepts of science, method, and measurement. Modernism gives meaning to things that can be measured and ignores things that are not measurable. In the sense of positivism, everything can be explained in a form, language, statistics, rules, or theory. This logic dominates in the academic field (Smith, 2010) which misleads us into thinking that knowledge can be reified into a form which can then be transferred to our students through teaching. It is a dramatic misunderstanding of the situation as Lyotard (1984) described clearly that knowledge is assumed to be an internal construct of each individual for one's own personal use. Barnett (2000) concluded that knowledge has no form, no conditions, and no limits.

2.2.1 Knowledge Construction

Knowledge is a combination of meanings that are attributed to something by each person, and people use that knowledge for their living. Construction of knowledge is invented in people's minds, not discovered from other sources like teachers, books, internet, or television. Meaning is constructed according to individual experience; Fosnot (2005) explained that humans actively make connections and generate understandings of every experience. People automatically interpret, organize, and infer new information with their previous experiences. Therefore, meaning is individually derived from different personal perspectives and, as a consequence, meaning varies from one person to another. Thus, each person's knowledge cannot be the same as anyone else's. One important aspect of meaning is context-dependency (Sim, 2001) as postmodernists view meaning as a social construction. Therefore, knowledge construction needs context to enable comprehension. In conclusion, knowledge is individually constructed from meanings that learners generate from each situation, and none of the generated knowledge can claim that it is correct as knowledge differs according to the multiple perspectives of those who construct it.

2.2.2 The Learning Process in Constructivism

Constructivism is a theory of knowledge (von Glasersfeld, 1989) used to study cognitive development and learning processes. Fosnot (2005) used biological models to explain the dynamic origin of development, learning, and evolution of a living being. The model is organized as a network with non-linear system. Cells, as a part of autopoietic, non-linear, systems, interact with their environment to change in two ways: 1) for self maintenance and 2) for creating new structures as a consequence of environmental influences. This constructivist model of learning emphasizes cells and

environments which connect together; and cells spontaneously change themselves to preserve connections with the environment. Its implications for learning are that humans try to make understanding of everything new based on their past experiences. When it comes to the point that they cannot rely on their past experiences, they will make a new structure to link with the environment in order to preserve coherence. Learning is the process of self-organizing meanings for personal use by interacting through autopoietic system with the environment in order to stay alive.

Constructivism is neither the theory of learning nor teaching; it tells about how knowledge is constructed rather than offering ready-made theories. Constructivism gives a broad sense of conceptual framework for classroom practice (Airasian and Walsh, 1997) which assumes that learning is self-regulating process that constructs knowledge by interacting with social (von Glasersfeld, 1995). So, the way to foster learning should not against its process. Airasian and Walsh (1997) provided a set of cautions for constructivist practice in education.

- 1) Do not fail to recognize the difference between an epistemology of learning and a well-thought-out and manageable instructional approach for implementing it.
- 2) Do not fall into the trap of believing that constructivist instructional techniques provide the sole means by which students construct meanings.
- 3) Do not assume that a constructivist orientation will make the same demands on teaching time as a nonconstructivist orientation.
- 4) Do not believe that the opposite of 'one-right-answer' reductionism is 'anything-goes' constructivism.

To understand more deeply in the constructivist paradigm, Airasian and Walsh (1997) elaborated that constructivism is a descriptive, not prescriptive, model of knowing and learning. Constructivism does not provide strict structure for

implication, but it is open to the teacher's idea if his/her approach is appropriate with the learners. This is the basic premise of postmodernism which holds that knowledge can be understood through different perspectives.

Therefore, learning environment is very essential to language learners as it fosters learning process where learners can freely construct their own meaningful knowledge.

2.2.3 Learning in the 21st Century

The act of learning in the 21st century is different from the past where learners integrate modern technology into their learning. Due to the vastly impact of modern technology on education, Lian (2011) identified eight trends of (language-) learning in this century as; 1) an unprecedented rate of change; 2) an unprecedented richness of information; 3) a growing emphasis on interdisciplinarity; 4) the potential growth of a research mentality; 5) the centrality of meaning-making in all learning; 6) the power of social networking; 7) the need for creativity and divergent thinking; 8) the empowerment of the learner. Therefore, learners themselves can be active in their own learning process because technology places the most powerful tools in their hands. Thus, learners should have the potential to analyze texts provided by technology not for accuracy but suitability for their own use and be able to use technology for effective learning.

Alvin Toffler, a futurist, suggested that 'The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn' (Toffler, 1970, p.414). His suggestion infers that language learners require more than basic skills e.g. listening, speaking, reading, and writing, to develop their language proficiency. In addition, learners need to be able to use their prior

knowledge to make sense of the environment. In order to stay connected with the environment they should be able to re-organize their meanings according to new experience and consider abandoning previous knowledge and constructing new knowledge instead. Learners should have a sense of being in a world of uncertainty, unpredictability, contestability, and challengeability as Barnett called it supercomplexity (Barnett, 2000). Lian and Pineda pointed out that learners in the 21st century should be able ‘to deal with countless unpredicted and unpredictable real life problems occasioned by changing circumstances’ (Lian and Pineda, 2014, p.6). Learners should have opportunities to practice life skills to deal with uncertainty as it is the main characteristic of the real world. The World Health Organization (WHO, 1977, p.1) defined life skills as ‘abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life’. Therefore, it is important for a learning environment to be realistic (i.e. reflect real-life contexts). It should not be simplified; otherwise learners lose chances to develop essential skills that they need in their future life.

2.2.4 The Beginning of Learning

Learning is a continuous process which naturally occurs with or without consciousness. The learning process can never end as long as one is alive; it happens spontaneously when one experiences everything in one’s social setting. The learning process starts with meaning interpretation through perception which is the only human intermediary that acts as a multi-layer of filters for personal interpretation. Pierre Bourdieu, a French sociologist, introduced this as the concept of habitus ‘is the system of structured, structuring dispositions, the habitus, which is constituted in practice and is always oriented towards practical functions’ (Bourdieu, 1990, p.52).

Each layer of filter is embedded in the experiences of one's interaction with one's environment since early childhood and forms 'mental dispositions, schemes of perception and thought, extremely general in their application,... and also, at a deeper level, in the form of bodily postures and stances' (Bourdieu, 1977, p.15). Swartz asserted that the system of multi-layer filters functions as a generator of 'perceptions, aspirations, and practices that correspond to the structuring properties of earlier socialization' (Swartz, 2002, p.103). That is to say the habitus is the starting point of the learning process as the disposition-structuring starts from the birth of a child, and the child depends on those dispositions for generating understanding of everything for his/her life.

2.2.5 Learning is Change

On the other hand, the effects of learning can be seen through actions. As Driscoll stated, 'learners are capable of actions they could not perform before learning occurred' (Driscoll, 2005, p.9). Consistent with Bourdieu's intellectual position is the belief that if one's habitus is unable to respond to a specific situation, it is forced to change (Swartz, 2002). Even though that change takes time as described by Navarro who said 'habitus is created through a social. It is not fixed or permanent, and can be changed under unexpected situations or over a long historical period' (Navarro, 2006, p.16). Interestingly, Bourdieu (1990, p.56) elaborated that 'habitus is spontaneity without consciousness or will' but changing it is a conscious action as Wittgenstein (cited in Bourdieu & Wacquant, 1992, p.1) argued that:

'Getting hold of the difficulty deep down is what is hard. Because it is grasped near the surface it simply remains the difficulty it was. It has to be pulled out by the roots; and that involves our beginning to think in a new way. The change is as decisive as, for example, that from the

alchemical to the chemical way of thinking. The new way of thinking is what is so hard to establish. Once the new way of thinking has been established, the old problems vanish; indeed, they become hard to recapture. For they go with our way of expressing ourselves and, if we clothe ourselves in a new form of expression, the old problems are discarded along with the old garment.'

This also corresponds well with Alvin Toffler's quote that unsuccessful learners in the 21st century are people who cannot learn, unlearn, and relearn (Toffler, 1970). Effective learners should be more critical in considering their own knowledge even though it was usable in the past but it might not be in the future because of uncertainty. Habitus effectiveness is vital to learning as Bourdieu claimed that 'the practices produced by the habitus, as the strategy-generating principle enabling agents to cope with unforeseen and ever-changing situations, are only apparently determined by the future' (Bourdieu, 1977, p.72).

2.2.6 Learning Needs

Learning is an active process and it requires learners' engagement to manage their own learning journey. Giving the right answer is good for learning, but wrong answer is like a trigger for learning as well. Fosnot proposed constructivist practices that stimulate learning by providing 'disturbers of equilibrium' (cited in Lebow, 1993, p.10). When knowledge is in a state of disequilibrium it means that there is something contrasting between prior knowledge and the task. These are 'errors' in constructivist terms and Lebow described them as follow: 'errors are seen as positive stimulants for the kinds of perturbations that create disequilibrium necessary for self-reflection and conceptual restructuring' (Lebow, 1993, p.12). He continued by explaining that 'negative impact of errors' is sensitive to learner's motivation (Lebow, 1993, p.12). These errors reveal learning needs which are crucial for the learning process and

learners should be able to identify their own needs, otherwise they cannot modify their habitus to suit that environment. Lian (2011) explained that learning needs are found when learners cannot use their knowledge or understanding to solve some problems. Learning needs are the gaps between learners' capabilities and requirements of the task, and learners should know how to fill up those gaps to accomplish the task. If they cannot do it by themselves, they should know how to find some sort of assistance whether human or non-human to help them. In a pedagogical sense, to be able to identify needs learners should be notified about those gaps; in other words they should have a sense of awareness by explicit or implicit notification. To raise awareness, a simple formulation by Lian (2000) is to 'transform the meaningless into the meaningful'. Without awareness, learners are unable to notice their needs, and they always see what they have seen before. Unless their meaning-making mechanism is re-configured, then they will notice what their needs are and they will be able to change or fill up those needs. However, the learning needs of each learner are diverse as past experiences or habitus of each person cannot be identical.

To be able to identify learning needs is necessary because it guides the direction of the learning process; but it is not easy for learners who are new in that environment or who encounter a new situation. The real world has many characteristics of supercomplexity as Barnett (2000) mentioned; it is generated from layers of meaning so there are various methods to make sense of it. Therefore, the steps of learning something of each one may differ according to their individual perception. Once needs are identified, then the learning process begins as learners are meant to fill up those gaps to accomplish the task. They realize that those gaps are essential and meaningful. In other words, each learner has an individual way to make

his/her own path to that knowledge, and Lian (2004) proposed a learning structure with a rhizomatic approach in which learners are free to create understanding about that knowledge with any activities that meet their needs. The rhizome is a concept of organizational structure proposed by Deleuze and Guattari which well reflects the essence of postmodernism (Sim, 2001). The notion of rhizomatic approach will be discussed later.

It can be concluded that humans construct their own knowledge by socializing with others in environments, and that the learning process of each one is varied and depends on the habitus (previous knowledge). The learning process occurs when learning needs are identified by individual perceptions, are met by the learner, and result in human learning which is characterized by a changing performance. Under these circumstances, it is impossible that everyone will have the same journey of learning; even if the starting point happens to be the same. In addition, a one-size-fits-all approach for assessing learning is inappropriate as it cannot reflect the variety of learning results from all learners. In order to avoid inequality of assessment, any checking learning performance should be aware of individual differences rather than having a preset goal for everyone. As Fosnot and Perry stated that 'learning is not the result of development; learning is development' (Fosnot and Perry, 2005, p.33). Therefore, assessing the results should focus on the learning progression of each individual instead of setting a set of standard for measuring. These concepts of knowledge construction and of the learning process are regarded as the principles of this study. The following section reviews notions of language in order to understand its essence and will be used for organizing the learning environment of the study.

2.3 The Notion of Language

Language is comprised of many components, not only linguistic items, which are used when humans try to communicate meanings to others. Guberina stated that ‘the emergence of speech itself reveals all of its structural components: context (situation), rhythm, intonation, intensity, tenseness, mimics, and gestures’ (Guberina, 1999, p.1). These linguistic and non-linguistic items are also encrypted with meanings. These items are chosen to be used intentionally and depend on individuals and situations. Thus, to study a language by knowing its rules and forms of linguistic items as linguists decided is not enough for communication. There is something more to interpret for meanings.

In conclusion, learning language is more than skill mastery because when communicating there are complex combinations of language devices which are required for making meanings. Language is one of many tools that humans use to represent meanings in their minds. Those meanings are coded as various signs, and humans attempt to organize these signs to communicate with others (e.g. through language, gesture, eye contact). Therefore, speakers/authors need to have potential in making those signs understandable to others. On the other hand, listeners/readers also have to be proficient enough to make sense of those signs. That is to say language learning should prepare learners to be able to perform these tasks efficiently. Goodwin and Duranti concluded that language learning is a process of ‘language socialization’ (Goodwin and Duranti, 1992, p.1) that is learners learn how to manage language signs to socialize with others in their communities.

2.3.1 Language and Meaning

Humans use language for communicating ideas, thoughts, or meanings to others (Lantolf, 1996); so, the essence of meanings is the highest priority of communication. Humans capture those meanings that pre-exist in their heads and put into words to present to others. Language has the limitation of indirect phenomena; it is not a container of meanings. The sender modifies his/her meanings into words, and the receiver modifies it again for understanding. That is to say meanings are constructed by the receivers. Meaning is 'a fleeting phenomenon' (Sim, 2001, p.6) as it will be reconstructed instantly for comprehension after being presented to the receiver. When A and B have a conversation, A's meanings are still in A's brain, and B tries to develop an understanding of A's signs by relying on his/her own past experiences to interpret those signs.

Jacques Derrida (1968), a French philosopher, introduced the word 'différance' to indicate that there are always some discrepancies between words and meanings. Meanings are slippery; they cannot be fixed in words (Schmidt, 1983) as in a dictionary. Meanings in a dictionary are given by isolating words from their context; they are given by others' judgments for a specific time and occasion. Levinas explained that 'meanings are not limited to any special region of objects, are not the privilege of any content' (Levinas, 1987, p.78). Therefore, using others' meanings (i.e. looking up meanings in a dictionary) is not the way to understand real meanings. Meaning construction is an individual process as Lian (2004, p.3) described that 'meaning is never found but constructed internally by each individual'. The meaning making process is influenced by personal logical and representational systems in which each individual produces from past experience.

Meanings are reduced to present in a form of several signs, but actual meanings beyond the given words also matter for interpretation. Levinas (1987, p.75) stated that ‘absent contents confer a meaning on the given’ which means that not only the given words can convey meanings; but related signs (i.e. opposite words) can illuminate actual meanings. Derrida also pointed out that ‘signs represent the present in its absence... when the present does not present itself, then we signify, we go through the detour of signs’ (Derrida, 1973, p.138). This means that the relation of the signs can be used as a reference for interpretation. In the aspect of language learning, learners should be encouraged to predict meanings by applying their language knowledge to generate meanings from the signs. In addition, the surrounding environment of the signs is also helpful. However, signs have meanings in their environments without being context signs are useless.

2.3.2 Language and Context

Language and context are influenced by each other, and they cannot be separated as Halliday and Hasan noted that ‘text is language operative in a context of situation and contexts are ultimately construed by the range of texts produced within a community’ (Halliday and Hasan, 1989, p.117). On the other hand, context acts as a frame for language users to create texts that suit it. Context is both supportive and forceful. It can assist learners in the meaning-making process, and it also has the power to control use of language. One important aspect of context is its dynamic which O’Donnell argued that ‘all of context does change through an interaction’ (O’Donnell, 1999, p.2). He asserted that context should be seen ‘at risk of changing’ (O’Donnell, 1999, p.2) rather than static. Therefore, language learners should be notified to be aware of this by having them experience language in a diverse context

to avoid any misinterpretation that may have caused problems in their interactions.

The operations of the human brain are multifunctional; it processes signals from several sensory systems simultaneously for meaning making. It is a complex task and not one-to-one correspondence as Oatley (cited in Fosnot & Perry, 2005, p.30) noted that ‘a major function of the human brain is indeed to sustain complex structures of knowledge of the physical world’. It could be said that the human brain works well with complex tasks; a recent study of MIT neuroscientists also confirmed that ‘a small number of simple tasks’ does not correspond to the brain function. On the contrary, multitasks can accelerate the brain’s ability (Fusi, Miller, & Rigotti, 2016, p.66). That means simplified or decontextualized lessons such as lecturing may be difficult to comprehend because they are not compatible with human brain function. In other words, these synthesized lessons provide limited resources for learners to develop understanding.

The production of language is not controlled by humans only, it can be influenced by context as Halliday and Hasan stated that language is ‘shaped or patterned in response to the context of situation in which it is used’ (Halliday & Hasan, 1989, p.vii). Context can be an obstacle if it is misconceived. Context can be seen from two perspectives: static and dynamic. Sefton (cited in O’Donnell, 1999) exemplified this concept by illustrating a cyclist who is cycling through a village with a mountain view at the back. When cycling, the mountain seems static because it is huge and distant, but houses and fences along the way are radically changed. If the cyclist cycles for an hour, the view of the big mountain at the back is different from that of the starting point. This metaphor implies that context is changing through time, and it definitely affects the language. For example, it is possible that two speakers

may change their mode of conversation from formal to informal style after talking for a few hours.

In pedagogical practice the notion of context is essential for language learning because of its ambiguous qualification. It is powerful in the sense of assistant and controller, so language learners should have language experience from authentic environments in order to develop ability in the process of meaning-making. Furthermore, given the characteristic of context discussed above (i.e. its instability) language learners should learn to realize the problem by focusing on the process of language production rather than studying only the language that is fixed in a constant situation (O'Donnell, 1999) such as a script of table reservation in a text.

2.3.3 Language Competency

Learning language is the process of making meaning (i.e. it is a semiotic process), and it is a form of learning of all humans (Halliday, 1993). The semiotic process is a fundamental of knowledge construction because every experience of a human life is derived from meaning making process. The importance of language competence is not the notion of knowing about the language, but it is the ability of organizing signs to convey meanings as intended. To be able to process a language, Grace noted that it is essential to know 'how to talk about the subject matter of which our effective worlds are constituted' (cited in Pawley, 1986, p.58). This means that language learners need to know the way to use a language for interaction in order to accomplish their goals. This knowledge derives from two concepts: the concept of the linguistic sign and the concept of its context so as to be able to make meanings. These two concepts are integrated when a human process a language as stated by Halliday that 'Language comes to life only when functioning in some environment. We do not

experience language in isolation... but always in relation to a scenario, some background of persons and actions and events from which the things which are said derive meaning' (cited in Hoffman and McCully, 1984, p.41).

From the aspect of linguistics, Chomsky (1965) strongly claimed that grammar or linguistic competence is the most important component for language competence. This idea was rejected by many scholars who consider that to be competent in using a language, knowing only the grammar-lexicon is not sufficient (Hymes, 1972; Salzinger, 1975; Savignon, 1976; Bourdieu, 1983; Pawley, 1986). Hymes was the first scholar who gave an explicit definition of the term 'communicative competence'; and suggests sociolinguistic perspective into the concept of competence (Celce-Murcia, Dörnyei, and Thurrell, 1995). He emphasized that language use and its context are correlated, and they cannot be separated by stating that 'It is not possible to pursue accountability of speech styles in abstraction from social context, and much of the interest, both in formal properties and in meaning, of speech styles may lie in the relations among social contexts, not in the relations of the linguistic features themselves' (Hymes, 1996, p.102).

Savignon defined communicative competence as 'the ability to function in a truly communicative setting – that is, in a dynamic exchange in which linguistic competence must adapt itself to the total informational input, both linguistic and paralinguistic, of one or more interlocutors' (Savignon, 1987, p.2). There are several linguists who try to make some contributions to the notion of communicative competence. Canale and Swain (1980) proposed a theoretical framework to categorize components of competence into three different types: grammatical competence, strategic competence, and sociocultural competence. Later in 1983 Canale added one

more competence to the model (i.e. discourse competence) (Canale, 1983). Ten years later Celce-Murcia, Dörnyei, and Thurrell (1995) agreed on this framework; but they made some minor changes. Their proposed model includes; linguistic competence, strategic competence, sociocultural competence, actional competence, and discourse competence (Celce-Murcia, Dörnyei, and Thurrell, 1995). This notion reflects the idea that the use of a language for effective communication associates many complex variables that are unable to be comprehended separately from their context.

2.3.4 Language Proficiency

Competence and performance are like two sides of a coin, they are both representative of a coin but stand on the opposite sides. They provide two perspectives of knowledge in which competence is the knowledge that is presented in a form of logical structures of content that learners should know (Salzinger, 1970). Whereas performance tells the missing content that learners should use when processing a language in a specific time and situation. These two concepts counterbalance each other, and both of them are necessary for learning assessment as Savignon (1997) noted that language competence can be observed through language performance, and it can be developed, maintained, and evaluated.

Proficiency is the term that Taylor (Taylor, 1988) used to emphasize on ‘the ability to use knowledge’ and differentiate it from competence which means ‘knowledge of’. Ability to use a language is like ability of all players in a football game as Savignon (1991) inferred that the importance of the game not on the ball, but the capability of all players who try to pass the ball by moving and using strategies. Everyone who is in the communication event or related to that action is participants as their roles are both senders and receivers for meaning negotiation. Language

performance is being discussed widely not only in the language field; it has been studied among behaviorists for decades. Kurt Salzinger, a psychologist, pointed out that efficiency of language producing involves the concept of stimuli and behavior (Salzinger, 1975). He emphasizes on the power of stimulus from environment which arouse language behavior by stating that ‘the normal redundancy of an utterance is usually strengthened by its redundancy with the environment, the past history of communication, the facial expression, other gestures, etc.’ (Salzinger, 1975, p.12). This is similar to Bourdieu’s notion as he believed that language competence and performance relate to social acceptance. He described that language competence is the result of social acceptance of the language used in a situation in a community (Bourdieu, 1991). Social acceptance of language performance, either positive or negative experience, will be kept as individual dispositions for generating language competence. This means that all experiences, both direct and indirect, do matter for meaning making. Thus, if a learner gets a punishment from making a mistake, it can affect his/her language competence; this experience also has an effect to his/her peers.

Language proficiency is the ability to use knowledge of the language in order to respond to a particular situation. Competence and proficiency are interrelated, and they operate congruently. Competence acts as a storehouse of language knowledge where the owner uses his/her proficiency to pull that knowledge to correspond to the social situation. Degree of proficiency is changeable according to situation, but its change will never go beyond the competence of its owner. Although proficiency can determine how competent the language learner is, there are a lot of factors that can affect effectiveness of language proficiency especially psychological factor which is critical for pedagogy of language learning. Bourdieu proposed an insightful concept

of self-censorship: it is like a process of self-adjustment in which an individual by observing a language used in an environment, produces the language according to social acceptance and evaluation of others (Bourdieu, 1983). The language user will choose appropriate words or change his/her language style suit to that situation or specific group of people. On the other hand, if one feels that his/her utterance (Bourdieu termed it as product) is not valued by people in that community, one can be 'lost for words, or not to know how to act in a particular context' (Lian, 2002). Furthermore, in traditional language teaching error-avoidance is dominant. When language learners make mistake they will get punishment that cause learning blockage and they cannot make use of error in their learning process. However, error or failure is essential for learning process. Savignon (1976) revealed that in modern French, verb 'error' means to explore, and it is useful for language learning in order to strengthen the system.

2.4 Learning Theories and Implication of Constructivism in Thailand

2.4.1 Learning Theories in Thailand

There are three main methodological approaches which have been practiced in learning and teaching in Thailand: behaviorism, cognitivism, and constructivism. Behaviorism determines learning result on performance changing. Successful learning in the sense of behaviorism means that learners can change their unwanted behavior to meet the expected performance. Behavioral method views stimulus and response as condition of learning; its approach begins with providing stimulus and observing learners' response. The focus of its implementation is on how to strengthen and maintain the proper response. In this regard, responsibility of the learning process is on

the teacher's hands, not the learners'. The role of learners in behaviorism seem to be passive not active.

The learning process in cognitivist approach is about processing and storing information. Knowledge in cognitivist perspective is tangible; it can be obtained, transferred, or acquired. Therefore, cognitivist researchers consider that information and/or content are important. Its implementation emphasizes on the process of input and output of information into the human brain, similar to a computer. Even though these two approaches (behaviorism and cognitivism) are about the learning process, but there are some critiques about their theories. Schunk (2012) stated that although behavioral method aims to develop learner's performance, personal thoughts, beliefs, and feelings are excluded when explaining the learning process. He also noted that cognitivism places more values on the learner's role; it tends to ignore social influences in the learning process (Schunk, 2012).

Constructivism derives from psychology and philosophy (Perkins, 1992); it is not a learning theory but a concept that integrates notions from different disciplines to study about knowledge construction. In the process of learning personalization and context are two main elements of knowledge construction (Bodner, 1986). Learners are active as Perkins (1992, p.49) argued that learners do 'not just responding to stimuli, as in the behaviorist rubric, but engaging, grappling, and seeking to make sense of things'. In the constructivist perspective, learners are the ones who take control of their own learning process as Marlowe and Page (2005, pp.7-9) summarized: 1) it's about constructing knowledge, not receiving it, 2) it's about thinking and analyzing, not accumulating and memorizing, 3) it's about understanding and applying, not repeating back, 4) it's about being active, not passive. In addition,

context becomes crucial for developing meaning making as Perkins (1999) explained that knowledge and understanding are social construction. Learners develop their understanding through feedbacks, and this process cannot be constructed solely apart from social interactions.

Therefore, the principle of constructivist method is about activating and supporting learners to construct their own knowledge through context. Socialization is important for knowledge construction as it helps casting and recasting meaning on the basis of the existing one.

2.4.2 Constructivist Approach in English Language Teaching in Thai Education

Thailand began to implement the constructivist approach after launching the educational reform in 1999. The latest Thai National Education Act of B.E.1999 states that:

“Education shall be based on the principle that all learners are capable of learning and self-development, and are regarded as being most important. The teaching-learning process shall aim at enabling the learners to develop themselves at their own pace and to the best of their potential” (p. 10).

Learner-centered concept has been promoted amongst Thai teachers for all levels of education since then. Thai teachers are trained about how to apply the concept of learner-centered with their teaching process under the principles of three educational theorists: Jerome Bruner, Jean Piaget, and Lev Vygotsky. The Ministry of Education suggested many teaching techniques for the concept of learner-centered approach: 1) questioning techniques, 2) problem-solving techniques, 3) problem-based instruction, 4)

generation of knowledge through constructivism, 5) promotion of constructive thinking, 6) project-based learning, 7) use of authentic experience, 8) integration of multi-intelligence units, and 9) use of learning sources (OEC, 2008).

According to the changes of the Act, English language teaching is reformed by adopting constructivist method, and applying them in the process of teaching beginning with decentralizing syllabus design, adding local cultural components, encouraging thinking skills, focusing on individual needs, adopting various educational approaches, promoting language education, and encouraging communicative language teaching methods (Darasawang, 2007). The constructivist paradigm has been implemented through integration of learner-centered and communicative language teaching approach, not only in primary and secondary level but also tertiary level. Although teachers of English incorporate the concept with their teaching practices as they are trained but the outcome of its implementation is still questionable.

A study by Teifu Zhang (2012) gave an explanation about the reason behind the failure. The study explores the language teaching beliefs of M.A. student teachers which revealed that there are unparallele issues between personal beliefs and external factors when they perform teaching practices in a private university in Thailand. Beliefs that were established from positive experiences acted as inspiration in their teaching which consisted of 1) using English in class, 2) valuing learning environment, and 3) emphasizing on particular skills. On contrary, negative effects from previous language learning experiences which resulted from grammar teaching method and examination based education system also influenced their teaching as these student teachers paid attention on error correction, especially grammar structure

and spelling errors. Their teaching practices contrasted with their responses that grammar should be taught indirectly. The study also found that some external factors can be obstacles for applying the constructivist approach in their teaching process, for example students' motivation, difficulties in classroom management, a lack of genuine English atmosphere, students' poor English skills, class size, examination stress, and rigid textbook. The study makes assumption that previous experience and contextual issues have great influences on language teaching practices.

Riabroi (2017) applied team-based learning into her course of translation in order to shift from traditional teaching style to emphasize more on the role of students responsible for their own learning. This was consistent with the student-centered learning approach. Her concept was underpinned by social constructivism which focused on promoting collaboration among 27 students who studied English in a Thai university. She also integrated simulation method into her implementation by dividing students into groups and assigning them as translator, editor, terminologist, document researcher, and project manager to work as a team. There were seven research instruments including pre-tests, post-tests, reflective journals, peer feedback, observation, questionnaire, and interview. The findings showed that English competency of her students developed in the area of English translation skill on both individual and team levels. In addition, they were better in problem-solving and self-monitoring skills. They demonstrated more skills on leadership, communication, and negotiation. Their skills of using resources and tools for translation process were also developed. Moreover, the students were more aware of translation process in the real world. The results from her observation revealed that this team-based learning approach with role simulation was meaningful to her students' learning process. The

students gained more positive attitudes to this approach especially in helping promoting their motivation in their learning process. In conclusion, team-based learning integrated with professional role simulation helped increased students learning process of English translation through working collaboratively among their peers.

Based on the findings of the above research studies, it is apparent that there is an urgent need to introduce new learning platforms/environments that may encourage more EFL teachers to effectively apply the constructivism paradigm into their English language teaching.

2.4.3 Macrosimulation in Language Pedagogy

Simulation is widely used in various fields; education, military, or industry (Lebow and Walter, 1994) in order to give participants practice in applying knowledge to solve problems in a mimic of real situations by taking on the role of others. Garvey & Garvey (1967) defined simulation as 'an artificial situation which reproduces in essential details either a model of an actual situation or a model which depicts a hypothetical situation' (p.11). In addition, he asserted that simulation can help learners to improve critical skills such as comprehension, application, analysis, synthesis, and evaluations. Simulation is a combination of two parts: role-play and social process (Alley, 1974). The term role-play is a related keyword of simulation as it helps learners to experience a situation in the role of an assumed person. Then, social process is another part of simulation that fosters learners to think and act in order to respond to their environment through the role. In the simulation approach, learners are the controllers of their own learning process, and it is a tool of learner-centered method in which learners try to solve problems by using their own knowledge

(Hawley and Duffy, 1998). Jones (1998) described simulation as an experiential learning that is not programmed learning or a rehearsed event. Mistakes are acceptable in a simulation so that learners can improve themselves and get another chance to try again (Jones, 1995).

Macrosimulation is a long-term collaborative activity for language learning in a simulated context that enables learners to use a target language at their own pace and at their own level in their own way, to act upon their chosen roles (Lian & Mestre, 1985; Lian, 2000; Moore & Lian, 2013). It was first applied with a French class by Lian and Mestre (1985) for university students in Australia. Ten years later, this concept of language learning and teaching was implemented by Yaiche, and he termed it 'simulation globale' (cited in Moore and Lian, 2013) or in English it is called 'global simulation' (Lavine, 2004). It is broadly applied to French learning in several studies; this technique is also adopted by teachers of other languages such as German, Italian, and English (Fischer, 2006) or in other disciplines such as political science (Bostock, 2008). Lian and Mestre described that their project lasted for more than two semesters, and the result showed significant collaboration of all students in the class. The study attempted to encourage language learners to practice the target language by having them simulate their selected roles in a French village. The last scene of a French village mayor having a meeting with Madame Rosalie who sent a letter to ask for joining in a club of the village is described as a sample situation. After having an interaction of the simulated roles, learners and teacher were together viewed the recorded situation for making comments. Learners had feedback from their peers and teachers (personal communication, July 28, 2016). Here are some results of the experiment from the analysis of five and a half minutes of the conversation. It showed

that learners were not being passive or quiet; rather they were active and tried to participate in the talk as there were high rates of interruptions and interjections. The conversation went naturally; in some cases other students used sentence-completion strategies to fill up incomplete sentences of their peers in order to continue the conversation. Language functions were used diversely, and the results disclosed that seven types of language functions were employed: expressing disapproval, enquiring, introducing a subject, explaining intention, expressing certainty, expressing obligation, and expressing indispensability. Students were more intentional and had to think carefully about what they wanted to say with their peers as the conversation did not allow them any preparation in advance (Moore & Lian, 2013).

The concept of macrosimulation is to encourage learners to speak in a series of talk that occur realistically as the topic is just roughly set out. The interaction goes naturally because the learners had to think about what to say while paying attention to listen to their interlocutor in order to continue the conversation. It is not like a role-play activity in which the learner recites a preset text as conversation and then produces sentences following the text without any thinking or creating their own sentences. Macrosimulation gives students more time to think and practice conversing authentically at their levels of ability, and also it gives more opportunities for students to be exposed to the target language. Learners will be progressive in the target language with confidence without any pressure because they speak as their will when they are ready. Macrosimulation works as a catalyst to generate needs of the learners; it is a situation where learners' needs emerged because of the collision between learners' ability and the tasks. It stimulates them to practice meaning-mechanism without structure and syllabus, but with one purpose: which they have to work

collaboratively to make the situation carry on. There is no reward or punishment for the task, so learners are relaxed in a blame-free learning environment.

In summary, this long-term language learning activity can help learners to overcome some barriers of communication such as anxiety (Bostock, 1999). It also gives freedom and power to learners to control their learning processes (Moore & Lian, 2013). It allows learners to think and perform through their imaginary roles in order to be functional in that context. Learners have opportunities to use their knowledge to react to imitated situations to test their understanding, and they can get instant feedback from context for confirming or cancelling their previous knowledge. Lian (2000, 2004), proposed that a proper learning environment should be a place where learners can use their meaning-making mechanism to ‘confront, contrast, and contest’. It is a place where learners’ needs emerged when they fail to use their knowledge to accomplish the task. Two essential elements that Macrosimulation have are its prolonged engagement and target language exposure which correspond well with CLT practices. Richards and Rodgers (2014) described that learning activities should be implemented ‘according to how well they engage the learner in meaningful and authentic language use (rather than merely mechanical practice of language patterns)’ (Richards & Rodgers, 2014, p.72).

2.4.4 Previous Study Related to Macrosimulation in Language Learning

Macrosimulation or Global Simulation (GS) approaches are different from role-play technique which Thomé-Williams categorized in the table below (Thomé-Williams, 2010).

Table 2.1 Differences of Role-play Technique and Global Simulation Approach in Language Teaching

Role Play (Livingstone, 1983; Shaw, Corsini, Blake, & Mouton, 1980)	Global Simulation (Debyser, 1980; Caré et al., 1992; Yaiche, 1996)
Main goal: Practice of given structures (grammar, vocabulary, functional items, and linguistic expressions).	Main goal: Emphasis on effective and spontaneous communication.
Duration: Short, in general, a simple dialogue.	Duration: Variable, it depends on the accomplishment of tasks: it can take one class session or the whole semester/quarter.
Students: They follow instructions and roles determined by the teacher. They interact according to pre-arranged schemes.	Students: They perform roles that they create. They imagine schemes for interaction with the other characters.

Thomé-Williams (2010) employed the Global Simulation approach in her teaching of Portuguese intermediate course to five American university students for ten weeks. The course was online on the Moodle platform which was offered by the university. Students could use several online tools such as forums, blogs, chats, and emails to communicate to each other. Her implementation of the Global Simulation approach had four steps: arranging the setting, creating the story, accomplishing the tasks, and evaluating. First, she let her students decide the scenario of the simulation, and they chose Rio de Janeiro city. They also chose to stay together in the same apartments and they named it as 'Rio das Ondas'. Then, these five students created their own characters in details (gender, age, marital status, occupation, character, residential details, etc.) and agreed to simulate in their selected roles together. This online class was conducted three times a week. Students spent their time to interact and do activities together such as watching online TV news, soap operas, and talk show. After that they had to share their opinions regarding these activities orally or in writing. Thomé-Williams stimulated students to have more interaction by adding cultural task assignment during the course, for example the first task was about

getting to know each other. They had to leave a note in their neighbors' mailbox to invite them for a visit, to complain, to comment, or asking question. They had to reply those letters and continued the simulation. Along those ten weeks, students were assigned to do many activities that required them to use the target language. The last assignment was about writing; they all were required to write an essay for a reunion of their own neighbors 20 years later. The study results demonstrated that students were autonomous in accomplishing those tasks on their own, and all students commented positively on this teaching approach. The researcher concluded her study with three advantages of Global Simulation as follow:

- 1) Global Simulation approach gives students the real sense of using the target language in different contexts. Students use the language appropriately with different interlocutors (e.g. talking to a stranger and talking to a friend). They produced the language intentionally, not just for grading.
- 2) Students learn the structure of the language on their own from functional perspective. They study grammar at the time they use the language for communicating.
- 3) Global Simulation provides freedom of self-expression; it reduces students' anxiety while using the language. Students tend to be immersive in their selected characters and more relaxed to learn the language in another culture. In conclusion, the above-discussed research shows that Macrosimulation can effectively promote L2 learning.

2.4.5 Assessment of Language Knowledge

Assessment is a tool for constructing knowledge; it assists learners in optimizing and adjusting knowledge for their understanding. Erwin (1991, p.15) defined assessment as 'the systematic basis for making inferences about the learning and development of students. More specifically, assessment is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to

increase students' learning and development'. Therefore, the main purpose of applying an assessment is for developing the learning process, rather than to judge or evaluate its product. There are two main instruments that are largely used for assessing learning in Thai education: summative and formative assessments. Explicitly, the most influential one is summative assessment (e.g. multiple-choice design with one right answer) (Watson Todd, 2015). Summative assessment function is inconsistent with the notion of knowledge construction as learning is an ongoing process that is dynamic and continuous. It can catch only a 'single snapshot of the learning process' (Vey, 2005) that meets predetermined learning objectives of an authority. To be more specific, summative assessment can assess only knowledge quantitatively; as a result, the qualitative value of knowledge construction is neglected.

Formative assessment can assist learners to improve learning performances. It gives chances for learners to modify their construction of knowledge, and then they can make another attempt to recheck their understanding. Formative assessment suits the constructivist paradigm as it focuses on the learning process rather than its product. It tells learner where and how to improve their performances: it is vital to the learning process as learners use it for making sense of every experience. Therefore, its validity and fairness should be the most important elements because it is a tool that learners need to rely on to confirm their strengths or amend their weaknesses. In fact, learners are the ones who get benefit from its results in order to make improvement in their learning. However, a meta-analysis of classroom formative assessment by Black and Wiliam (1998) disclosed that the teachers tend to assess shallow knowledge that learners can recall from short-term memory. The assessments are created by the

teachers solely without reviewing from others who are related in the field, and this shows that their assessments may have inequality. Those assessments are mostly used for grading, not for improving the learning process. Moreover, a normative approach is adopted instead of a criterion-based approach and this causes competition amongst learners. It was found that with this approach learners get stressed and it destroys learners' confidence to learn (Black and Wiliam, 1998). Formative assessment can be done by giving feedback. Shute (2007) defined formative feedback as a representation of 'information communicated to the learner that is intended to modify the learner's thinking or behavior for the purpose of improving learning' (p.i). In order to promote effective practices in learning and teaching, the SENLEF project (Student Enhanced Learning through Effective Feedback) proposed seven principles of good feedback practice as below (LTSN, 2004, p.2):

1. Facilitates the development of self-assessment (reflection) in learning.
2. Encourages teacher and peer dialogue around learning.
3. Help clarify what good performance is (goals, criteria, expected standards).
4. Provides opportunities to close the gap between current and desired performance.
5. Delivers high quality information to students about their learning.
6. Encourages positive motivational beliefs and self-esteem.
7. Provides information to teachers that can be used to help shape the teaching.

Crooks (1988) studied about the effects of teachers' practices of classroom evaluation on learners by synthesizing several studies from 14 related fields. He summarized that there are three ways to deliver effective feedback. First, the most effective feedback is the one that points directly to learners' progression on the tasks. It helps learners gaining more self-efficacy, stimulates them to try again, and conveys them to pay more attention on their performances of the tasks without a feeling of

being in competition with others. Second, giving feedback should be done right after learners have finished the tasks, and teachers should offer them to try again without punishment. Third, giving feedback should be based on related and essential information that those learners' need in order to assist them to correct their misunderstanding. Praising should be used carefully and specifically relevant to the tasks; remember that criticism can cause unproductive learning (Crooks, 1988). In language pedagogy, both types of assessment (i.e. summative and formative) are useful for learning process in which they should be blended on the basis of promoting learner's ability to learn. Crooks (1988) concluded that learners are the ones who receive direct effects of feedbacks by any type of assessment, both negative and positive ones. Therefore, assessors should think thoroughly about its impacts, and it should be well-planned before implementing.

In order to achieve the purposes of the present study in promoting English language learning process, a formative assessment will be used to assess learners' performance and instant feedbacks will be given to the participants immediately after the assessment process. These feedbacks are focused on their performance with related information in order to notify them of their needs and encourage them to continue their process of learning without judging or criticism. Mistakes are considered as learning needs and teachers offer to help by suggesting and/or providing resources or providing mental support to help them in fulfilling their needs.

2.4.6 Constructive Evaluation for Learning

Evaluation is embedded in our daily life practices on the basis of judging something in order to make decision about it. It has been implemented in many fields such as in management sciences and in both public and business sector. It is used for

making decisions about budgets, human resources, or projects. Recently, evaluation is also applied for ensuring accountability of an organization. It has many forms, depending on the requirement of each field, for example performance appraisal, quality assurance, and customer satisfaction survey. Formal evaluation in education can be traced back in the mid of 18th century in the U.S.A. In order to assess the quality of the school operation, students in Boston were examined on their learning by comprehensive tests of various subjects (Hogan, 2007). This model of judging performance of school or program by using students' test scores started to proliferate as educational evaluation since then (Stufflebeam, Madaus, & Kellaghan, 2000). Testing is commonly recognized as an assessment method to evaluate the outcome of learning process, and it is constructed according to learning objectives i.e. objectives-oriented evaluation (Alkin & Christie, 2004). Objectives-oriented evaluation was first introduced in 1932 by Ralph Tyler, the father of educational evaluation, by focusing on establishing learning objectives and measuring them with learning outcomes (Hogan, 2007). He defined evaluation as 'The process of determining to what extent the educational objectives are actually being realized' (Tyler, 1950, p.69). His approach is the most widespread model for learning evaluation in Thailand, but there are some critics in its operation.

Tyler proposed that learning objectives should be specified with behavioral terms, but Stufflebeam and Shinklefield (1985) pointed out that some learning objectives are unable to assess practically. Basically, the process of evaluation requires value-free and unbiased information. In contrast, determining learning goals by others, not the learners themselves is obviously biased because of subjective interpretations. That is not to say that objectives-oriented evaluation is not good for

evaluating learning process, but it has some limitations as many theorists suggested that this approach often overlooks some learning values that are not pre-defined (Scriven, 1972; Worthen and Sanders, 1987). Daniel L. Stufflebeam also revealed that to write about learning objectives is an abstract activity which teachers set as goals in advance without knowing their students' needs (cited in Brandt, 1978). Guba and Lincoln (cited in Worthen, 1990) gave some critiques of this approach as its implementation pays no attention to the authentic essence of evaluation (emphasizing on measuring things according to its objectives instead of considering the real performance). There are no criteria to determine level of performance towards its objectives, its results adhere to the doctrine of utilitarianism, it devalues diversity, and it limits multiple-perspectives in practices.

After the decline of Tyler's approach, program evaluation has developed in order to consider the effectiveness for educational funds by the government (Worthen, 1990; Owston, 2008). Worthen further described about program evaluation that it 'consists of those activities undertaken to judge the worth or utility of a program (or alternative programs) in improving some specified aspect of an educational system' (Worthen, 1990, p.42). To provide accountability, value judgment is the most critical issue, and Michael Scriven was an outstanding evaluator in this field (Alkin and Christie, 2004). His principle of evaluation is not restricted only to decision makers such as clients, users, or stakeholders, but evaluated information should serve as a primary source of judging process for public interest as well. He defined evaluation as 'Evaluation refers to the process of determining the merit, worth or value of something; or the product of that process' (Scriven, 2007, p.1). Moreover, Scriven has made a great contribution to the field of educational evaluation. He offered 'goal-free

evaluation' which can reveal both intended outcomes as specified in objectives and unintended outcomes which are not indicated. Scriven viewed that goals are for management and planning which are not relevant for evaluation. He even suggested that the evaluator should avoid being notified about stated objectives (Owston, 2008) because ignoring objectives can make evaluators see the real effects that are caused by the process (Evers, 1975). In conclusion, evaluation should be done on the basis of the features of that thing, not on the expectation of someone's thinking. The effective educational evaluation should not only present information of the goal attainment but also on what effects that the process does to the learners.

From the overall reviews of evaluation, it is clear that evaluation is not for judging one's learning progress and presents it as a grade. Evaluation aims to reveal the effects of the whole process (both positive and negative sides) and presents the evident results for the purpose of improvement of the process. Therefore, this study applies evaluation as an assessment of the course effectiveness in order to improve it, not for giving grades of learners' learning.

2.5 Autonomous Language Learners

Learning process in this century is not different from the previous one, but with the power of technology it explicitly accelerates its process. Technology upgrades everything (e.g. data, audio, visual) to be speedier, and humans cannot resist it as Ray Kurzweil (2005, p.8) mentions that:

“within several decades information based technologies will encompass all human knowledge and proficiency, ultimately including the pattern-recognition powers, problem-solving skills, and emotional

and moral intelligence of the human brain itself.”

The process of learning for this generation seems to differ from those of learners 30 years ago because today’s learners have different mindset of the world from their predecessors. Kurzweil (2005) writes clearly in his book ‘The Singularity Is Near’ that the growth of technology is rapid but hard to recognize: ‘It starts out almost imperceptibly and then explodes with unexpected fury—unexpected, that is, if one does not take care to follow its trajectory’ (p.8). What technology draws us to be is less important than how we will be if we are not proficient enough. Therefore, what characteristics of learners and teachers in this century should have in order to be capable in their roles are interesting points to consider. Interestingly, Lian and Mestre (1985) described the teacher-learner relationship in their article thirty years ago, but it is still coherent with the situation. They said:

It seems desirable to change the teacher-learner relationship in the following ways:

- (a) By providing students with a learning model which does not demand that they conform to a specific pedagogic model in order to achieve success.
- (b) By bringing about a change in the teachers’ attitudes as they ought no longer to be the focus of attention. The teacher’s task would now become one of providing sympathetic assistance and support. Their first priority would be to assist students to determine their needs (which are not necessarily those of more traditional models) as well as a realistic self-assessment of their abilities.
- (c) Students, on the other hand, should be encouraged to break away from their total reliance on teachers and learn to focus their learning capacities upon themselves thus taking a giant step toward autonomy.

Obviously, their idea is quite consistent with the learner-centered approach, and they emphasized more about learning autonomy when they concluded that:

‘Shifting students’ responsibilities onto themselves does not mean abandoning them to their own devices. Rather, it is a question of helping them to develop learning structures which will allow them to take full advantage of whatever personal and pedagogic resources are currently available’ (Lian and Mestre, 1985). For constructive learning method, learners should be trained to be proficient enough to control their learning system for making sense of the world.

2.5.1 Importance of Learning Autonomy

In the context of constructivist learning, learners construct their own knowledge from experiences that they sense the world. This is in contrast with the objectivist paradigm as Driscoll exemplified that learners are seen as ‘empty vessels waiting to be filled, but rather active organisms seeking meaning’ (Driscoll, 2005, p.387). In addition, with the huge influence of technology that affects everyone’s life, including how to learn, learners should be proficient enough to use the most powerful instruments to support their own learning process, on their own time, at their own pace, and for their own purposes. Therefore, learning autonomy is the most essential ability for learners that could help them get through the process effectively. Autonomy derives from Greek words ‘autós’ which means ‘self’ and ‘nomos’ which means ‘law’ or ‘rule’. The term was first applied with city states in Greece which are administered by their own laws (Kühler & Jelinek, 2013). In a political sense, Darwall (2006) defines autonomy as ‘a capacity persons have to impose demands that are rooted in the authority of free and rational wills as such and thus in no value outside the will’ (p.264). In contrast, a heteronomous person is one who is unable to decide to do things as her/his will because of extrinsic and intrinsic barriers. Extrinsic barriers include interference of others who intentionally or unintentionally obstruct authority

of decision making. Intrinsic barrier is some psychological health problems that interrupt that person to make decision (Darwall, 2006).

Autonomy in education is seen as freedom of determination on ones' own learning. For Piaget, autonomy is the aim of education. He stated that it is 'to create individuals capable of intellectual and moral autonomy and of respecting this autonomy in others' (Piaget, 1973, p.91). Autonomy in his sense does not mean just being free to do whatever one wants to do, but educated people have to be considerate and respect others' autonomy as well. Even though learning is a natural process of human; autonomous learning is not naturally acquired; it develops from nurturing environments (Kamii, 1984). Kamii explained that autonomy is the opposite of heteronomy; babies are born with completely heteronomy and totally need external assistance (Kamii, 1984). The development of autonomy relates to age and nurture, although babies become less heteronomous when getting older, but not all adults will be completely autonomous. Its variation is caused by many factors from its nurturing; therefore, education is very crucial for fostering autonomy. In the biological process, autonomy is 'the fundamental feature that characterizes living systems' (Maturana, 1999, p.1). It means that all humans are autonomous. Maturana and Varela proposed the autopoietic theory, a theory of self-organization, as a system of all living things (Maturana and Varela, 1980). In their concept, autonomy is the product of an autopoietic system (self-producing system) which 'is a network of component-producing processes with the property that the interactions between the components generate the very same network of processes that produced them' (Beer, 2004, p.310). In conclusion, all humans are autonomous and this features as a self-organization of their own autonomy. However, the level of autonomy differs due

to their nurturing environments; that is to say learning autonomy needs process and time to develop.

Maturana and Varela's concept of autopoiesis helps in defining the characteristics of a living system (Hall, 2005). It is a dynamic structure determined system in which 'nothing external to a living system can specify what happens in it; all that an observer sees as external to a living system can only trigger in it structural changes that are determined in it' (Maturana, 2002, p.12). At this point Mingers elaborated that 'the changes of state that its structure goes through – are determined by its own structure' (Mingers, 1991, p.320). External forces can be only as a trigger not a reason of those changes. Therefore, learning is an individual process and behavior changes are unique due to the nervous system's structure of each person (Kay, 2003). Human behavior changes can be described as learning. It is consistent with the explanation of autopoietic theory which reveals that 'Ontogeny is the history of structural changes in a particular living being' (Maturana and Varela, 1992, p.95). Moreover, the nervous system is a plastic structure, and it is changeable over time according to structural coupling with other plastic systems (i.e. medium or organism). This process is essential for developing ontogenic adaptation; the more they have interactions the greater results on sequential changes (Maturana, 1999). In the education field, autopoiesis is adopted to describe the cognitive notion which is an interdisciplinary convergence that provides an insightful perspective to the learning process. The autopoietic concept gives a clear explanation about the process of learning which reveals the reasons behind the term 'learner-centered', and provides a guideline to language pedagogy in order to foster learning autonomy in constructivist learning environment.

Autonomy of learning is not a skill that can be trained or taught but it is a product of autopoiesis system which is developed by self-regulation. Learning system is naturally controlled by biological and neural system to enforce the organism to interact with its environment. The system is strengthened by frequency of interaction: the more learners interact, the more they gain synapses, while the less the connection, the less learning. Therefore, in this study learners are offered opportunities to apply their meaning-making mechanism as much as possible to construct meanings and strengthen their structure through their direct experience. Also, they are able to sequence their own learning process according to their learning system without interference by the teacher.

2.5.2 Roles of Language Learners in Constructivist Learning Environment

From what Lian and Mestre (1985) describe about the roles of learner and teacher above, apparently their roles are swapping from the traditional teaching style. Learner is active, and teacher is passive. The teacher's role is a counselor who gives answer to learners' inquiries. Learner is the one who holds the steering to control his/her ship to the destination of knowledge that they want to go. In constructivist learning environment, learners are the controllers of their own learning process. Airasian and Walsh (1997) explained that learners should:

- 1) learn new ways to perform
- 2) learn to think for themselves, not wait for the teacher to tell them what to think
- 3) proceed with less focus and direction from the teacher, not to wait for explicit teacher directions
- 4) express their own ideas clearly in their own words, not to answer restricted response questions

- 5) revisit and revise construction, not to move immediately on the next concept of idea

Advancement of technology has greatly influenced learning behavior in this century. The eight trends of (language -) learning for learners in 21st century that Lian (2011) introduced are still applicable. Additionally, the key person in the learning process is the learners themselves. So what are the characteristics that could help them in the process? Lucy Cooker made a list of language learning autonomy which includes thirty three constitutive elements in seven categories as shown in the table below (Cooke, 2012).

Table 2.2 Constitutive Elements of Language Learning Autonomy (Cooke, 2012)

Category of Learner Autonomy	Constitutive Elements	Category of Learner Autonomy	Constitutive Elements
Learner control	1) Ability to analyse/define needs 2) Ability to set achievable objectives 3) Ability to manage time 4) Ability to choose appropriate materials 5) Ability to negotiate learning 6) Ability to select partners for pair/group work 7) Ability to work on one's own 8) Ability to make choices about how work will be assessed 9) Ability to assess discrete aspects of one's own work 10) Ability to assess the work of peers 11) Ability to take responsibility for one's own learning outside the classroom 12) Ability to monitor one's own learning progress over time	Metacognitive awareness	1) Ability to provide a rationale for materials chosen 2) Ability to select appropriate learning strategies 3) Ability to select and reject strategies according to needs 4) Ability to describe the strategies used 5) Ability to provide a rationale for the strategies used 6) Ability to provide an evaluation of the strategies used 7) Ability to describe alternative strategies that could have been used 8) Ability to describe plans for future learning
Critical reflection	1) Critical understanding of the roles of teacher and learner 2) Critical awareness of different teaching and learning approaches 3) Critical awareness of the variations in quality of different teaching and learning inputs	Learning range	1) Flexibility in ways of learning 2) Awareness of breadth of learning content 3) Ability to seek support from other students and teachers 4) Ability to collaborate with other students and teachers

Table 2.2 (continued)

Category of Learner Autonomy	Constitutive Elements	Category of Learner Autonomy	Constitutive Elements
Motivation	1) Desire to learn 2) Willingness to speak/use the language 3) Willingness to be actively engaged in learning activities	Confidence	1) Ability to seek out opportunities to speak/use the language 2) Ability to overcome negative feedback/assessment
Information literacy	1) Ability to source and navigate learning resources		

2.5.3 Roles of Language Teacher in Constructivist Learning Environment

Once learner is the navigator of his/her own learning process, then the role of teacher is that of a compass for the journey. Kenneth Tobin (cited in Lebow, 1993) expressed that the teacher's role is not to control the learning process, but acts as a supporter to help learners make a link of their understanding with their prospective knowledge. Being as a good guide is hard and tough work because the teacher needs to know what resource would fit the learner's needs in order to help him/her to construct his/her own knowledge. Airasian and Walsh (1997) pointed out that the roles of constructivist teacher should:

- 1) guide, not to tell
- 2) create environment in which students can make their own meanings, not be handed them by the teacher
- 3) accept diversity in construction, not search for the one "right" answer
- 4) modify prior notions of "right" and "wrong", not stick to rigid standards and criteria
- 5) create a safe, free, responsive environment that encourages disclosure of student construction, not a closed, judgmental system

The role of a teacher seems to be less important than before because teachers do not take the main role of the process. They are not there for teaching, instructing,

or directing anymore. In constructivist implications, teachers are the most essential factor who can organize the learning environment to support the learning process of each learner. Fosnot explained about teacher's roles in constructivism: 'We can only facilitate "coupling" with problematic situations, help raise questions and puzzlements, and support discourse and development' (Fosnot, 2005, p.5). She also explained about the learning process: 'is about self-organizing at moments of criticality' (Fosnot, 2005, p.5) which means that learning depends on a system of interpretation of each individual, and it does not take place at a shallow depth. The process of learning is complex and does not have a clear step because it is the product of self-interpretation from experiences of one's life (Fosnot, 2005).

2.6 Learning Environment in the 21st Century

To realize how technology impacts on knowledge construction, Lyotard (1984, p.44) defined technology as human assistance in 'maximizing output (the information or modification obtained) and minimizing input (the energy expended in the process)'. Its principle is to help humans do things better with less effort. Consequently, in the aspect of knowledge construction, easiness conquers the truth such as the effect of proliferation of search engine. The Google effect and digital amnesia are the new terms for this generation in which learners tend to base their trust on information from the internet. A study by Kaspersky Lab concludes that people rely heavily on their digital devices, and use them as online brain extensions (Kaspersky Lab, 2015). Learners in this era need a different way to deal with information which totally affects their learning process. Hence, some successful methods in the past may not be appropriate to the situation nowadays.

2.6.1 Personal Learning Environments (PLEs)

Personal learning environments (PLEs) are intangible spaces in which learners integrate many tools as learning resource to support their own learning process, both online and offline. Learning tools can be both human (i.e. teachers, peers, parents, neighbors) and non-human (i.e. textbooks, dictionaries, TV programs, internet resources). These learning tools are structured according to the learning process of each individual. Learning spaces are individually constructed on the basis of learning needs and accessibility of resources. Its structure is flexible due to the need of fulfilling inquiries; therefore its organizing is personally driven and free from time. Time does not matter to learning, the learning process will continue if needs have not been fulfilled. At this point, the role of teacher is essential to personal learning environment because teacher is the one who facilitate learning resources as learning experiences for learners. Learners construct knowledge by making sense from learning experiences which means that knowledge is constructed from available learning resources in their PLEs. However, the theory of autopoiesis gives a clear explanation that humans are structure determined systems in which change is determined by the structure itself, and its environment is just a trigger to the change. More precisely, 'any content provided within the 'learning space' should only be considered as a trigger agent for the student's learning' (Kay, 2003, p.431). Teachers should bear in mind that meaning can be created by many methods so that not all learners can develop the same meanings from the same source.

Personal learning environment should be a place where learners can use their meaning-making mechanism to exercise their 3Cs: confront, contrast, and contest with their previous understanding. Lian (2001) suggested that these three elements

can help learners to develop understanding of what they are learning. So, a learning environment should provide an opportunity to enable these three conditions to arouse the occurrence of learning process. There are many suggestions from constructivist scholars about the principles of constructivist learning conditions and Driscoll (2005, p.393) synthesized them as:

- 1) Embed learning in complex, realistic, and relevant environments
- 2) Provide for social negotiation as an integral part of learning
- 3) Support multiple perspectives and the use of multiple modes of representation
- 4) Encourage ownership in learning
- 5) Nurture self-awareness of the knowledge construction process

Additionally, the 3Cs should be promoted to help learners be able to identify their real needs of each experience in real context because context is the key for optimizing knowledge. A learning environment is the structured context that learners need to rely on to make meaning about things around them stated by Bourdieu: 'structured structures predisposed to function as structuring structures' (Bourdieu, 1990, p.53). Therefore, the quality of the learning process depends on the learning environment. From Bourdieu's suggestion, it could be inferred that vulnerable structures need stable structures to support their growth; hence, so the weaker structure tends to grow in the same direction as the stronger ones. To emphasize this point, learning activities should be organized in order to encourage learners to know how to take advantage from their context: to be able to use surrounding resources as supporters, and conform to the rules in order to be accepted.

2.6.2 Self-Organized Learning Environments (SOLEs)

Self-Organized Learning Environments are learning models that derive from Sugata Mitra's project: the 'Hole in the Wall' (Mitra, 2015; Mitra, 2016). The Hole in the Wall experiment was first implemented in 1999 with disadvantaged children in a slum of New Delhi, India. Mitra developed an outdoor computer kiosk with internet connection with a hidden camera. The researcher found that curiosity and fearless attitudes of the children made them want to learn even though they did not have any teachers, supervisors, or trainers for consultation (Dolan et al., 2013). At first, those slum children did not know what this machine was used for, but eight hours later they were able to use the computer for gaming, painting, and browsing the internet for information (Mitra, 2007; Inamdar and Kulkarni, 2007; Farris, 2013). While the children were using the computer, some of them were teaching their peers how to use it. The researcher found that there were no adults involved in using the machine, even though they showed curiosity from a distance (Arredondo, 2015). He repeated his experiment again in a remote area: 300 miles from New Delhi, set up a computer with a lot of CDs (no internet connection because of inaccessibility) and came back a few months later (Mitra, 2007; Farris, 2013). On that day, he found that a lot of children had gathered around the kiosk and were using the computer. Then, they asked him for a faster processor and a better mouse. He asked them: 'How do you understand what's going on over there?'. They said 'You've given us a machine that works only in English, so we had to teach ourselves English in order to use it' (Mitra, 2007; Farris, 2013). In that village, there was no English teacher, so these children had never been taught English at all. Yet the researcher found that these children were using 200 English words with their peers in daily life. Those words were related to the using of

computer such as exit, stop, find, save, etc. Although there were some mispronounced but they could use these words accurately (Mitra, 2007). The researcher repeated the experiment around 20 times all over India for five years, and he concluded that groups of 6 – 13 years old children are able to self-instruct and teach their peers without intervention from adults (Mitra, 2007; Inamdar and Kulkarni, 2007; Farris, 2013). Not only did their computer literacy skill improved, but children who participated in this project also developed other competencies as shown in the research findings (Hole-in-the-Wall, 2016).

Other than the knowledge construction domain, Mitra (2016) also did a sociometric survey to find out learning patterns and the result showed that the organization of these children can be divided into three groups; Leaders (experts), Connectors, and Novice (Hole-in-the-Wall, 2016). Leaders and Connectors have skills of connecting and teaching whereas the Connector of each group is linked together as ‘multiplier effect in learning’. Mitra (2007) explained that the multiplier effect enabled these children to organize themselves as a group, and one person will take control of operating the computer while the others were giving advice on how to use it. That was the way these children learned collaboratively: ‘they learned as much by watching as they learn by doing’ (Mitra, 2007). The role of the Connector always went to girls who connected younger children or their siblings to the leaders of the group (Hole-in-the-wall, 2016).

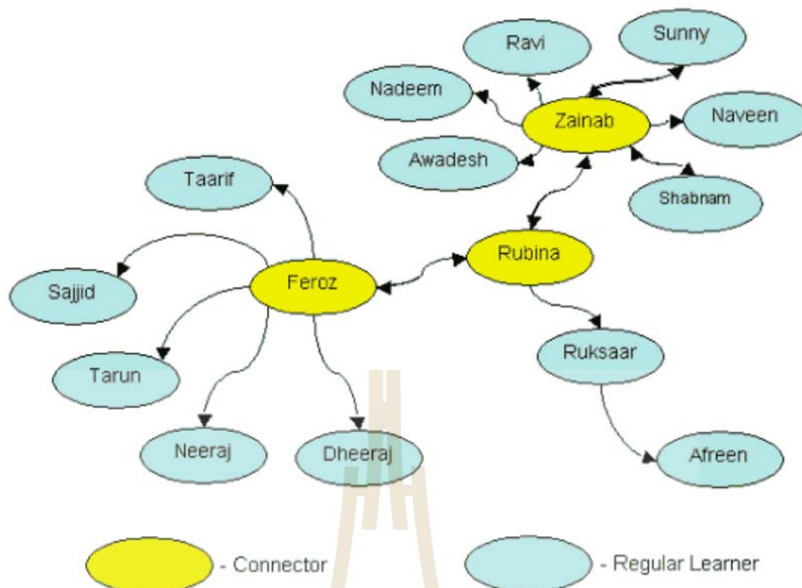


Figure 2.1 Representation of the Flow of information for a Specific Group of Children at a Learning Station (Hole-in-the-wall, 2016)

Mitra concluded that his six year project was ‘An educational technology and pedagogy that is digital, automatic, fault-tolerant, minimally invasive, connected, and self-organized’ (Mitra, 2007).

Self-Organized Learning Environments (SOLEs) are inspired by the result of ‘hole in the wall’ experiments which showed that children have the ability of self-instruction in learning to use computer by collaborating with a small group of their friends without any intervention from teachers (Dolan et al., 2013). SOLEs are developed under Mitra’s principle of education as ‘Education is a self-organizing system, where learning is an emergent phenomenon’ (Mitra, 2015). SOLEs are implemented with primary school children to facilitate self-organized learning. Children will be grouped into teams of four of their own choosing with one computer that they can use for searching information from the internet to answer questions (Mitra and Dangwal, 2010; Leinonen and Durall, 2013). Those open-ended questions

are from GCSE papers such as ‘Who built the pyramids and why?’, ‘What are fractals?’, ‘Who is Gandhi and what did he do?’, and ‘Where is Botswana and what is it famous for?’ (Dolan et al., 2013). SOLE sessions in the classroom range from 30 - 90 minutes with three sections: question, investigation, and review. At the end of the session they have to present their answers (Dolan et al., 2013; Mitra, 2015). During the session, children are allowed to change groups, talk to their friends in other groups, and walk around the room for observing others’ work (Mitra, 2015). The SOLE toolkit suggests that SOLE can be adapted to fit in each school context, and teacher’s role is minimized to be an observer and let children do their works (Dolan et al., 2013; Mitra, 2015).

With the success of SOLEs with young learners, Mitra (2016) has created a project under the name ‘School in the Cloud’ as a platform of self-organized learning, and there are more than 16,000 SOLE sessions from partner learning labs worldwide including Pakistan, Colombia, and Greece. SOLE’s concept is ‘flexible, has the potential to offer a divergent, radical transformative pedagogy’ (Dolan et al., 2013, p.1) which attract not only teachers in primary schools but teachers from secondary schools, vocational colleges, universities, and informal education. Rix and McElwee (2016) conducted a collaborative action research to study whether SOLE can increase engagement and learning in secondary students in England. They found that students were engaged and enthusiastic since the first time they experienced the SOLE lesson. The students tended to access and process more information than they did in a traditional lesson (Rix and McElwee, 2016). Three vocational teachers in the U.K. and India adopted SOLEs for Vocational Education and Training (VET) courses with 150 students (Ellis, Dyer & Thompson., 2014). The findings showed that students

who were in SOLE lessons had good scores in their assessments and sometimes better than students who were not. In the U.K., SOLE session was used with 18 English language learners in International House, London. The study found that SOLEs helped learners be more confident and fluent (Stanfield, 2016). The SOLE concept of self-organized learning has been recognized since Sugata Mitra was awarded a prize from TED Talk in 2013, and it is famous among educational researchers around the world. In 2014, Newcastle University opened SOLE Central as a global hub for research on self-organized learning (Mitra, 2016).

2.6.3 Rhizomatic Learning Structure

Learning resources in PLEs can be represented as nodes of learning; all nodes are connected as a network. Each node is openly linked to others without hierarchical steps or fixed direction (Lian, 2014). PLE structures are similar to structure of nodes of a rhizome, an underground stem of a plant that produces roots and shoots from its nodes (Rhizome, 2016). The Rhizome is a philosophical concept posited by Gilles Deleuze and Félix Guattari in 'A Thousand Plateaus' to describe multiplicity (Deleuze and Guattari, 1987). They stated that 'in nature, roots are taproots with a more multiple, lateral, and circular system of ramification, rather than a dichotomous one' (Deleuze and Guattari, 1987, p.5) which is in congruent with the interrelation of learning nodes in PLEs. A Rhizomatic approach is a botanical metaphor (Cormier, 2008) to distinguish arborescent and rhizomatic thinking, and Ellis (2014) made a comparison of these two concepts in her blog (see Table 2.3).

Table 2.3 Comparison of Arborescent and Rhizomatic Thinking by Cath Ellis (Ellis, 2014)

Arborescent	Rhizomatic
Fixed order Plotted points	Connection Heterogeneity
Unity	Multiplicity
Beginnings, Middles and Ends	Multiple entryways and exits; inbetweenness, becomings
Reproducible Describing a de facto state	Open Connectable Susceptible to constant modification
Competence	Performance
Hierarchical	Acentred Non hierarchical
Filiation	Alliance
Starting and finishing	Coming and going

Deleuze and Guattari (1987) proposed six principles of rhizome:

- 1) and 2) **Principles of connection and heterogeneity:** any point of a rhizome can be connected to anything other, and must be. This is very different from the tree or root, which plots a point, fixes an order.
- 3) **Principle of multiplicity:** it is only when the multiple is effectively treated as a substantive, “multiplicity,” that it ceases to have any relation to the One as subject or object, natural or spiritual reality, image and world.
- 4) **Principle of asignifying rupture:** against the oversignifying breaks separating structures or cutting across a single structure. A rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines.
- 5) and 6) **Principle of cartography and decalomania:** a rhizome is not amenable to any structural or generative model. It is a stranger to any idea of genetic axis or deep structure.

A Rhizome is a poststructural concept which explicitly outlines the notion of PLEs that there is neither starting nor ending point; it is a boundless interconnecting space of nodes. Every single node can be traversed without fixed structure or rules, but each connection happens according to its potential. The Rhizome reflects the real sense of learning system in which its structure is self-organization. It seems disordered, but each connection of node helps learners to strengthen their structure of

knowledge. Rhizome can be represented as a map with multiple entryways. Deleuze and Guattari pointed out that a map represents reality, but a tracing is the logic of the reproducing principle. A tracing is the tree logic that has ‘organized, stabilized, neutralized the multiplicities according to the axes of significance and subjectification belonging to it’ (Deleuze and Guattari, 1987, p.13). This logic is dangerous because its restrictive procedure does not allow any visible connections, but tends to force the follower to do the same. Therefore, Deleuze and Guattari suggested making a map to represent a rhizome not a tracing as ‘The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group, or social formation’ (Deleuze and Guattari, 1987, p.12). The following section presents some studies that employed the rhizomatic concept to investigate personal learning environments in educational contexts.

2.6.4 Previous Studies Related to Rhizomatic Learning Structure

Many researchers have applied rhizomatic concept to study about personal learning environments in the academic field (Leander & Rowe, 2006; Dabbagh & Kitsantas, 2012; Graham & Selmer, 2010; Saadatmand & Kumpulainen, 2012; Guerin, 2013; Pineda, 2013; Cochrane & Antonczak, 2015; Bozkurt et. al., 2015). Personal learning environment is an invisible space in which each learner includes tools and resources for their own learning. Therefore, it is a compilation of many things that one thinks would be useful and can help developing understanding of that concept. It may seem disorderly, but it is constructed for each personal use put forth by as Lian (2004, p.5) that ‘a rhizomatic structure should not be thought of as chaotic but rather as a self-regulating structure responsive to the

learners' needs as determined by the mechanisms in place'. Some samples of personal learning environments which were investigated through rhizomatic approach are presented below.

Maria Pineda (2013) applied the rhizomatic approach to investigate on students' learning resources through many types of diagrams of her students' personal learning networks. All participants were fourth year students from De La Salle University (DLSU) in Philippines, and they were studying Information System. The implementation started with an orientation by showing two samples of personal learning networks and described them in rhizomatic concept. She represented all learning resources as a network of nodes with multiple stems and shoots. All stems and shoots demonstrated students' interests and connections which were labeled as tags. She collected 50 diagrams for the analysis which studied about shoots and stems in three perspectives: academic, social, and others. She found that the fourth year students at DLSU had 5 shoots and 18 stems on average in their personal learning networks as shown in a sample below.

มหาวิทยาลัยเทคโนโลยีสุรนารี

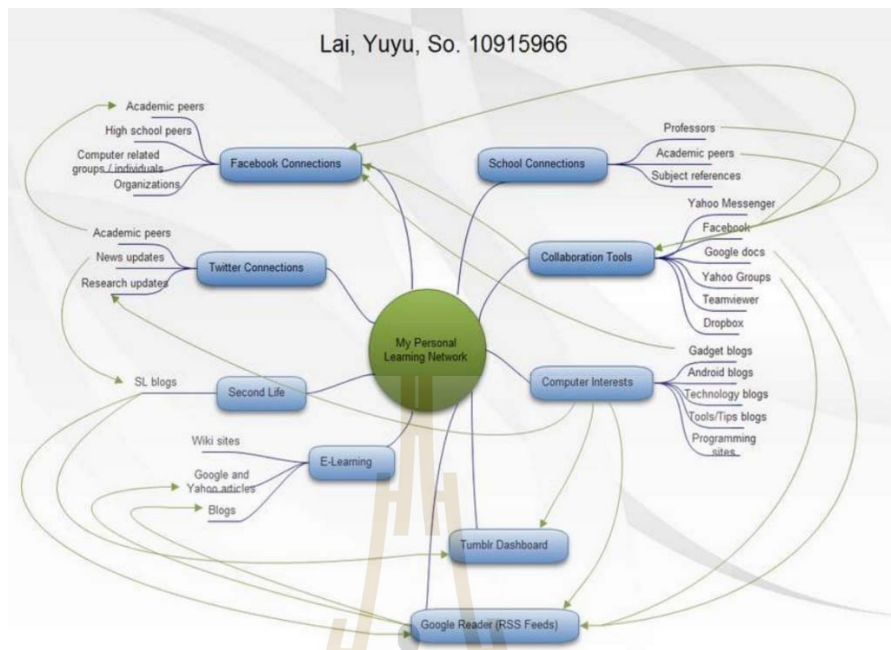


Figure 2.2 Sample of Personal Learning Network (Pineda, 2013)

Saadatmand and Kumpulainen (2012) applied rhizomatic concept to examine personal learning environment in two online courses from 2 institutions in Canada. One course was a massive open online course (MOOC) and another online course had the same structure as MOOC. The researchers defined the meaning of learning environment for this study with several terms such as ‘open and networked learning environments’, ‘open online learning environments’, ‘open learning environments’, and ‘open, digital and networked learning environments’. These terms refer to a course that applies online tools as learning mediums, and they could be used interchangeably. The main purpose of the study was about investigating learning experiences and online tools that were used by the participants during the course. They also focused on interactions among participants and their engagements in the social network while they were learning. There were four research instruments: online

survey, semi-structured interviews, researcher's field notes, and diaries. The data were collected as tools and processes from these participants while they were learning. A sample of Personal Learning Environment below shows that the participants integrate several online tools and applications for their own learning resources.



Figure 2.3 Tools and Process in PLE (Saadatmand and Kumpulainen, 2012)

2.6.5 Virtual Learning Environments (VLEs)

The technology of multimedia and the advent of networked computer made significant impacts and changes on learning styles. To be more specific, its effects on education are about digital and networked technologies that enable learners to be exposed to numerous learning resources which are available all the time (Jones and Sclater, 2010). Digital and networked technologies assist learners to overcome some difficulties in learning such as time, distance, insufficient budget, or physical obstacles. Additionally, some learning experiences are too dangerous, difficult, or costly to implement in the classroom. Hence, these technologies are more than just useful, but they need to be feasible in order to make some impossible learning experiences to be

possible. Jones and Dirkinck-Holmfeld (2009) analyzed the effects of technological devices and computer networks on learning environment as follows:

- **Time shifts** – Computer networks used in education affect the usual time patterns of education .Many courses delivered across networks are asynchronous.
- **Place** – The introduction of mobile and ubiquitous computing devices have begun to make the idea of education occurring at anytime, anyplace, and anywhere seem more feasible.
- **Digital preservation** – The outputs of synchronous and asynchronous activity are easily preserved in transcripts, logs and a variety of other forms including the archiving of web casts and audio interviews/podcasts.
- **Public/Private boundaries** – The preservation of what would otherwise be ephemeral materials alters the boundaries between what is public and what is private .Tutors can now view and preserve the details of student’s interactions during group activities, making these available as tools for assessment.
- **Forms of literacy** –The still largely text based world of networked learning has generated new forms of writing that are neither simple text replications of informal conversation nor are they formal written texts .The integration of images and audio into digital environments has suggested new forms of multimedia literacy.
- **Content** –The boundary between content and process is shifting .Blogs and wikis can provide elements of content and cut and paste re-use is common practice .The idea that there is a clear distinction between activity/process and artefact/content is becoming strained.

The early stage of using technology in education was designed with the centralized-control model for delivering information or content of academic courses online (Kluge and Riley, 2008). Its function serves the principle of administrative authority, not the principle of learning. The steps of learning in this principle are designed following the hierarchy model which was opposed to the nature of learning process of self-organization. Jonassen (2000) stated that this technological approach to teaching, using computers as a store of content, cannot make learners mindfully engage in making meaning. In the aspects of using technology for enhancing the capability of

humans, Jonassen (2000) introduced the concept of Mindtools - software applications as knowledge representation. He argued that computer should be used to 'support meaningful learning and knowledge construction in higher education as cognitive amplification tools for reflecting on what students have learned and what they know' (Jonassen, 2000, p.13) instead of using computer for content dissemination.

Mindtools are learners' intellectual partners (Herrington and Kervin, 2007) that are used critically by learners for meaning making about the content they are studying (e.g. thinking, analyzing, organizing, and interpreting). Mindtools are cognitive tools that are (un) intelligent as its intelligence is varied due to individual use of the tools; its intelligence is from the users not from the computer. Therefore, learners are the ones who take control of the processes of planning, decision-making, and self-responsibility. The computer is a learner assistant that is used for promoting reflection, discussion, and problem solving (Jonassen and Reeves, 1996). Mindtools can be classified as several types; Jonassen (2000) suggested there are five categories such as semantic organization tools, dynamic modeling tools, information interpretation tools, knowledge construction tools, and conversation and collaboration tools. The Mindtools concept serves the principle of knowledge construction in which learners are the controllers of the process themselves.

Virtual reality worlds, with technology of multimedia tools and digital forms of content, offer 'visual, aural, and tactile stimuli of a virtual world generated in real time' (Sánchez et al., 2001, p.2). At first, virtual reality technology is developed mainly for military training (e.g. flight and battle simulation and medic training) as virtual reality simulators because of cost effectiveness, and without personnel performing in high risk situations (Sánchez et al., 2001; Goldman Sachs, 2016). It is

increasingly pervasive in the 21st century, and the most remarkable advantage of virtual world is effective networked environment with multimedia tools and digital content that allows users to interact synchronously and asynchronously with objects and/or people (both for those who already know each other in real life and those do not) across the world. There are many virtual reality platforms that offer free online spaces for people around the world for socialization (i.e. Second Life, OpenSim, There). These 3D virtual world environments are sub-types of massively multiplayer online games (MMOG). They are multi-user virtual environments (MUVEs) that provide 3D visual (with and without sound), animations, role playing opportunities and social communities (Mennecke et al., 2008). Goldman Sachs (2016) reported that virtual reality technology is a potential market for computing platform in the next decade due to its technology advancement, price declining, and expanded market. Young people in this generation are accustomed to the use of virtual reality concept in their daily life as many leading companies develop their products follow this trend. The biggest market of virtual reality technology belongs to videogame business with more than 850 million hardcore gamers who play more than 15 hours per week (Goldman Sachs, 2016). Recently, Facebook has launched live streaming video function and 360-degree photos on its app. YouTube has announced 360° live-streaming with spatial audio, and Google has develop over 100 virtual field trips for students to explore the sites with Cardboard, a disposable head-mounted display (HDM).

Virtual world gives realistic sense to users as they cannot predict what will happen, and they get the feeling of first perspective from computer generated scenes as an immersive environment (Sánchez et al., 2001). These features attract many

researchers in the medical field to develop virtual reality innovations to solve medical problems, for example burn patients feel less pain when having wound treatment while engaging in virtual reality programs (Hoffman, 2004). Therapists can distract patients' feelings from their pain by controlling stimuli through these virtual reality programs. Hoffman (2004, p.2) identified that 'virtual reality is a uniquely effective new form of distraction; it makes an ideal candidate for pain control'. There are many virtual reality applications that are used as psychological therapy for changing unwanted behavior. Søraker (2011, p.62-63) pointed out that 'virtual reality first-person view can induce, and is often used to treat, phobias such as fear of heights or arachnophobia'. Neuroscience gives the best explanation about this matter by stating that human brain is plasticity; it is physically designed for modifying as its structures are constantly changeable (Hampton, 2015). The changing of neuron organization occurs in order to respond to the new stimuli or experiences (Cramer et al., 2011). Dr. Jamil El-Imad, Chief Scientist at NeuroPro AG, gave an explanation about neuroplasticity that it is 'the ability to rewire your brain. We are not hard-wired, and experiences can change this wiring' (El-Imad, 2015). It could be said that virtual world enables users to think and act through another life; the life that is free from limitation which is embedded with unsatisfied meanings. That corresponds to the statement of Alvin Toffler about 21st century learning skill is that learner should be able to 'learn, unlearn, and relearn' (Toffler, 1970). These three skills can be done through virtual worlds especially unlearn and relearn; learners can go back to the path that they have been through for reconstructing new meaning from new experience.

Girvan and Savage (2010, p.4) commented that 'However a substantial number of virtual world learning experiences reported in the literature continue to

replicate pre-existing, 'real-life' learning experiences, such as replicating lecture theatres for co-located or distance learners to attend lectures'. This statement reveals that there is a huge gap between the full capability of virtual reality concept and the actual use in education field. In fact, future education should base on 'integrative collaboration, flexibility, creativity, technological versatility, and a global and critical perspective' (Vásquez, 2008, p.2) in order to create a learning context that is favorable to unpredictable situations in the real world. Virtual Reality has the potential in giving 'the user a synthetic experience that intends to transfer physical and abstract concepts of a given environment' (Sánchez et al., 2001, p.2). In the education field, many studies integrate virtual reality in their courses such as the course of history of architecture in which students learn by interacting with objects in a 3D environment (Frontera, 2009). The most important feature of virtual reality is that users are able to manipulate things or objects suit their senses which cannot happen in the real life such as adjusting color, zoom in the image, rewinding the video, and playing back and forth the sound (Cheung et al., 2014). This exclusive feature enables users to obtain better understanding at the level of individual perception. Moreover, this feature offers an opportunity for relearning as learners can re-organize their understanding according to the new meaning.

The above reviews show the significant benefits of virtual worlds in the learning process that will be adopted by the present study. These benefits are as follows:

- 1) Virtual worlds are open environments that are an advantage to learning as learners have freedom to control their own learning journey. Learners can manipulate things or 3D objects according to their sensory systems. Even though, learners are

given freedom to sequence their own learning process, teachers can guide the process by putting in stimuli as catalyst for raising awareness of learning needs.

2) Virtual worlds with their strengths of network connection, multimedia technology, and a substantial amount of digital content form a large network of learning resources for free; can offer not only free learning resources; but freedom of time, distance, and external authority. This is essential for fostering learner autonomy. In addition, the sense of real presence in an immersive environment helps learners to overcome some difficulties that used to be obstacles for learning.

3) Virtual environments give learners the feeling of first-perspective which is important for knowledge construction in which learners are able to exercise their meaning-making mechanism of the 3Cs: confront, contrast, and contest (Lian, 2001) with their prior knowledge.

2.6.6 Virtual Learning Environments (VLEs) and Language Learning

Virtual reality concept is congruent with language learning in which learners are given the best opportunity of target language exposure that corresponds to their multi-sensory system. Learners are able to use their own knowledge to make meaning directly with authentic language resources that are actually used in their context. Learners autonomously select their own resources and interpret them on the basis of their own prior knowledge instead of waiting to be fulfilled by others with synthetic content. In other words, learners can choose their own content as resources for studying because of network technology that supports learners to make a link of potential information, tools, and people as a hub or node which they can use as personal consultant for constructing their own knowledge. Therefore, learning environments of each individual is varied depending on personal condition. In

conclusion, learning is an organic process (Robinson, 2010) that needs richness of authentic resources (as nutrients) in supportive context (as nurturing environment).

Learning a language in virtual worlds is definitely different from learning in a traditional language class. The traditional classroom has a fixed sequential learning step due to a teaching paradigm that the teacher must instruct his/her students with an amount of content that is selected by the teacher. Traditional classrooms rely heavily on teacher and content rather than focusing on the nature of learning process. Learning a language in virtual learning environment is the paradigm shift from teaching to learning. Barr and Tagg (1995) mentioned that it is necessary for an educational institution to produce learning instead of providing instruction. Consequently, learning environments need to be changed in order to get along with the nature of learning process in which teachers do not set up the rules, tell information to students, govern students' behavior, or manage class in order discipline. As Alan Guskin (cited in Barr and Tagg, 1995, p.13) stated that 'the primary learning environment for undergraduate students, the fairly passive lecture-discussion format where faculty talk and most students listen, is contrary to almost every principle of an optimal student learning setting'.

Virtual worlds can be classified into three types, as Sykes et al. (2008) divided virtual environments on the basis of their designing purposes: open social virtualities, massively multiplayer online games (MMOGs), and synthetic immersive environments (SIEs). Here are some examples of virtual environments of these three categories: open social virtualities are Second Life, Open Simulator, Active Worlds, Lively, and There (Thorne et al., 2009; Lin and Lan, 2015). MMOGs are Ragnarok, Everquest, Eve Online, and the most famous one is World of Warcraft (Sykes et al.,

2008). SIEs are Quest Atlantis, Croquelandia, and Zon (Thorne et al., 2009). There are various types of communication tool that are introduced for using in these virtual worlds, and they are beneficial for language learning as well. For instance Second Life provides several modes for interacting between avatars; local chat for public communication, instant messaging for private communication, gestures can be used for non-verbal communication which is useful for cultural studying, and voice chat for practicing speaking and listening comprehension (Kaplan-Rakowski, 2011). There are many language courses that are implemented online through these virtual spaces. Here are some examples of virtual learning environments that are used for language learning.

2.6.6.1 Second Life by Linden Lab

Second Life is a virtual world developed by Linden Lab in 2003 (Linden Lab, 2016). It is an online 3D environment which is built collaboratively by people around the world. Second Life members are called Residents who interact with each other through avatars. Second Life is the most utilized as a language learning platform (Lin and Lan, 2015) by various English teachers in formal education from many countries such as Australia (Henderson, Huang, Grant, & Henderson, 2009), Japan (Peterson, 2010), Turkey (Hismanoglu, 2012), Hong Kong (Khutzen and Kennedy, 2012), New Zealand (Gaukrodger and Atkins, 2013). However, Second Life is also attractive to English teachers from other types of education for example informal language learning class (Stevens, 2008), distance learning program (2010), adult language learning (Chen, 2014) and for other languages such as German (Carter and Elseth, 2009), Russian (Blasing, 2010), Spanish (Collentine, 2011), and Chinese (Tseng et al., 2013).



Figure 2.4 A scene from Second Life Virtual World

Second Life is the most famous virtual world (McIntosh, 2008) as Ebbe Altberg, CEO of Linden Lab, claimed that there are about 900,000 active online users (cited in Charara, 2016). It seems that this is the reason why Second Life is chosen for language learning area because of its largest online community. Second Life residents can do many activities for free such as exploring 3D virtual sites (replica of actual famous landmarks or imaginative locations which are constructed by its residents), socializing with any interested communities or groups of people, participating in synchronized events with people around the world, and creating and trading virtual items and/or services (Griol et al., 2014). Although Second Life has a lot of features that are potential for language learning, there are some disadvantages as Mark (2012) describes below.

Table 2.4 Disadvantages of Using Second Life in Education Provided by Christine L. Mark (Mark, 2012)

Issues	Details
1) Technical problem	Second Life is a 3D virtual world that must be operated on a good processor computer with high speed internet for the most effective display .In order to get full feature of virtual world technology those computers need to have multimedia visual and audio facilities which are good graphics card and speaker and microphone system .Users need to install Second Life software in the computer to be accessible to the virtual world which may not be possible for public computers in libraries or computer labs.
2) First-time users require time for practicing	First-time users have to learn how to use tools for navigation and communication in Second Life.
3) Inappropriate content	Some content in Second Life is inappropriate for young users so teachers need to be aware of this matter.
4) Open space for everyone	Second Life is an open space for everyone so users should be taught how to protect their identity in order to avoid cyber harassment.
5) Need preparation time for learning activities	Teacher needs time and knowledge for preparing learning activities in a Second Life .

Second Life offers land for avatars to create their own regions and provides tools for creation of virtual objects which attract lots of people for doing business by using these features. For owning a region, an avatar has to buy a piece of land with Linden dollar, and it can store 3D objects, audio files providing background noise for the space, and scripts for other avatar can have interactivity with those created items (McDonough and Olendorf, 2011). Second Life's feature of user-created content is the most famous, and it gains a lot of attention from government agencies (e.g. embassies of Maldives, Sweden, and Estonia), major institutions (e.g. universities of Harvard, Princeton, and Stanford), and leading companies (e.g. IBM, Microsoft, SUN, Toyota, and Honda) in making an investment to build virtual sites for marketing their organizations (Messinger et al., 2009). This user-created content feature is really

interesting, and it could be very much useful for language learning in terms of creating learning resources. However, users need to have the knowledge of using Second Life Build tools and how to manipulate prims. Primitives or prims are the basic formation of 3D objects which are modifiable to make everything as imagination in this virtual world. It can be considered as difficult for new users, and they need time to practice. Its technical problems as summarized by Mark in Table 2.4, Second Life is not appropriate for this study as it requires high speed of internet connection. This may cause problems due to bandwidth lag when all participants login at the same time. Next, another virtual site that is chosen for this study is reviewed.

2.6.6.2 IMVU by IMVU Inc.

IMVU (Instant Messaging Virtual Universe) is a virtual platform for communication and socialization which was founded in 2004 by IMVU Inc. Its members are young adults age 18-24. It has more than 50 million registered members with 3 million monthly active users (IMVU, 2016). The main purpose of IMVU is a virtual platform for meeting and socializing, and each avatar owns a chat room that allows 10 visitors at a time. IMVU members can have conversation with each other through their own customized avatars in their own rooms or by visiting others. An avatar can participate in more than one room by typing in keywords in the searching box. IMVU members need to sign up for an account and download an application for access to this 3D virtual world. IMVU offers free credits for users who participate in its activities like playing games, completing a survey, or watching videos. Members can use those credits for buying 3D items such as furniture, accessories, pets, clothes, and other types of room (e.g. pub, restaurant, pizza shop, or coffee shop). These 3D virtual items are created by its own members which are available for purchasing in the world's largest virtual

goods catalog as IMVU claims that there are more than 6 million items with 7,000 new items added daily (IMVU, 2016). Members can create these virtual items for their own use and put it on IMVU catalog for sale. There are lots of tutorial video clips in making virtual items available on YouTube both in Thai and English for new users.



Figure 2.5 Sample of a Chat Room in IMVU

IMVU provides communication tools similar to Second Life except voice chat. IMVU used to have this tool which members had to pay for, but there were a few members who used it so it was removed (Martindale, 2015). To have a conversation with other avatars, members can do so easily by going to a chat room that they like, typing in chat box at the bottom of the screen, click enter and then the text will appear in a bubble above the head of their avatars. The conversation flows naturally according to the speed of internet connection, and also the speed of each avatar responses in the chat room. IMVU is a text chat based virtual worlds or it can be called computer-mediated communication (CMC). According to hyperpersonal communication model by Walther (1996) who suggested that this type of communication yields the same results as face to face interaction because they are for

developing social relationships (Freeman et al., 2016). Moreover, Walther (1996) specified that communicating through text allows more time for users to think or revise before typing and sending out the text. CMC tends to produce positive feedback loop on communication in the sense that communicators try to be selective present information to their online friends (Caplan and High, 2011; Van Der Heide et al., 2012, Schumacher, 2013). However, the impact of communication through instant messaging is also interesting in terms of its effect on the use of language Marshall McLuhan stated that ‘The medium is the message’ which emphasizes on the impact of media on behavioral change of humans (McLuhan, 1964, p.1). In other words, instant messaging is not only the communication tool for disseminating information but it makes a huge impact on language use as pointed out by McLuhan that ‘This is merely to say that the personal and social consequences of any medium - that is, of any extension of ourselves - result from the new scale that is introduced into our affairs by each extension of ourselves, or by any new technology’ (McLuhan, 1964, p.1). Chatting by texting is absolutely different from talking; to comprehend the chat text requires reading not listening skill. Therefore, the style of using these linguistic elements such as vocabulary, emoticons, abbreviation, word shortening, and grammar rules may be changed because of the effect of the medium use in communication.

2.6.7 Previous Studies Related to Language Learning Through Virtual Learning Environments

Virtual reality is a new trend of interactive environment, and it has been integrated into language learning for many years. Sykes (2010) summarized some characteristics of multi-user virtual environments (MUVEs) that are supportive to language learning. These characteristics are categorized from various studies related to

CALL: second language acquisition, instructional technology, anthropology, and education as follows (Sykes, 2010).

1. Varied task type and occurrence of negotiation of meaning/action
2. Effective, multilevel, environmental feedback
3. Opportunities to focus on different/multiple aspects of the language, including discourse functions and syntactic complexity
4. Different and varied participant roles; the possibility of creating multiple selves
5. Co-construction of the interaction, environment, and social networks to fit individual needs
6. Individualized, adaptable experience
7. Engaging, meaningful participation
8. Collaborative and social
9. Archiving of interaction for future analysis, feedback, and assessment

With these interesting effects on language development, there are many scholars who study about applying virtual reality in enhancing language learning. Some related studies in this concept are presented below.

Collentine (2011) conducted a research to investigate the effects of reading tasks in a virtual world on 58 Spanish learners at university level. The study also investigated the relationship between learners' autonomy and their language production in terms of complexity and accuracy. The implementation consisted of two tasks for two class periods of one hour and a half. These two tasks were designed by the researcher which required all participants to solve problems in two crime scenes. The first situation was about a missing person, and the second task was about a murder case. The participants had to read information written in Spanish and they needed to look

around the scene for some clues within 10 minutes. After that they worked in pairs to use Spanish to interview other people in the scene to gain more information. Then, they had to give their answers by typing in iChat program. For the first task, they had to give a reason why the person had disappeared. For the second task, they had to explain what happened in the murder. The study results indicated that the intervention affected their learning autonomy which helped develop complexity and accuracy in their Spanish skill.

In 2012, two Japanese researchers, Hiroki Ishizuka and Kiyoshi Akama, studied about English learning among 10 university students in Second Life platform (Ishizuka and Akama, 2012). They applied robotic agents which were called an automatized interactive task space (AITS) to communicate with the participants in a virtual world. They used task-based approach which was defined by Skehan to design their learning lessons. Their implication was integrated with Interaction Hypothesis (IH) which is a theory of second language acquisition in order to promote face-to-face interaction and communication. The implementation had three parts: initiation component, task component, and evaluation component. A shopping task was described as a sample. Participants were directed where to go shopping, what to buy, and how much they could spend. Then, they performed the task and gave an evaluation by summarizing what they had done. There were only six participants who accomplished the task and used only 12 minutes in average. Four participants could not fulfill the tasks. Their qualitative analysis showed that only four participants used negotiation of meaning strategies to help them complete the tasks, and the other two did not use this. Three participants left the program before completing the tasks without any evidence of using negotiation of meaning strategy. One participant

attempted to use the strategy but failed because of misspelling the word 'perdon' instead of 'pardon'. The study revealed that participants tried to use many language strategies to negotiate their meanings in order to help them accomplish the task.

2.7 Conceptual Framework

Through this chapter's in-depth review of knowledge construction and learning process in postmodern paradigm, it is clear understanding that learning is a natural system that can be developed through self-regulating process with its environment in order to respond to its needs. Learning resources and context are the two essential elements that support the learning process. This study attempts to promote the learning process by applying Macrosimulation activity in a virtual learning environment because of two reasons. First, learners can practice English through Macrosimulation according to their own ability because they don't have any script for memorization. Hence, learners need to rely on their own language knowledge to create the best interaction with each other. Second, the simulation is implemented for ten weeks, so learners are engaged in their selected roles longer than in traditional role play. Virtual learning environment is chosen for being a learning space in this study because studies show significant results about its advantages on language learning progress as reviewed in this chapter.

This research project is developed on the basis that language learning is an interaction of individual meaning-making mechanism with its environment to construct its own meaning from perceived experiences. According to the literature review, the notion of autonomy on the basis of autopoietic concept and neuroplasticity concludes that learning is an autonomously constant process of an organism;

neuroplasticity is the brain capacity to function corresponding to the frequency of neurons connection. Frequency and length of time of connection do matter for strengthening its structure. Therefore, learners in this study are able to manage their own time to make sense of their learning resources following their own sequence at the level of their own perception without interference by the teacher.

This study aims to explore the learning process of autonomous language learners, and how they construct their own language knowledge. Although knowledge construction is an intangible process, the learning process is visible through mapping. The concept of rhizome by Deleuze and Guattari (1987) is adopted for analyzing the process as it can reflect the essence of learning - that learning is a self-organizing process and responsive to context, its structures are linked as a network of nodes in a boundless space. The study focuses on learning process; therefore it is possible to observe various manners of learning steps because each learner will have a different interpretation based on individual perception.

2.8 Summary

This chapter outlines the conceptual framework of the study with a review of related literatures which examined postmodernism as principles of knowledge construction and learning process, the notion of language learning, learning theories and implication of constructivism in Thai education, autonomous language learners in this era, and learning environments in 21st century.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The study is underpinned by postmodernism and constructivism. The combination of these two notions provides insightful perspectives for designing this study. It aims to create an English learning environment that supports language learning process. This chapter discusses the method used and it is divided into seven sections. The first section is the introduction of the chapter. Then, the research design is presented. The third section discusses the research instruments including MacroSIM, pretest and posttest, learning autonomy questionnaire, evaluation questionnaire, Facebook group and recorded video clips, and student diary. The fourth section explains the validity of the instruments, and the fifth section describes data collection methods and which is divided into two parts: general and specific procedures. The sixth section discusses about data analysis where quantitative and qualitative data are analyzed and presented separately. Finally, a summary of this chapter is presented at the end.

3.2 Research Design

This research study employed a mixed-method approach which combined qualitative and quantitative perspectives. Dealing with the research questions, a qualitative approach was applied to describe what was happening in the process. The

qualitative approach was also used for exploring and interpreting the data in order to explain the relationship between variables of the study. On the other hand, the quantitative approach is applied for collecting, analyzing, comparing, and summarizing the quantitative data. According to the research questions of this study, the research design tends to be a qualitative inquiry. It does not mean that a quantitative approach was not appropriate but the major concern of this research was about the learning process as a human instrument. Lincoln and Guba (1985, p.199) elaborated that ‘the human-as-instrument is inclined toward methods that are extensions of normal human activities: looking, listening, speaking, reading, and the like’. Thus, qualitative methods are more suitable to the human source which requires interviewing, observation, and nonverbal language situations (Lincoln and Guba, 1985). The study aimed to understand the language learning process of autonomous learners which was reflected through personal learning environments following their learning experiences in a constructivist learning environment. The main focus was on studying the structure of the learning system of language learners who autonomously experienced learning English in a virtual world through MacroSIM.

The aim of this study is to improve the participants English language proficiency through MacroSIM in IMVU virtual world on the basis of constructivist learning concept. It was conducted in a quasi-experiment with two groups of participants: a control and an experimental group. The quasi-experiment is designed to investigate the causal impact of an intervention on the samples. Shadish et al. (2002, p.14) suggested that ‘In quasi-experiments, the cause is manipulable and occurs before the effect is measured’. The participants of this study were two groups of English major students from weekday and weekend classes. The experimental

group was implemented with weekday students while the control group was weekend students who enrolled in the same course. In order to understand the results of the treatment, the data were collected qualitatively and quantitatively. Quantitative data were collected from three research instruments: pretest and posttest, learning autonomy questionnaire, and evaluation questionnaire. Then, they were analyzed and tested statistically. On the other hand, qualitative analysis was integrated with the rhizomatic approach to examine the learners' progress of English. In addition, other information related to the program was investigated through recorded video clips and students' diaries to triangulate the results of quantitative data.

3.2.1 Participants

Two intact classes of Business English major students, both weekday and weekend students, were selected as convenience sampling to participate in this study. According to Teddlie and Yu (2007) convenience sampling is drawing samples that are both easily accessible and willing to participate in a study. All participants of the current research were students who enrolled in the course *English for Restaurant and Catering Services* in the second semester of academic year 2016 at Nakhon Ratchasima Rajabhat University (NRRU). Usually, this course is offered for 3rd year students as a compulsory course. The researcher was the teacher for the weekday class of 39 students, and it was assigned as the experimental group. Then, the control group was assigned to the weekend class; there were 23 students who studied this course with another teacher. These two groups of participants had passed two courses of English for Communication as general language course and eleven courses of English compulsory courses in the curriculum. Six of them were ESP courses: *English for Business Communication 1*, *English for Business Communication 2*, *English for*

Domestic Tourism, English for Hotel, Reading English for Business, and English for Secretarial Management.

3.2.2 Variables

From the literature review in Chapter 2, the notions of the knowledge construction and learning processes provided a clear understanding that interaction of learning autonomy and language resources in a constructivist learning environment can influence language proficiency. In accordance with the objectives and research questions of the current study, the independent variable was MacroSIM in IMVU virtual world. The dependent variables were learners' scores of English proficiency from the pretest and posttest, level of learning autonomy, and evaluative perceptions towards the MacroSIM program.

3.3 Research Instruments

There were six research instruments: MacroSIM, a pretest and a posttest, a learning autonomy questionnaire, an evaluation questionnaire, a Facebook group, recorded video clips, and students' diaries. All research instruments are described in detail below.

3.3.1 MacroSIM

MacroSIM was designed to support learning system on the basis of postmodern and constructivist concepts that knowledge is constructed by interaction of individuals with their environments. The more learners can connect to English, the more they can interpret meaning. The more meanings are interpreted, the more they can construct knowledge. The course *English for Restaurant and Catering Services* aims to prepare learners to be ready to communicate with customers in restaurant

services. It intends to help learners to practice vocabulary about Thai and international foods. Learners are trained by having conversations which are used in the food and beverage sector such as taking orders, introducing the menu, explaining about food ingredients, and describing basic cooking methods for the dishes (English Program, 2012). Normally, English teachers at NRRU prepare their teaching materials in advance by selecting commercial texts from several publishers. The course lasted for 16 weeks with three 50-minutes class period (150 minutes) per week.

MacroSIM was created as a language learning environment to foster the learning process according to the condition of human differences as described by Lian and Lian (1997).

‘Given the differences between people, teacher can never know what pieces of knowledge to give and when to provide them as it is not possible to know the nature of the “what” and the exact moment of the “when”. Only the learners is able to decide, and not always in a conscious manner, the required “what” and “when” as it can only be the learner who is ultimately in charge of relating to one another the various pieces of information available and thus to construct meanings’. (p. 2)

Therefore, it is impossible for a teacher to create a language lesson that suits all the students in a class. In light of the review of knowledge construction presented in Chapter 2, knowledge is constructed internally through meanings that one perceives from the interpretation of experience. The knowledge itself is intangible as it cannot be seen, heard, written, or spoken. Instead, knowledge can be observed when it is used to solve problems. Hence, a teacher cannot judge or choose any piece of information and present it to his/her students claiming that it is knowledge. With this reason, MacroSIM does not consist of any content or information; it has only four tasks to complete. The four tasks in MacroSIM required all participants to simulate

four roles in a restaurant; a customer, a waiter/waitress, a chef, and a manager. All participants were required to take part in each role for one hour. Richards and Rodgers (2014, p.175) explained that task work gives learners ‘a better context for the activation of learning processes than form-focused activities, and hence ultimately provides better opportunities for language learning to take place’. Task is considered as a language learning activity with non-instructional purposes (Singhasiri and Thepsiri, 2015). Then the role of the teacher for this study was to provide assistance and facilitate learners with learning resources.

MacroSIM also offered freedom of action and freedom of choice for learners; to let them be the controller of their own learning journey. MacroSIM did not have fixed-sequence learning steps; and learners could start their learning process at any point that they felt comfortable and had a willingness to do. In MacroSIM, all participants needed to perform assigned actions through four simulated positions as customer, waiter/waitress, chef, and manager of a restaurant. Each role required one hour of simulation and it was counted by the length of time from the recorded clips that each participant submitted. The participants did not necessarily have to simulate a role for one hour at a time; they can perform separately. The researcher checked and counted each participant’s simulation from recorded video clips which were stored in the university’s server. The table below presents the four tasks with assigned actions in MacroSIM.

Table 3.1 Roles and Assigned Actions in MacroSIM

Roles	Assigned Actions
Customer	<ul style="list-style-type: none"> • Simulate as a restaurant customer in any restaurant in IMVU for one hour. • Make comments about the food, service, and atmosphere of each restaurant you attended by posting on the Facebook Group.
Waiter/Waitress	<ul style="list-style-type: none"> • Apply for an available position as a waiter or waitress for five restaurants. • Simulate as a waiter or waitress for one hour.
Chef	<ul style="list-style-type: none"> • Apply for an available position as a chef for three restaurants. • Simulate as a chef for one hour.
Restaurant Manager	<ul style="list-style-type: none"> • Make announcement for a job vacancy for two positions; waiter/waitress and a chef for your own restaurant by posting on the Facebook Group. • Simulate as a restaurant manager for one hour to interview three job applicants for recruiting.

Each member in IMVU is provided with a free chat room that can have ten visitors at a time so that the participants can decorate their own places as restaurants. In addition, there are lots of chat rooms offered with various types of restaurants in IMVU. Participants could practice using English by participating in any restaurant they like or selecting from a suggested list which was prepared by the researcher. Some restaurants and coffee shops were available, and they were selected as simulation scenes for the experimental group. They all were built and decorated by other IMVU members, but those members stopped using IMVU for many months. Therefore, these places were perfect for being as simulation scenes for the program. The list was introduced to all participants at the onset of the course, and it was posted in the Facebook group. However, some participants preferred to look for other places by themselves and invited their friends to visit their restaurants for the simulation.

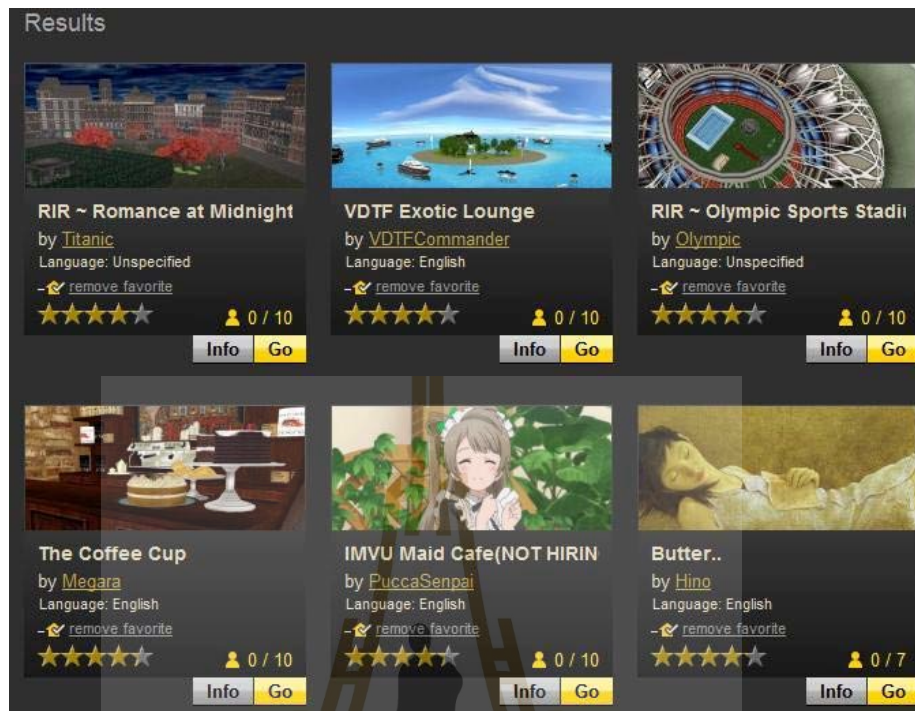


Figure 3.1 List of Available Restaurants in IMVU Virtual World

Learners participated in the IMVU virtual world and acted through the simulated characters of their own choice. MacroSIM provided freedom of learning path and enlarge a wide range of communicative activities with realistic situations. Therefore, learners were free to determine their own learning activities, activities that suit their own goals or fit their own needs. In other words, they were encouraged to use English for their own purposes. These four roles required learners' long-term engagement to interact with others for successfully achieving each task. The IMVU virtual world is a free online virtual space with many people around the world using it daily for social networking. It is not a closed system, so learners have lots of chance to meet foreigners who have a variety of target language abilities.

Consequently, learners needed to rely on their own language knowledge for solving problems or trying to make sense of new experiences. MacroSIM was not as

strict for classroom management as traditional classes; it emphasized on the learning process. Learners were free to talk with their peers, exchange ideas, observe their peers' works, walk around the room, and consult with others to find solution to their problems. The course had neither preset objectives nor expected any learning outcome. Its aim was to let learners make sense of the target language as much as possible. The teacher was their consultant or assistant who did not judge their performance for grades, but tried to guide them by supporting resources and helped them by giving feedback. The role of a teacher in a constructivist learning environment should be the one who facilitates learning resources in order to stimulate the learning process. In this sense the roles of a teacher for the MacroSIM program were to guide, support, and encourage learners to take their own learning journey. These roles were different from the teacher's roles in traditional teaching style which emphasized on giving instruction. Therefore, the main focus of the teaching approach is about content of that knowledge, but for the learning approach, it is about direct experience of using the knowledge.

Learning English in a virtual world was very new experience for all participants in the experimental group, and they were not familiar with the simulation approach. At the beginning of the course, the teacher helped by asking them to introduce themselves to three foreigners in IMVU. They needed to inform these online foreigners about the purpose of their use of this virtual world and invited them to visit their restaurants. This method stimulated all learners to practice using English directly with foreigners without teacher's instruction.

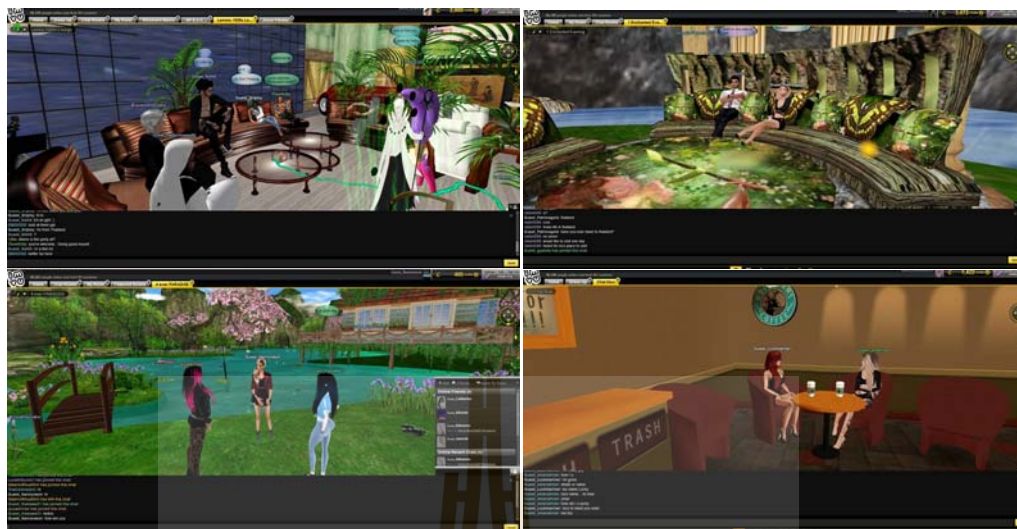


Figure 3.2 Participants Introduced Themselves to Foreigners in IMVU

MacroSIM was implemented as the research treatment for three months (ten weeks) of the second semester, and all learners were required to have a mutual agreement about the participation. First, they had to work collaboratively in communicating with each other in English and carried on the virtual world continually until the end of the course. Second, learners had the freedom to interact with others by using computers inside and outside the campus at any convenient time. They should keep in mind that their learning experience was the most important thing for this course, so they should try to participate in the IMVU by themselves and not let others pretend to be them. Third, all interactions in their virtual learning environments were recorded by display recorder software (e.g. Bandicam) by teachers and the learners themselves. At the end of each class learners were required to store their recorded clips in the university server.

3.3.2 Learning Time and Learning Resources

It could be said that the amount of time that each learner use when studying something can predict the learner's achievement. Time on task is crucial for the learning process but it is not the most important factor as Karweit (1984, p.33) stated that 'Time is necessary, but not sufficient, condition for learning. Learning takes time, but providing time does not in itself ensure that learning will take place'. She pointed out that policy makers, schools, or educators are concerned with the amount of time that students spend on a task in spite of the time needed (Karweit, 1984). The effectiveness of language learning process also depends on 'purposeful language activity in a culturally rich environment' (Lian, 1995, p.2). MacroSIM was constructed based on these two concepts: purposeful language activity and learning environment. MacroSIM was not restricted in time controlling. Learners could use their own time to prepare themselves and they could perform the role when they felt they were ready.

Moreover, the accessibility of learning resource is also vital for learning as learners can create understanding through the resource that they feel comfortable with. Technology provides ultimately learning resources which are authentic and Lian (1995, p.4) expressed that 'Experiencing these authentic, highly contextualized, language events will assist in the development of an in-depth understanding of what it means to be'. MacroSIM did not provide any content or example of conversation. The participants had to generate their own conversation based on their own English knowledge to correspond to the conditions in its context. Therefore, the participants had more chances to identify their own needs and tried to figure out the way to overcome those needs. That was the starting point of the process of learning.

3.3.3 Pretest and Posttest

The pretest and posttest of this study served as the language assessment for determining the language proficiency of each participant. The study employed the use of DCT (Discourse Completion Test) because it offered a wide range of possible responses that participants used to react towards various circumstances specifically in the restaurant context. This was the main reason why DCT was chosen as a research instrument for the study instead of using a standard test. The DCT was constructed with eight situations as a pretest and posttest. The situations are relevant to four roles: customer, waiter/waitress, chef, and manager.

Discourse Completion Test (DCT)

Situation 1:

You are a customer who is sitting in a pizza shop. After you finish having your meal, you want the waiter to bring you the bill.

You say:

Situation 2:

You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his suggestion.

You say:

Situation 3:

You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Waitress: Oh, I'm really sorry about that!

You say:

Situation 4:

You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

You say:

Situation 5:

You are a waiter/waitress in an expensive restaurant. A woman calls you and says:
 Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

You say:

Situation 6:

You are a chef at a restaurant. A customer compliments your cooking after dinner.
 Customer: Your food is so delicious. You're a fantastic chef!

You say:

Situation 7:

You are an owner of a café who is looking for a part-time waiter/waitress. A girl calls to apply for that position.

Girl: Hello! I'm interested to apply for the position of part-time waitress.

You say:

Situation 8:

You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

You say:

Participants of the control and experimental group were given the pretest before starting learning English from the course, and they were required to do the posttest at the end of the semester. The time allowed for giving responses to all eight situations was 30 minutes.

3.3.4 Evaluation Questionnaire

After discussing the notion of evaluation from related studies in Chapter 2, it can be concluded that evaluation should reflect the effects of the learning process as a whole and should not only reflect a set of standards that someone expects. For this study, the evaluation emphasized the usability and acceptability of MacroSIM.

MacroSIM tasks were language learning activities in the IMVU virtual world which had the significant feature of a network connecting people and objects as resources for language learning. The tasks were designed to foster participants' autonomy to operate their own learning system. Its operational system was controlled by the participants, so the details in the evaluation questionnaire were related to their perceptions of usability and acceptance of MacroSIM. Usability and acceptance were two main factors that Gil-Gómez et al. (2013) focused on assessing virtual rehabilitation systems as they created a virtual game for helping patients who have rebalancing problems. They constructed a Suitability Evaluation Questionnaire (SEQ) which covers 13 items with a 5-point Likert Scale and 1 last item is an open question. The SEQ is developed for assessing an Active Balance Rehabilitation system (ABAR system) that helps patients to recover static and dynamic balance. ABAR is a virtual game that the patients interact with by themselves for 3 – 5 sessions for 30 minutes each per week (Gil-Gómez et al., 2013).

This current study designed an evaluation questionnaire based on the SEQ. It had 14 questions, items 1 – 8 were about the advantages of the program with a 5-point Likert Scale ranging from 'Not at all' to 'Very much'. Items 9 – 11 were about the limitations of the program with a 5-point Likert Scale ranging from 'Not at all' to 'Very much'. Items 12 - 13 were graded from 'Very easy' to 'Very difficult' and the last item was open-ended question. According to the SEQ scheme, the first part of the questionnaire aimed to assess the feeling of the participants regarding the MacroSIM program. The second part was for measuring difficulty in learning English through MacroSIM in the IMVU virtual world. The last item was an open-ended question that

asked about participants' feelings about learning English through MacroSIM. It required students to provide a reason for their choices.

Table 3.2 Evaluation Questionnaire Adapted from Gil-Gómez et al. (2013)

Advantages	Response				
	Not at all				Very much
1. How much did you enjoy your experience with MacroSIM tasks?	1	2	3	4	5
2. How much are you exposed to English in the environment of MacroSIM tasks?	1	2	3	4	5
3. How successful were you in MacroSIM tasks?	1	2	3	4	5
4. To what extent were you able to control your learning process?	1	2	3	4	5
5. Did you experience freedom during your learning English with MacroSIM tasks?	1	2	3	4	5
6. How much has your English developed as a consequence of performing the MacroSIM tasks?	1	2	3	4	5
7. Do you prefer MacroSIM tasks to a traditional approach for English learning?	1	2	3	4	5
8. Do you think that MacroSIM will be helpful for your English learning?	1	2	3	4	5
Limitations	Not at all				Very much
9. Did you feel uncomfortable during your learning of English with MacroSIM tasks?	1	2	3	4	5
10. Did you feel confused during your learning English with MacroSIM tasks?	1	2	3	4	5
11. Did you feel uncomfortable with the facility of computer lab?	1	2	3	4	5
Difficulties	Very easy				Very difficult
12. Did you find the assigned roles difficult?	1	2	3	4	5
13. Did you find IMVU virtual world difficult to use?	1	2	3	4	5
14. Did you feel uncomfortable during your English learning experience with MacroSIM? Please indicate the reason.	Open response: Yes/No with reasons				

The questionnaire was given to all participants at the end of the course and it was translated into Thai to avoid misunderstanding. This evaluation questionnaire had

14 items which were not too much for the participants but sufficient enough for assessing usability and acceptability of the program. These questions were clear and direct to the point. Additionally, the participants could give the reason for their feelings about the tasks at the end of the questionnaire. Three experts who specialized in teaching English were invited to validate the questionnaire. The questionnaire was revised following their recommendations before being translated into Thai.

3.3.5 Learning Autonomy Questionnaire

The discussion of the learning process and autonomy in Chapter 2 provided a clear understanding that learning is natural process which humans use for their living. The learning process is an individual system that regulates itself with its environment, and it is a self-determined system. Therefore, autonomy is essential for the learning system as it is the main features that can help learners get through the process efficiently. In fact, it is the fundamental controller of human learning system. In this study, autonomy means being free physically and mentally for doing the things one wants to do. Participants had the right to make choices regarding their own learning issues without any regulation from the teacher. However, the researcher remained aware that learning autonomy needed time and process in order to reach proficiency. Thus the researcher gave advice to students when they needed it. In this study, learning autonomy was assessed through a list of the constitutive elements of learner control from the seven categories of learner autonomy by Lucy Cooker (2012). Cooker developed a model of learner autonomy using the Q methodology which is ‘a research method used in psychology and in social sciences to study people’s subjectivity’ (Q methodology, 2016). She suggested a set of seven categories as a full model of learner autonomy with 33 elements in the context of language learning at

tertiary level. Those seven categories are Learner control, Critical reflection, Motivation, Information literacy, Metacognitive awareness, Learning range, and Confidence. The model was validated by binomial testing which showed statistical significance at 0.5, $p < .000$) (Cooker, 2012). Below is a twelve-item autonomy questionnaire which is adapted from the constitutive elements of learner control from Cooker's full model of learner autonomy.

Table 3.3 Twelve Elements of Learning Autonomy Questionnaire Adapted from Constitutive Elements of Learner Autonomy by Lucy Cooker (Cooke, 2012)

Question	Response				
	Not at all				Very much
1. You can analyze/define your own learning needs.	1	2	3	4	5
2. You can set achievable learning objectives.	1	2	3	4	5
3. You can manage your time for your own learning process.	1	2	3	4	5
4. You can choose your own learning materials.	1	2	3	4	5
5. You can negotiate your own learning process.	1	2	3	4	5
6. You can select your own partners for pair/group work.	1	2	3	4	5
7. You can work on your own.	1	2	3	4	5
8. You can make choices about how work will be assessed.	1	2	3	4	5
9. You can assess discrete aspects of your own work.	1	2	3	4	5
10. You can assess the work of peers.	1	2	3	4	5
11. You can take responsibility for your own learning outside the classroom.	1	2	3	4	5
12. You can monitor your own learning progress over time.	1	2	3	4	5

Twelve constitutive elements were adapted for this study as the learning autonomy questionnaire. It was translated into Thai, and it was administered to the participants of the experimental group before starting the intervention and at the end of the course. These twelve statements focused on the ability of the participants to control their own learning process through MacroSIM in the IMVU virtual world. They were twelve items with a 5-point Likert Scale ranging from 'Not at all' to 'Very much'.

3.3.6 A Facebook Group and Recorded Video Clips

A Facebook Group was used mainly as an information center for communicating between the researcher and the participants. It was also used as an announcement board for information related to the restaurant business in the virtual world such as job vacancies, food promotion, or restaurant events. The Facebook group was a combination of language resources which was created by both the participants and the researcher specifically for this course. Participants could contact their teacher and peers via the Facebook group for any inquiries. They were allowed to post any learning resources that they found to be useful. For private inquiries participants were able to contact the teacher through inbox messages.

All the recorded clips were used for analyzing the progress of language proficiency of the participants when they performed simulated roles. Besides, there were lots of data in the clips that could be used for revealing language resources that participant applied. For example, while they were having conversations with other members in the IMVU virtual world, they might consult with their peers, teacher, websites, or programs if they had inquiries. Participants intended to use these tools for enhancing their language ability for solving problems. All these interactions were

integrated with the language used of each participant for qualitative analysis under the rhizomatic approach to see its connections as a network of personal learning environments.

3.3.7 Language Use in the IMVU Virtual World

The language proficiency of the participants was the variable of this study. From a postmodern viewpoint, language development could be seen through many perspectives. In this study, having direct experience in using the language was more important than memorizing a pre-scripted dialogue. Therefore, errors were often found through the use of English by the participants. However, this method stimulated the learners to be more aware of their own performance and also the use of the language from their interlocutors as well. When participants were not confident about the correctness of their English sentences, they could ask their friends, consult with the teacher, or use online translation program. The teacher always walked around the room to observe participants' performance to make sure that they tried to communicate by themselves. It was acceptable to recite some sentences, but they were not allowed to copy from a pre-scripted text directly. Moreover, it was easier to monitor participants' performance by using computer to trace their conversation. This was very convenient and helpful to the observation process because the researcher could follow many participants at once.

The quantitative progress of the target language is shown by the scores in the pretest and posttest. However, language use of the participants while they were simulating the roles could be a source of evidence for qualitative analysis. The participants' language proficiency was analyzed based on their individual progress. One of the main features of the IMVU virtual world was that it is an open social

network for people around the world, so we cannot tell who is actually producing the target language of each avatar. Then the source of language data was taken from participants' interactions when they were in class only. The reason was to avoid deceptive participants. The data were collected from recorded clips that all participants had stored in the university server at the end of each class. These clips were recorded by using display recorder software by the participants themselves. The conversations were analyzed thoroughly for any significant progress of language performance.

3.3.8 Feedback Protocol

Giving feedback for language learners is important for their development, and it could be used as the starting point of the learning process. It is a type of learning assessment which the teacher provides to students in order to promote the learning process. Feedback is the reflections of learners' performance and this knowledge can help learners identify their own learning needs. Feedback is also another way of raising awareness when learners fail to achieve their goals. Constructive feedbacks should be offered after they perform the target language in order to help them contrast their knowledge or as Lian described 'personal understandings, beliefs, and personal logic' (Lian, 2000, p.8) with the requirement of the tasks. Lian (2000, 2004) explained that learning needs emerge when learners use meaning-making mechanism (confront, contrast, and contest) with the tasks. This study applies three ways of providing feedback by Crooks (1988) as a feedback protocol as described below.

- 1) Feedbacks were given for stimulating and encouraging learning process. Those feedbacks made them feel confident to try again if they failed. Content of feedbacks focused on their performance rather than comparing with others.

- 2) Feedbacks were provided during and after the participants perform the tasks. When participants were in class, the researcher walked around the room to observe their use of the target language and pointed out if there were any grammatical mistakes. The researcher gave suggestions if they had any inquiries about the use of English.
- 3) Mistakes were considered as learning needs that participants had to make understand and find the way to their own solution. Mistakes could happen along the way of learning process so there was not any punishment for mistakes (e.g. blaming, reducing marks, or giving grades).

3.3.9 Student Diary

All participants were requested to write diaries about the learning process in this course as a record of their learning journey. For example what point of the target language did they want to know as their learning inquiries; what or who could help them about those inquiries; how could they get the solution or knew how to correct them. The diary was in a free format; the participants could record information by using diagrams or pictures that they felt would be essential and beneficial for their learning process. They were encouraged to note their feelings as they were useful for qualitative data analysis. The diary was kept in private to record their personal opinions which was used for this study only.

3.4 Validity of the Instruments

The two sets of questionnaires (learning autonomy and evaluation) were validated by three experts in the field. The questionnaires were administered to those experts both in Thai and English to avoid misunderstanding. These experts had checked for validity using a checklist via an item objective congruence (IOC) approach. Another group of three experts in language teaching were invited to validate the DCT assessment and MacroSIM tasks. The questionnaires, DCT

assessment, and MacroSIM tasks were revised and adjusted according to their suggestions.

3.5 Data Collection Procedures

The current study aims to collect quantitative and qualitative data from two intact classes of 3rd year Business English students who participated in the experiment. Quantitative data were collected from the pretest and posttest, learning autonomy questionnaire, and evaluation questionnaire. Qualitative data were obtained from the pretest and posttest, recorded video clips, and diaries. The table below presents the research instruments combined with research objectives to answer each research question.

Table 3.4 Research Question, Instruments, and Objectives

Research Questions	Research Instruments	Research Objectives
1) Research Question 1: Are there any significant differences in the language proficiency of each group of participants (experimental and control group)? If so, what are these differences?	<ul style="list-style-type: none"> • Pretest • Posttest 	To compare the English performance of each group of participants (experimental group and control group) before and after learning English through MacroSIM.
2) Research Question 2: What are the participants' perceptions of the learning process when learning English through MacroSIM?	<ul style="list-style-type: none"> • Program Evaluation Questionnaire • Diaries 	To investigate participants' perceptions of their learning process after learning English through MacroSIM.
3) Research Question 3: How do these participants perceive the value of learning autonomy?	<ul style="list-style-type: none"> • Learning Autonomy Questionnaire • Diaries 	To investigate participants' perceptions of their learning process after learning English through MacroSIM.
4) Research Question 4: What are characteristics of the virtual learning environments created by these autonomous language learners?	<ul style="list-style-type: none"> • Diaries • Recorded video clips 	To explore a sample of personal learning environment of autonomous language learners who participated in MacroSIM.

The procedure of data collection consists of two sections: general and specific procedures as described below.

3.5.1 General Procedures

The study was conducted in Nakhon Ratchasima Rajabhat University with two intact classes of 3rd year Business English students who enrolled in the course *English for Restaurant and Catering Services* in the second semester of academic year 2016. The procedure of data collection was three months (ten weeks) period of regular class time. The study aimed to investigate the personal learning environments of these participants who had learned English by attending in MacroSIM in a virtual world. The study was a quasi-experiment with two groups of participants: control group and experimental group that were implemented in regular class time from February – April 2017.

3.5.2 Specific Procedures

The procedure for data collection of this study started with having participants answering to the learning autonomy questionnaire. Then the DCT pretest was administered to test their English proficiency. The test had 8 situations related to a restaurant context, and participants were allowed complete it within 30 minutes. Each participant received a student diary for noting anything related to their learning process in this course. Then, MacroSIM was introduced to all participants with explanations about the four tasks that they had to complete within three months. After that, the IMVU virtual world was introduced, and the participants were allowed to design their own avatars and decorate their own chat rooms. They could start simulating their selected roles in the IMVU virtual world at anytime when they were ready. While they were in class, they had to make a screen recording and submit the

recorded video clips into the university server. The experiment lasted for three months, and at the end of the semester all participants were required to do the DCT posttest. Then, the program evaluation and learning autonomy questionnaires were administered with the experimental group. All participants of the experimental group returned the diaries on the last week of the semester for data analysis.

3.6 Data Analysis

This current study collected both quantitative and qualitative data from 39 participants who had learned English from MacroSIM, and 23 participants who had learned English under the traditional teaching approach. Quantitative data were from the DCT pretest and posttest, learning autonomy questionnaire, and evaluation questionnaire. Qualitative data were from the DCT pretest and posttest, recorded clips, and students' diaries.

3.6.1 Quantitative Data Analysis

Data collected through quantitative methods were analyzed for inferential and descriptive statistics. In order to compare the English proficiency between participants' scores of pretest and posttest, the Wilcoxon signed-rank test was utilized as the statistical technique for comparing median scores to gauge the progress of English proficiency of each participant. Then, the Wilcoxon rank-sum test of non-parametric statistics which was used for comparing two set of median scores. After that, the scores of the learning autonomy questionnaire were analyzed to determine whether or not MacroSIM fosters learning autonomy in these participants. Quantitative data that were collected from evaluation questionnaires was analyzed with descriptive statistics to summarize all participants' opinions toward the course.

3.6.2 Qualitative Data Analysis

Data collected through the recorded video clips and participants' diaries were analyzed qualitatively. The main purpose of this study was to investigate the personal learning environments of participants who had learned English through MacroSIM. A rhizomatic analytical approach was used to sort out any connections or information that was relevant for their knowledge construction process. Qualitative data analysis was used for interpreting participants' language learning progress individually based on the principle of knowledge construction as an individual process.

3.7 Summary

This chapter described the research design and methods used in the study. The participants, the variables, the research instruments, and the pedagogic procedures were presented. In addition, methods used for data collection and analysis were also explained in details.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

In order to respond to the four research questions as formulated in Chapter 1, this chapter is organized into six sections according to four research questions and a summary. Each part presents quantitative findings first and is supported by qualitative results. The quantitative data was from the scores of the pretest and posttest; they were analyzed by applying descriptive statistic. The comparison of language differences between these two groups were also found in their sentence length and language criteria which effected participants' score achievements. In addition, significant language difference was tested by a series of Wilcoxon signed-rank tests and Wilcoxon rank sum tests to examine the differences of English proficiency before and after the implementation. Moreover, there were two sets of questionnaire: Program Evaluation and Learning Autonomy Questionnaires. The Program Evaluation questionnaire was used to assess participants' satisfaction towards MacroSIM. Then, the Learning Autonomy Questionnaire was applied to assess their self-perception of learning autonomy. Qualitative findings were collected through pretests and posttests, recorded video clips, and diaries. Then, they

were analyzed by the rhizomatic approach to examine the effectiveness of the experiment and explore learning environments of these autonomous English learners in the virtual world. The four research questions are presented below.

- 1) What are the effects of MacroSIM on EFL learners' English proficiency?
- 2) What are the learners' perceptions of the learning process under MacroSIM?
- 3) How do the learners perceive the value of learning autonomy?
- 4) What are some of the characteristics of individual virtual learning environments as perceived by the learners?

4.2 Quantitative Results of English Differences

As the first research question asks 'What are the effects of MacroSIM on EFL learners' English proficiency?'. In order to answer this research question, English language proficiency of each participant in the restaurant context was assessed by the DCT pretest and posttest.

4.2.1 Overall Differences of English Proficiency of all Participants

All participants were required to give responses on eight situations using the DCT (Discourse Completion Test). Eight questions were designed on various situations of these four roles: customer, waiter/waitress, chef, and manager. The English proficiency evaluation was done by three raters experienced in teaching English as a foreign language from three different universities. The three raters rated the tests using a 6-point Likert scale rubric. Then these three groups of scores were

calculated as median scores of pretest and posttest for further analysis. The score for each situation was 20 points and there were altogether 8 items. Therefore, the total score was 160 points. Table 4.1 presents the results of pretests and posttests of the experimental and control groups in descriptive statistic.

Table 4.1 Pretest and Posttest Scores of the Experimental and Control Groups

Language Assessment		Experimental Group (n = 39)	Control Group (n = 23)
Pretest	Median	119.33	107.33
	Highest	151.67	135.33
	Range of Median	(102.00 – 130.00)	(103.33–115.33)
	Lowest	76.00	96.00
Posttest	Median	122.33	108.00
	Range of Median	(114.33 – 130.33)	(105.33 – 119.33)
	Highest	152.67	129.33
	Lowest	91.67	98.00

The findings reveal that after learning English through MacroSIM for ten weeks the participants of the experimental group tended to perform the posttest (122.33) better than the pretest (119.33). The median difference between pretest and posttest of the experimental group was 3. However, the results of the control group also reveal that their English performance was slightly better as the median of posttest score (108.00) was higher than the pretest (107.33). It could be observed that language performance of the control group was a bit higher as the median difference was 0.67.

4.2.2 Differences of Sentence Length of the Experimental Group

Table 4.2 presents the average of sentence length for 8 responses from all 39 participants of the experimental group. It reveals that the participants tended to write longer sentences to reply on every situation in the posttest which demonstrated their capability of using the language overall. Each reply of each participant was counted and calculated as average sentence length for pretests and posttests and they were compared for differences, as presented in the table below.

Table 4.2 Comparison of Sentence Length of the Experimental Group

Item	Pretest			Posttest			Mean Difference
	Total	Mean	SD	Total	Mean	SD	
1	149	3.82	1.92	163	4.18	2.05	0.36
2	317	8.13	3.50	350	8.97	3.51	0.84
3	240	6.15	3.95	320	8.21	4.97	2.06
4	410	10.51	3.41	438	11.23	3.54	0.72
5	448	11.49	5.04	534	13.69	6.97	2.20
6	324	8.31	4.31	385	9.87	5.67	1.56
7	395	10.13	4.38	431	11.05	4.85	0.92
8	463	11.87	6.32	566	14.51	6.34	2.64
Total	2,746	70.41	21.33	3,187	81.72	27.37	11.31

The results show that the numbers of word use by the participants in the posttest assessment was longer for all items. The average word use in the pretest was 70.41 words and in the posttest was 81.72 words. The mean difference of sentence length was 11.31. The longest response in the posttest results was item 8 which

asked the participants to perform the language in a role of a waiter/waitress who had to inform a customer about the non-smoking area. The average number of word use of item 8 indicated that participants had the most different language use in terms of sentence length in this item. In the pretest there were 11.87 words; and in the posttest there were 14.51 words with a mean difference of 2.64. The shortest sentence replied in the posttest assessment was item 1 which was about a customer asking for their bill. The average number of words used in the pretest was 3.82 and in the posttest it was 4.18 with mean difference of 0.36. The differences of sentence length rank in order are items 8, 5, 3, 6, 7, 2, 4, and 1 respectively. Table 4.3 shows all participants in three groups according to the differences of the sentence length that they replied to in both assessments. These three groups were either longer, shorter, or had no difference; they are all presented with an average word use and a score achievement.

Table 4.3 Differences of Sentence Length and Score Achievement of the Experimental Group

Sentence Length	Average Score	Number of Participants	Percent
1) Longer sentences (average difference 19.14 words)		28 participants	71.79%
• Score higher	15.58	15 participants	38.46%
• Score lower	-6.41	13 participants	33.33%
2) Shorter sentences (average difference -10.56 words)		9 participants	23.08%
• Score higher	10.11	6 participants	15.38%
• Score lower	-24.11	3 participants	7.69%
3) No difference		2 participants	5.13%
• Score higher	17.00	2 participants	5.13%
• Score lower	-	-	-
	Total	39 participants	100%

The majority group of 28 participants (71.79%) responded in the posttest assessment longer with an average difference of 19.14 words. While the minority group of 9 participants (23.08%) responded shorter with an average of -10.56 words. There were 2 participants (5.13%) who had no difference of sentence length in their responses. In addition, each group of the participants can be subdivided according to the score achievement as lower and higher scores. There were 15 participants who gave longer responses in the posttest and received a higher score of 15.58 in average and 13 participants who responded shorter had an average lower score of -6.41. Similarly, 6 participants in the group of shorter responses received a higher score of 10.11 on average while there were 3 participants who had lower than average scores of -24.11. For those who wrote their responses the same length received higher scores at an average of 17.00. Next, the difference of sentence length of the participants in the control group is presented.

4.2.3 Differences of Sentence Length of the Control Group

Table 4.4 presents an average of sentence length of 8 responses in the DCT pretest and posttest from all 23 participants of the control group. It reveals that some responses in the posttest were shorter than in the pretest which is contrary to the results of the experimental group.

Table 4.4 Comparison of Sentence Length of the Control Group

Item	Pretest			Posttest			Mean Difference
	Total	Mean	SD	Total	Mean	SD	
1	74	3.22	1.68	94	4.09	2.40	0.87
2	162	7.04	2.64	147	6.39	2.66	-0.65
3	110	4.78	4.78	103	4.48	3.03	-0.30
4	180	7.83	7.83	185	8.04	2.45	0.21
5	160	6.96	6.96	198	8.61	5.16	1.65
6	130	5.65	5.65	117	5.09	2.48	-0.56
7	181	7.87	7.87	148	6.43	3.01	-1.44
8	197	8.57	8.57	192	8.35	3.91	-0.22
Total	1,194	51.91	18.46	1,184	51.48	13.32	-0.43

The findings indicate that participants in the control group tended to give answers in the posttest that were shorter than in the pretest which is different from the result of the experimental group. Table 4.4 reveals that the average word use in the pretest was 51.91 words and in the posttest it was 51.48 words. The mean difference shows that posttest responses were shorter than the pretests (-0.43). The longest response in the posttest was item 5 which required participants to respond to a customer's request for changing their soup for being too salty. The average number of words used was 8.61 while the number in the experimental group was 13.69. The shortest response in the posttest of the control group was item 1 which was similar to the experimental group. Moreover, the average number was not much different; the control group was 4.09 and the experimental group was 4.18. The

differences of sentence length rank in order are items 5, 1, 4, 8, 3, 6, 2, and 7 respectively. Table 4.5 presents three groups of participants which were divided by their sentence length as longer, shorter, or no difference.

Table 4.5 Differences of Sentence Length and Score Achievement of the Control Group

Sentence Length	Average Score	Number of Participants	Percent
1) Longer (average difference 8.69 words)		13 participants	56.52%
• Score higher	5.37	9 participants	39.13%
• Score lower	-4.00	4 participants	17.39%
2) Shorter (average difference -13.75 words)		9 participants	39.13%
• Score higher	1.35	6 participants	26.09%
• Score lower	-1.67	3 participants	13.04%
3) No difference		1 participant	4.35%
• Score higher	0.67	1 participant	4.35%
• Score lower	-	-	-
	Total	23 participants	100%

The majority group of 13 participants (56.52%) responded in the posttest longer with average difference of 8.69 words. The minority group of 9 participants (39.13%) replied shorter with an average difference of -13.75 words. There was 1 participant (4.35%) who had no difference of sentence length in their responses. Furthermore, when dividing these groups according to their score achievement the data shows that 9 participants (39.13%) who gave longer answers gained higher scores at an average of 5.37. There were 4 participants (17.39%) who gave longer answers but scored lower at an average of -4.00. In the group of shorter answer, there were 6 participants (26.09%) who replied shorter but received a higher score of

1.35 in average, another 3 participants (13.04%) received a lower than average score of -1.67. There was only 1 participant (4.35%) who wrote the answers at the same length and received the higher score of 0.67. The next section presents the findings of differences between English proficiency before and after the implementation of these two groups according to four criteria.

4.2.4 Differences of English Proficiency According to the Four Criteria

For further investigation of English proficiency, all three raters were asked to rate the scores of each participants' responses specifically for four language criteria. The total score of each response was 20 points as it was assessed following the four criteria; task fulfillment (5 points), politeness and appropriacy (5 points), word choice (5 points), and grammatical form (5 points). Below are the criteria and meaning of each rating scale and the next section presents the findings of the median scores of pretest and posttest regarding these four criteria.

0 means not proficient in English, the answer gains the lowest value

1 means weak a level of English proficiency, the answer gains a low value

2 means a moderate level of English proficiency, the answer gains an average value

3 means a proficiency of English, the answer gains a high value

4 means very proficient in English, the answer gains a very high value

5 means excellent in English, the answer gains the highest value

Table 4.6 Median Scores of English Proficiency According to Four Criteria

Experimental Group	Pretest (Median)	(%)	Posttest (Median)	(%)	Median Diff.	(%) Diff.
Task Fulfillment	33.00	82.50%	34.00	85.00%	1.00	2.50%
Politeness and Appropriacy	29.33	73.33%	30.67	76.68%	1.34	3.35%
Word Choice	28.67	71.68%	29.00	72.50%	0.33	0.82%
Grammatical Form	28.33	70.83%	28.00	70.00%	-0.33	-0.83%
Control Group	Pretest (Median)	(%)	Posttest (Median)	(%)	Median Diff.	(%) Diff.
Task Fulfillment	25.67	64.18%	25.67	64.18%	0	0%
Politeness and Appropriacy	23.33	58.33%	23.00	57.50%	-0.33	-0.83%
Word Choice	21.67	54.18%	22.00	55.00%	0.33	0.82%
Grammatical Form	21.67	54.18%	23.00	57.50%	1.33	3.32%

Table 4.6 illustrates median scores of language proficiency of both groups. As can be seen, the participants from the experimental group could perform their language better in three specific areas. The highest difference is in politeness and appropriacy as the median difference was 1.34. It is a total contrast to the control group as this aspect went backwards as the different score was -0.33. The second highest was task fulfillment and the median difference was 1.00 whereas language performance of the control group in this criterion was not different (0). The third area was word choice and it is similar to the control group as their difference was 0.33 likely. The least development of language proficiency that the experimental group had made was grammatical forms (-0.33) which was totally different from the control group as it had the highest difference (1.33).

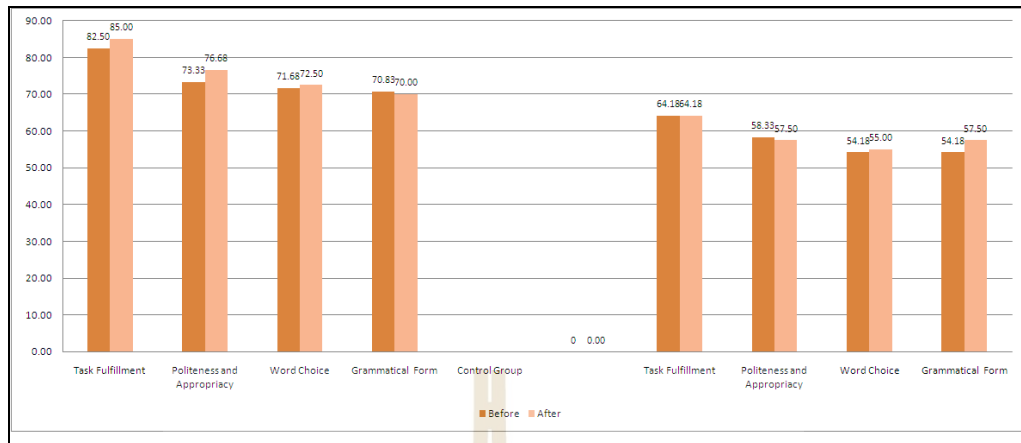


Figure 4.1 Differences of English Proficiency According to Four Language Criteria

This bar chart presents an overall picture of how participants performed English skills in the pretests and posttests. The graph shows that participants in the experimental group could develop their English skills better in three categories except the grammatical form. Their English was better by 5.84% in total when comparing the differences between pretest and posttest. Even though the number is quite small, it means that all 39 participants of the experimental group could learn English related to the restaurant business by themselves within 10 weeks without any instructions from the teacher. On the other hand, the control group who had studied English with an experienced teacher could improve their language skills by 3.31%. There was a commercial text being used as a teaching material. The course was conducted following the course outline as always practiced by the university. All participants in the control group had done exercise, assignments, homework, and prepared themselves for mid-term and final examinations. Apparently, they could improve their language skills in only two criteria; word choice and grammatical

form. The improvement and the regression of median scores of these two groups will be discussed more in the qualitative part.

4.2.5 Progress of English Proficiency after the Implementation

This section presents the progress of language performance from all the participants divided by levels of their language skills following four language criteria. English proficiency was ranked from the average scores of the pretest and posttest which were judged by three raters, and then they were calculated for percent. All participants' scores were distributed into six levels of English proficiency ranging from 0%– 100%.

Table 4.7 Progress of English Proficiency of the Experimental Group

Experimental Group	High			Low			Total N = 39
	Excellent (90%- 100%)	Very Proficient (80%- 89.99%)	Proficient (70%- 79.99%)	Moderate (60%- 69.99%)	Weak (50%- 59.99%)	Not Proficient (0%- 49.99%)	
Pretest							
Task Fulfillment	15.38%	43.59%	17.95%	5.13%	17.95%	0%	100%
Politeness and Appropriacy	2.56%	28.21%	38.46%	12.82%	7.69%	10.26%	100%
Word Choice	2.56%	20.51%	30.77%	20.51%	7.69%	17.95%	100%
Grammatical Form	2.56%	17.95%	38.46%	17.95%	7.69%	15.39%	100%
Posttest							
Task Fulfillment	23.08%	51.28%	10.26%	12.82%	2.56%	0%	100%
Politeness and Appropriacy	10.26%	23.08%	38.46%	17.95%	10.26%	0%	100%
Word Choice	5.13%	12.82%	43.59%	17.95%	17.95%	2.56%	100%
Grammatical Form	5.13%	15.38%	30.77%	35.90%	12.82%	0%	100%

Table 4.7 shows that participants from each level of English proficiency could develop their language skill even if they had never been instructed. Noticeably, the numbers identify that participants of all levels could make progress of their language skills in all areas. Firstly, in the task fulfillment criteria here were some participants (17.95%) of a weak level in the pretest but in the posttest there were only 2.56% left. Secondly, there were some participants who were considered not to be proficient in the other three areas of the pretest, but they improved their language skills in the posttest. The results show that all participants who were at first not proficient could perform better in politeness and appropriacy and grammatical forms. There were only 2.56% who were not proficient in the vocabulary area in the posttest. Thirdly, there were more participants who achieved the highest degree, excellent level, in all language criteria. When comparing the numbers of participant in the excellent level it reveals that the most different criteria were: task fulfillment (7.70%) and politeness and appropriacy (7.70%). For further analyzing it would be easier to interpret the data by grouping them as their levels of achievement. According to these six-score ranges it could be grouped into two levels: low and high. The low level was scores ranged from 0%– 69.99% and the high level was from 70%– 100%. The next part presents the English development of the experimental group according to these two groupings, of low and high achievement levels, in the bar graph.

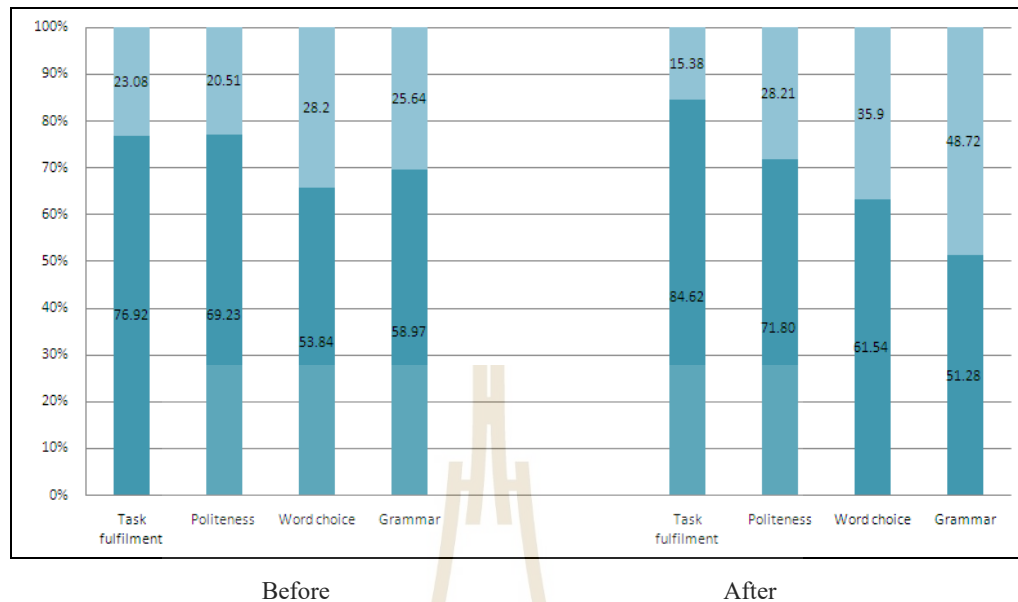


Figure 4.2 English Proficiency Before and After of the Experimental Group

When grouping them into two groups according to their levels of achievement, low and high, it could be noticed that they gained more proficiency in using English in three areas. These were task fulfillment, politeness and appropriacy, and word choice because the numbers of low achievement participants were lower. The highest differences were task fulfillment and word choice as the low achievement participants could develop themselves to be in the high achievement level equally (7.70%). Meanwhile, the area of politeness and appropriacy was different by only 2.57%. In contrary, the area of grammatical form did not correspond to that trend as the difference between pretest and posttest of the number of low achievement participants were higher at 7.69%. It seems that some participants of the high achievement level couldn't retain their levels of grammar in the posttest. The next part is the results of participants in the control group according to these four language criteria.

Table 4.8 Progress of English Proficiency of the Control Group

Control Group	High			Low			Total N = 23
	Excellent (90%- 100%)	Very Proficient (80%- 89.99%)	Proficient (70%- 79.99%)	Moderate (60%- 69.99%)	Weak (50%- 59.99%)	Not Proficient (0%- 49.99%)	
Pretest							
Task Fulfillment	0%	4.35%	26.09%	34.78%	26.09%	8.70%	100%
Politeness and Appropriacy	0%	4.35%	0%	34.78%	39.13%	21.74%	100%
Word Choice	4.35%	0%	0%	26.09%	39.13%	30.43%	100%
Grammatical Form	0%	0%	4.35%	17.39%	56.52%	21.74%	100%
Posttest							
Task Fulfillment	0%	8.70%	21.74%	21.74%	39.13%	8.70%	100%
Politeness and Appropriacy	0%	4.35%	4.35%	39.13%	13.04%	39.13%	100%
Word Choice	0%	0%	8.70%	21.74%	34.78%	34.78%	100%
Grammatical Form	0%	0%	13.04%	26.09%	30.43%	30.43%	100%

This table displays the development of language proficiency for the control group following those four language areas divided by a range of levels of English proficiency. Obviously, 4.35% of the participants who achieved the excellent level in the word choice of the pretest disappeared in the posttest. In the posttest, when looking at the group of not proficient participants the numbers show that there were more participants for three language criteria except the task fulfillment. The findings also revealed that there were three areas of language proficiency that participants in the low achievement level could improve their language skills to be better in the posttest. Similarly, it is easier to interpret the data by grouping these participants into two groups regarding the level of achievement. The next section illustrates the development of English skills of the control group in bar graph.

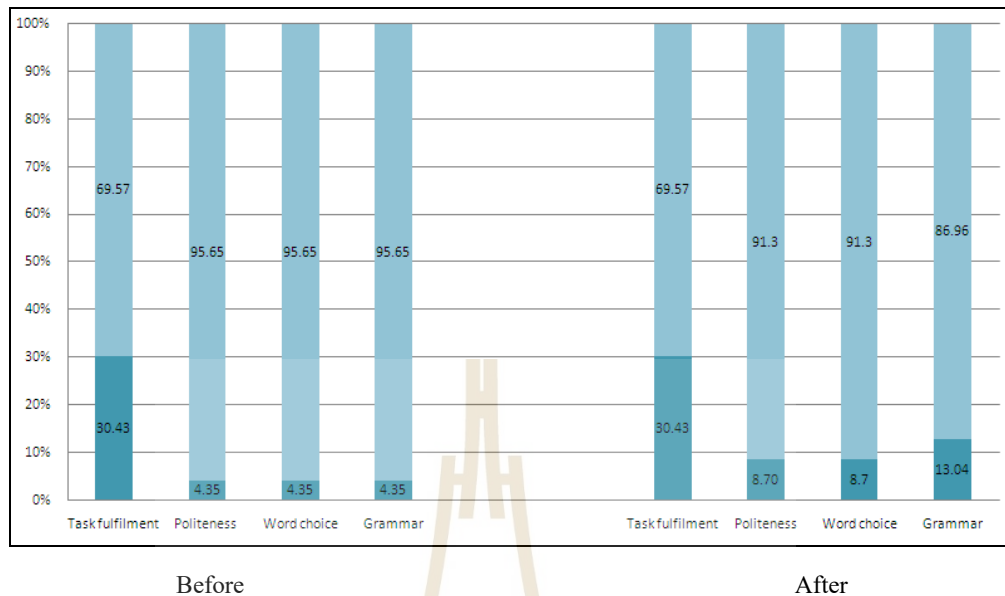


Figure 4.3 English Proficiency Before and After of the Control Group

This bar graph reveals that the performance of English skills of the control group was better in three areas; politeness and appropriacy, word choice, and grammatical forms. Task fulfillment remained the same as there was no difference in the scores of pretest and posttest. The highest difference was the grammatical form because there were more participants (8.69%) who moved from the low achievement level to the high level. The other two aspects; politeness and appropriacy and word choice, were similar as the difference was 4.35% equally. Interestingly, the results of the control group were quite different from the experimental group because most development of this group was about grammar knowledge while it was the least developed of the experimental group. In addition, the highest development of the experimental group was about task fulfillment but for the control group it was not different. The next part shows the results of Wilcoxon signed-rank test to investigate

the significant differences of language performances of the experimental and control groups in overall aspects and according to four language criteria.

4.2.6 Significant Difference of English Proficiency between Groups

To examine whether the control group or the experimental group was more progressive in English proficiency after the intervention; Wilcoxon rank-sum test was performed to investigate significant differences between their scores of posttests. Wilcoxon rank-sum test (also called Mann-Whitney U test) is a non-parametric test that is equivalent to two sample independent t-test. It is used to test the differences in ranks of median distribution which is suitable for the nature of the collected data of this study. The table below presents the results of the statistical testing.

Table 4.9 Wilcoxon Rank-Sum Test Results of Pretest Scores

Group	N	Mean Rank	Sum of Ranks	Z	P
Experimental Group	39	35.12	1369.5	2.58	0.0399
Control Group	23	25.37	583.5		
Total	62				(p > .01)

The statistic result shows that there was no significant difference in the overall pretest scores of both groups when comparing their English performance by using DCT assessments. It means that the English knowledge of participants from both groups was not different as p-value was higher than the critical value ($p = .0399$; $p > .01$).

Table 4.10 Wilcoxon Rank-Sum Test Result of Posttest Scores

Group	N	Mean Rank	Sum of Ranks	Z	P
Experimental Group	39	36.54	1425	2.85614	.00424
Control Group	23	22.96	528		
Total	62				(p <.01)

When comparing the DCT posttest scores from both groups by applying Wilcoxon rank-sum test, the results indicate that there was a significant difference between the two groups as the p-value was lower than the critical value ($p = .00424$; $p < .01$). It could be concluded that the null hypothesis H_0 is rejected. Therefore, there is enough evidence to claim that the median scores are different than 0, at the 0.01 significance level. The next part presents the result of Wilcoxon signed-rank test which identifies that there is a significant difference between pretest and posttest scores of the experimental group.

4.2.7 Significant Difference of English Proficiency within Groups

A series of Wilcoxon signed-rank test were conducted to examine the difference of English proficiency before and after the implementation. The Wilcoxon signed-rank test is a non-parametric statistic which can help to compare the differences of mean ranks from Likert-scale data. The Wilcoxon signed-rank test is equivalent to t-test so it can be used to determine whether the participants' English proficiency before and after the implementation was of a significant difference or not. The knowledge of English within the restaurant business of the participants in the experimental and control groups were assessed by eight situations of DCT both pretest and posttest. The tables below present the testing results of pretest and posttest of both groups separately.

Table 4.11 Wilcoxon Signed-Rank Test Comparison to Examine Differences of English Proficiency of the Experimental Group

Experimental Group	Posttest - Pretest	N	Mean Rank	Sum of Ranks	z	p
Overall	Negative Ranks	16 ^a	18.16	290.50	-1.389	.165
	Positive Ranks	23 ^b	21.28	489.50		
	Ties	0 ^c				
	Total	39				
Task Fulfillment	Negative Ranks	13 ^a	16.00	208.00	-2.358	.018**
	Positive Ranks	25 ^b	21.32	533.00		
	Ties	1 ^c				
	Total	39				
Politeness and Appropriacy	Negative Ranks	19 ^a	20.32	386.00	-.521	.603
	Positive Ranks	18 ^b	17.61	317.00		
	Ties	2 ^c				
	Total	39				
Word Choice	Negative Ranks	16 ^a	16.25	260	-1.381	.167
	Positive Ranks	21 ^b	21.10	443.00		
	Ties	2 ^c				
	Total	39				
Grammatical Form	Negative Ranks	19 ^a	17.97	341.50	-.421	.674
	Positive Ranks	19 ^b	21.03	399.50		
	Ties	1 ^c				
	Total	39				

a. Posttest < Pretest

b. Posttest > Pretest

c. Posttest = Pretest

This statistical testing was done with four components of language knowledge and the numbers were divided into four small fractions from the total scores. Therefore, the critical value 0.05 was applied to test the statistical significance of these four criteria. According to the table above, there is a significant difference between the criteria of task fulfillment ($z = -2.358$, $p = 0.018 < 0.05$) scores of the experimental group from before and after the implementation. When the rank sums of the difference scores are considered, it is seen that the observed difference is in favor of a positive rank (posttest) for the task fulfillment score. However, there was no any significant difference between the pretest

and posttest scores overall ($z = -1.389, p = 0.165 > 0.05$), politeness and appropriacy ($z = -0.521, p = 0.603 > 0.05$), word choice ($z = -1.381, p = 0.167 > 0.05$), and grammatical form ($z = -0.421, p = 0.674 > 0.05$). The next table shows the results of Wilcoxon signed-rank test comparisons of the pretest and posttest scores of the control group.

Table 4.12 Wilcoxon Signed-Rank Test Comparison to Examine Differences of English Proficiency of the Control Group

Control Group	Posttest - Pretest	N	Mean Rank	Sum of Ranks	Z	p
Overall	Negative Ranks	8 ^a	13.19	105.50	-.989	.323
	Positive Ranks	15 ^b	11.37	170.50		
	Ties	0 ^c				
	Total	23				
Task Fulfillment	Negative Ranks	11 ^a	11.45	126.00	-.016	.987
	Positive Ranks	11 ^b	11.55	127.00		
	Ties	1 ^c				
	Total	23				
Politeness and Appropriacy	Negative Ranks	7 ^a	12.14	85.00	-1.062	.288
	Positive Ranks	14 ^b	10.43	146.00		
	Ties	2 ^c				
	Total	23				
Word Choice	Negative Ranks	8 ^a	12.19	97.50	-1.233	.217
	Positive Ranks	15 ^b	11.90	178.50		
	Ties	0 ^c				
	Total	23				
Grammatical Form	Negative Ranks	9 ^a	10.39	93.50	-1.354	.176
	Positive Ranks	14 ^b	13.04	182.50		
	Ties	0 ^c				
	Total	23				

- a. Posttest < Pretest
- b. Posttest > Pretest
- c. Posttest = Pretest

According to the results of Wilcoxon signed-rank test of the control group, there was no significant difference in any of the criteria of both DCT assessments. There was not a significant difference between pretest and posttest scores overall ($z = -0.989$, $p = 0.323 > 0.05$), task fulfillment ($z = -0.016$, $p = 0.987 > 0.05$), politeness and appropriacy ($z = -1.062$, $p = 0.288 > 0.05$), word choice ($z = -1.233$, $p = 0.217 > 0.05$), and grammatical form ($z = -1.354$, $p = 0.176 > 0.05$). The next part presents the qualitative results with a discussion for supporting the quantitative results in order to answer the first research question.

4.2.8 Discussion of the Quantitative Results on Language Differences

The quantitative results point out that the participants of the experimental group improved their English skill better than the participants of the control group in the overall performance in specific areas. This section is dedicated to the discussion of the findings that indicate the differences of the language of both groups of participants. The implementation was conducted in the course of English for Restaurant and Catering Services for ten weeks. Participants of the experimental group had learned the language through MacroSIM without any instruction from the teacher. On the other hand, the control group had learned the same course with an experienced teacher. This ESP course was scheduled for them weekly for three-50 minutes periods. Their

English proficiency was assessed by pretests and posttests for examining language differences after the implementation. Their scores were analyzed quantitatively and the findings show that their language was of significant difference.

Overall their posttest scores indicate that the English improved for both groups. When comparing between groups, the median difference of the experimental group scores was higher (2.01) while the median difference of the control group was 0.67. Although the difference of pretest and posttest scores was not much different but it shows that the experimental group improved using the language more than the control group. Moreover, the ranges of medians of posttest scores also revealed that the participants of the experimental group performed their English skills in a more homogeneous manner. The range of medians in the posttest scores of the experimental group was tighter; pretest (102.00– 130.00) and posttest (108.00– 130.00), which means that their English learning was consistent. Whereas the range of medians in the posttest scores of the control group were more dispersed; pretest (79.33 - 103.00) and posttest (67.00 - 105.33), that means English performance of the participants of the control group were less consistent.

In addition, it can be noticed that there were some differences in pretest and posttest responses between these two groups in terms of sentence

length. Posttest responses of the experimental group were longer as their mean difference was 11.31 whereas the control group's mean difference of sentence length was -0.43. All participants' responses were evaluated by three experts on four specific areas separately they were; task fulfillment, politeness and appropriacy, word choice, and grammatical form. When compared in detail, these two groups had several differences according to the pretest and posttest scores. English performance of the experimental group was better in three areas which were task fulfillment, politeness and appropriacy, and word choice. On the contrary, their score of English in the aspect of grammatical form decreased. For the control group, their pretest scores were higher in two areas which were word choice and grammatical form. The score of task fulfillment for the control group was not different and their scores for politeness and appropriacy were lower.

Furthermore, their scores for pretest and posttest were tested statistically to determine the significant differences between their English before and after the implementation. A series of Wilcoxon signed-rank test were conducted and the results show that there were not significant differences between the overall scores of pretest and posttest assessments for both groups. The overall score of the experimental group was not significant ($z = -1.389$, $p = 0.165 > 0.05$). Similarly, the result of the control group also revealed that there

was no significant difference ($z = -0.989$, $p = 0.323 > 0.05$). When performing the statistic testing for specific areas of language use, the results identified that there was a significant difference of English use by the participants of the experimental group. The results show that after ten weeks the language use of the experimental group was significantly different in terms of task fulfillment specifically. However, the testing results of the four language criteria of the control group scores were not significantly different in any aspect. This means the implementation of MacroSIM resulted in the different use of English between participants of these two groups significantly.

4.3 Qualitative Results of English Differences

English knowledge can be viewed in many perspectives; this study focuses on language performance that reflects actual language knowledge when these participants use their language skills to convey their meanings. Qualitative results were analyzed from all participants' responses in eight situations in the DCT pretest and posttest in order to see how different their language skills were before and after the experiment. The aim of the analysis was to compare the pretest and posttest responses based on differences of the language used to convey meanings. Therefore, the scores which were evaluated by those three experts were not included for analysis.

The qualitative results were divided into two groups of language differences to answer the first research question. Firstly, the results of emerging language patterns which were analyzed qualitatively from the DCT responses are presented to demonstrate differences of English use before and after the implementation. Second, the differences of language proficiency regarding four language criteria were examined to give more view of participants' development of English skill in detail. The discussion part is also presented at the end of the section.

4.3.1 Differences of English Use

Eight responses of the pretest and posttest assessments from all participants were analyzed qualitatively to investigate the differences of their use of English before and after the implementation. The comparisons were performed on the pretest and posttest responses only from the ones that replied correctly to the given situations. The responses that were incorrect, either in the pretest or posttest because of misinterpretation of the task, were not counted. It was found that there were seven emerging patterns of the language differences. They used more politeness, gave more explanation or details, gave suggestion, used alternative sentences or phrases, used spoken language features, used alternative vocabularies, and applied new vocabularies. These language patterns can be grouped into two characteristics of English knowledge; adding more meaning and choice of vocabulary.

Table 4.13 Emerging Language Patterns after the Implementation

Emerging Language Patterns		Experimental Group		Control Group	
		Frequency (%)	Number of Participant	Frequency (%)	Number of Participant
A)	Enriching and complexifying the more meanings to be communicated. Students				
	1. Provided more politeness feature	58	28 (71.79%)	19	15 (65.22%)
	2. Provided more explanation or details	61	28 (71.79%)	17	9 (39.13%)
	3. Made suggestions	11	10 (25.64%)	2	2 (8.70%)
	4. Used a variety of alternative sentences or phrases	34	20 (51.28%)	21	11 (47.83%)
	5. Used spoken language features	38	27 (69.23%)	8	3 (13.04%)
	Sum	202	113 (289.74%)	67	40 (173.91%)
B)	Providing wide range of vocabulary. Students				
	1. Used alternative vocabularies	8	7 (17.95%)	0	0 (0%)
	2. Drew on and applied new vocabularies	7	6 (15.38%)	4	3 (13.04%)
	Sum	15	13 (33.33%)	4	3 (13.04%)
	Total	207	126 (323.08%)	76	43 (186.96%)

It was found that both groups of participants had changed many things in their use of English to reply to all eight situations in the posttest assessments. The data shows that participants in the experimental group changed their posttest responses more frequently (207 times) than those participants in the control group (76 times). The findings of the experimental group indicate that the highest frequency was about giving more explanation or details (61 times) and the lowest frequency was applying new vocabularies (7 times). For the control group the highest frequency was about using a variety of alternative sentences or phrases (21 times) but there was no evidence found that

the control group made use of alternative vocabularies (0 time). Their attempts were successful as the data in table 4.1 identifies that their median scores in the posttests were higher for both groups. However, the results show that there were more participants in the experimental group had changed their posttest responses (323.08%) than those of the control group (186.96%). Some samples of participants' responses according to these findings are presented below; beginning with the experimental group first and followed by the control group. These samples were retyped exactly from the participants' responses in the DCT assessments so there were some grammatical mistakes and misspelled words as they were written in the answer sheets.

4.3.1.1 Qualitative Results of Emerging Language Patterns of the Experimental Group

A) Enriching and complexifying more meanings to be communicated

There were four distinct language patterns found when participants wanted to convey more meanings in their responses which were providing more politeness features, providing more explanations or details, making suggestion, and using alternative sentences or phrases. This group of language differences was coded as enriching and complexifying more meanings to be communicated. The findings of these language differences were presented as samples below.

1) Providing politeness feature

It was found that there were 28 participants in the experimental group who added more linguistic features to show politeness in their posttest responses than in their pretest. The data shows that there were 58 frequencies; and it was ranked at the second highest difference of all the findings.

• Participant number 14

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: *I'm really sorry that tell you which the restaurant non-smoking but the restaurant have another place for smoking.*

Posttest response: *I'm terribly sorry sir. Our restaurant has rules don't smoking in restaurant but our restaurant has places for smoking around car park. I'm sorry again for inconvenience.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.67	3.00	2.67	13.67
Posttest	5.00	4.67	4.00	3.67	17.34

• Participant number 28

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: *No, thank you.*

Posttest response: *I am really sorry. I don't need that. Thank you so much.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.00	2.00	2.33	9.33
Posttest	3.67	3.67	3.67	4.00	15.01

• **Participant number 30**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: Sorry sir, we can't allow you smoking in there.

Posttest response: Excuse me sir, our restaurant can't allow customer smoking in there and you can smoking at outside. Thank you.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	2.33	2.00	2.33	10.33
Posttest	4.33	4.33	4.33	3.33	16.32

• **Participant number 32**

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Can you please register here.... and I'll ask you some questions.

Posttest response: Oh hello, could you please visit us at XXX restaurant for more interview. Thanks for call us.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.67	3.00	2.67	3.33	11.67
Posttest	5.00	4.67	4.33	4.33	18.33

• **Participant number 38**

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: I'm terribly sorry for that. I going to bring the new one for you.

Posttest response: I'm terribly sorry for that. I'll bring new one for you. Please, wait a second.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	4.00	4.00	4.33	17.66
Posttest	5.00	5.00	5.00	4.33	19.33

2) Providing more explanation or details

In the posttest responses there were some participants who wrote longer sentences than in the pretest. It was found that many participants replied longer by adding more sentences to explain or give more information to respond to the situation. This emerging language pattern was most frequently found in the data of the experimental group. It was used 61 times by 28 participants. Here are some samples.

- **Participant number 4**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: *I'm not familiar with this food.*

Posttest response: *Thank you. But I'm vegetarian. Do you have any dishes without meat?*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.00	3.00	3.33	13.00
Posttest	5.00	5.00	5.00	5.00	20.00

- **Participant number 12**

Situation 3: You are a customer in a café. You order a drink and when the waitress brings you the drink, she spills it over your new dress.

Pretest response: *No problem.*

Posttest response: *No problem. But I want to change the new dress because I have a meeting. Can you help me?*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.00	4.00	4.00	16.33
Posttest	4.33	3.67	3.67	3.67	15.34

• **Participant number 25**

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Hi, I'm Sriploy and looking for a part-time waiter/waitress. Did you have experience in café before?

Posttest response: Can you come to my café tomorrow? For interview that position. I will waiting to see you tomorrow and thank you for your interested.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.00	3.00	3.00	12.67
Posttest	4.67	4.67	4.33	3.67	17.34

• **Participant number 28**

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: OK. Tomorrow Can you come to my café? I want to interview you. So, What's name?

Posttest response: Hello, On 10 July 2017 Can you come to my café. I will interview you. Thank you so much for calling.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.67	4.33	4.00	17.67
Posttest	5.00	5.00	5.00	5.00	20.00

• **Participant number 30**

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: You have experience for waitress.

Posttest response: *Oh, ok. You can walk in for apply at my café on Monday – Friday at 6 am until 7 pm.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	1.00	1.33	1.33	1.00	4.67
Posttest	4.33	4.33	4.33	3.67	16.66

3) Making suggestion

Making suggestion was found only 11 times from 10 participants. Mostly, they were found in situation eight when participants wanted to explain more about the rule of the non-smoking area of the restaurant and they tried to offer another place to smoke.

• Participant number 3

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: *Sorry, Do not smoke here.*

Posttest response: *Sorry. This area is not smoking you can smoking outside.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.33	2.67	2.67	3.67	12.33
Posttest	3.00	3.00	2.67	2.33	11.00

• Participant number 14

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: *I'm really sorry that tell you which the restaurant non-smoking but the restaurant have another place for smoking.*

Posttest response: *I'm terribly sorry sir. Our restaurant has rules don't smoking in restaurant but our restaurant has places for smoking around car park. I'm sorry*

again for inconvenience.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.33	2.00	1.67	1.67	7.67
Posttest	4.00	3.67	3.00	3.33	14.00

- **Participant number 25**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: Excuse me sir/madam. In restaurant's can't smoking please follows me this way for smoking.

Posttest response: Excuse me, this is no smoking area. Can you change room this way I have happy room for smoking. Thank you sir.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	2.67	2.67	2.67	12.34
Posttest	3.67	3.00	2.67	2.67	12.01

- **Participant number 33**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: Excuse me sir. The toilet have a smoking area.

Posttest response: Excuse me sir. This here non smoke but you can smoke in this place. It near toilet.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.33	2.00	1.67	1.67	7.67
Posttest	4.00	3.67	3.00	3.33	14.00

- **Participant number 38**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: Excuse me sir/mam. This area is not allow for smoking.

Posttest response: Excuse me sir/mam. This area not allowed to smoke. The area that is available is outside.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.33	3.33	3.33	14.33
Posttest	4.67	4.33	4.33	3.67	17.00

4) Using a variety of alternative sentences or phrases

This item was the third frequency which was found 34 times out of 20 participants. It happened when the participants wanted to change the sentence but keep the same meaning. It includes the ones that were changed for a better response of the situation.

• Participant number 5

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: Yes, sir. I will change it for you.

Posttest response: Sorry, sir. I'll fix it immediately and not let it happen again.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.67	4.67	4.67	18.33
Posttest	4.00	3.67	3.33	3.00	14.00

• Participant number 11

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Ok. Please enter your application.

Posttest response: Ok. We'd like to invite you coming here to have an interview.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	3.33	2.67	2.67	11.67
Posttest	5.00	4.67	4.33	4.00	18.00

- **Participant number 25**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you so much. You're welcome because customer is God.

Posttest response: Thank you so much. I would made food from my heart.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	2.33	2.00	2.67	10.67
Posttest	4.67	4.00	4.00	3.67	16.34

- **Participant number 30**

Situation 3: You are a customer in a café. You order a drink and when the waitress brings you the drink, she spills it over your new dress.

Pretest response: Thank you very much, please come again later.

Posttest response: Thank you very much, I hope you come again.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	4.33	4.33	4.33	18.00
Posttest	5.00	5.00	5.00	5.00	20.00

- **Participant number 37**

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: You can come to interview tomorrow.

Posttest response: *Oh. Ok. You can come to the café to apply.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.33	3.00	3.00	13.00
Posttest	4.33	4.00	3.33	3.67	15.33

5) Using spoken language feature

Participants in the experimental group used more spoken language features in their posttest responses than in their pretest. It was found 38 times out of 27 participants.

• Participant number 7

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: *Thank you for your compliments. I'm so glad to hear that. I will intend to cook.*

Posttest response: *Wow, Thank you very much.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	4.33	4.00	4.67	18.00
Posttest	5.00	4.67	4.67	5.00	19.33

• Participant number 14

Situation 3: You are a customer in a café. You order a drink and when the waitress brings you the drink, she spills it over your new dress.

Pretest response: *That all right. But you take me a toilet.*

Posttest response: *Ah. Don't worry about that but you take me go to clean my dress.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.33	3.33	3.00	13.99
Posttest	4.67	3.67	4.00	3.00	15.34

- **Participant number 16**

Situation 3: You are a customer in a café. You order a drink and when the waitress brings you the drink, she spills it over your new dress.

Pretest response: Don't worry, and where I can change my dress?

Posttest response: Oh god, that's ok. And I would like you to find some dress that I can change now. And of course, please bring me to the bathroom.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.33	4.33	3.67	16.66
Posttest	3.67	3.67	3.67	3.67	14.67

- **Participant number 35**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you so much. Have a join your meal.

Posttest response: Oh, really! Thank you so much. Hope you enjoy a meal.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	2.66	2.00	11.99
Posttest	5.00	5.00	5.00	5.00	20.00

- **Participant number 38**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: It's nice dish, but thank you.

Posttest response: Oh nice. It's interesting. But not for today, I need to have pork shop.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.00	3.33	3.00	3.00	11.33
Posttest	5.00	4.33	4.33	4.33	17.99

B) Providing wide range of vocabulary

This group of emerging language patterns was considered as English vocabulary knowledge and it shows that participants had a proper understanding of these vocabulary meanings. Although the numbers were quite small, they could apply the vocabularies appropriately within the context. The results can be divided into two groups; using alternative vocabularies, drawing on and applying new vocabularies as samples demonstrate below.

1) Using alternative vocabularies

This item was found only 8 times out of 7 participants; it was the second least frequent from the analysis. It shows that the participants had more choice of vocabulary to use in the sentence that still conveyed the same meaning.

- **Participant number 4**

Situation 3: You are a customer in a café. You order a drink and when the waitress brings you the drink, she spills it over your new dress.

Pretest response: Don't worry. I want a *tissue paper*.

Posttest response: Oh. No problem. I'm okay. I get *napkin*.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	4.67	4.33	4.00	18.00
Posttest	5.00	4.67	4.67	4.00	18.33

- **Participant number 4**

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Your wellcome, Please meet me at the café to interview on tomorrow, Are you **comfortable**?

Posttest response: I'm looking for you I want to interview you tomorrow, Is **convinient** for you.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.33	3.33	3.33	15.67
Posttest	4.33	4.00	4.00	4.00	16.33

- **Participant number 10**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you for your **compliment**.

Posttest response: Thank you very much for the **praise**. We will develop more and more.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.67	3.33	3.67	15.00
Posttest	4.67	4.33	4.33	4.00	17.33

- **Participant number 14**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: Thank you for your **offer** special dish, but I would like chicken steak.

Posttest response: Thank you for **suggests** of special dish but I would like to chicken steak.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.00	4.33	3.33	16.33
Posttest	5.00	5.00	4.33	4.00	18.33

- **Participant number 32**

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: *I'm really sorry about that! Can I bring new one for you.*

Posttest response: *I'm really sorry for that, I'll change a new one for you.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.33	4.00	3.67	16.33
Posttest	5.00	5.00	5.00	4.33	19.33

2) Drawing on and applying new vocabularies

This item was the least frequent; it was found only 7 times out of 6 participants. These new vocabularies were applied intentionally, and they made their sentences convey the meanings more directly to the point.

• Participant number 1

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: *Sorry. Do not smoking here.*

Posttest response: *Sorry, for the inconvenience, you can't smoking in there.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.33	2.67	2.67	12.34
Posttest	4.00	3.33	3.00	2.67	13.00

• Participant number 4

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: *I'm not familiar with this food.*

Posttest response: *Thank you. But I'm vegetarian. Do you have any dishes without meat?*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.67	2.67	3.00	3.33	11.67
Posttest	5.00	5.00	5.00	5.00	20.00

- **Participant number 5**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: Oh! Thank, but I would like to chicken steak and orange juice.

Posttest response: Thank you, but I would like **sirloin** steak.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	5.00	5.00	4.00	19.00
Posttest	5.00	5.00	5.00	5.00	20.00

- **Participant number 5**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: Excuse me. It's not around to smoke here.

Posttest response: Excuse me sir. Smoking is not **permitted** in this area.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.33	2.67	2.67	12.33
Posttest	4.33	3.67	3.67	4.00	15.70

- **Participant number 27**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you.

Posttest response: Thank you for **compliments**.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	2.33	2.33	2.00	10.33
Posttest	5.00	4.67	4.67	5.00	19.34

These qualitative findings show that the experimental group tried to use several strategies of English knowledge to create sentences in the

posttest differently from the pretest. Obviously, their language changing resulted in higher scores. Next, the findings of the participants' responses of the control group are presented according to these seven emerging language patterns.

4.3.1.2 Qualitative Results of Emerging Language Patterns of the Control Group

The result from the table 4.3 reveals that the control group's posttest responses were less different (3.09%) than the experimental group (5.56%). The percent of frequent differences was lower than the results of the experimental group in all items except using alternative sentences or phrases. The most language differences rank from using alternative sentences or phrases (0.91%), using more politeness (0.83%), giving more explanations or details (0.74%), using spoken language features (0.35%), applying new vocabularies (0.17%), giving suggestion(0.09%), but there was no evidence of using alternative vocabularies (0%).

A) Enriching and complexifying the meanings to be communicated

Similarly to the experimental group, this group of emerging language pattern found five characteristics; proving more politeness features (0.83%), proving more explanations or details (0.74%), making suggestion (0.09%), using alternative sentences or phrases (0.91%), and using spoken language features (0.35%). Some samples of participants' responses are presented below to illustrate the differences.

1) Providing more politeness feature

This item was the second frequent of difference; it was found 19 times from 15 participants and it could be calculated as 0.83%.

- **Participant number 7**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: Do you have any other dish.

Posttest response: No, I don't like. Thank you so much.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.67	2.67	3.00	11.33
Posttest	3.67	2.67	2.33	2.67	11.33

- **Participant number 7**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: Certainly, sir/madam.

Posttest response: I'm sorry madam, and I will change it just a moment please.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.67	3.67	14.67
Posttest	5.00	5.00	4.67	4.67	19.33

- **Participant number 8**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: What about if we have a pork shop?

Posttest response: I'm afraid, I can't eat them.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.33	3.67	14.33
Posttest	3.00	2.67	2.67	3.00	11.33

- **Participant number 12**

Situation 1: You are a customer who is sitting in a pizza shop. After you finish having your meal and you want the waiter to bring you the bill.

Pretest response: Could I have the bill please.

Posttest response: Excuse me, I would like to the bill, pleas.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.67	4.00	4.67	17.67
Posttest	3.67	4.00	2.33	2.67	12.67

- **Participant number 13**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: My pleasure madam.

Posttest response: Thank you madam. My pleasure.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	2.33	2.33	2.00	10.33
Posttest	5.00	4.67	4.67	5.00	19.34

2) Providing more explanation or details

Giving more explanation or details was found 17 times out of 9 participants. It was ranked the third most frequent difference in this group.

- **Participant number 10**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you so much.

Posttest response: Thank you for your compliments. Please come back again.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	2.33	2.33	2.00	10.33
Posttest	5.00	4.67	4.67	5.00	19.34

- **Participant number 13**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest: omg. that's fine not angry on you.

Posttest: omg.(angry)but it's ok. I forgive you.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.00	3.67	4.00	16.33
Posttest	3.33	2.67	3.00	3.33	12.33

- **Participant number 16**

Situation 1: You are a customer who is sitting in a pizza shop. After you finish having your meal and you want the waiter to bring you the bill.

Pretest: Bill please.

Posttest: How much of order and I will check bill.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	5.00	5.00	5.00	20.00
Posttest	2.67	2.33	1.67	2.33	9.00

- **Participant number 23**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest: it's okay. never mind that.

Posttest: Never mind, I have a new dress to change.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	3.00	3.00	3.00	12.00
Posttest	4.67	4.00	4.00	4.33	17.00

- **Participant number 23**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which s against the restaurant’s rules. You need to tell him.

Pretest response: Excuse me! Don't smoke here, you should smoking in smoking area.

Posttest response: Excuse me, sir. The hotel are not allow to smoke. **Could you go out to smoke zone please.**

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	2.67	2.67	2.67	12.01
Posttest	4.67	4.33	4.00	3.67	16.67

3) Making suggestion

There were only two samples for this item for the control group. It was found only 2 times out of 2 participants in the same situation.

- **Participant number 10**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which s against the restaurant’s rules. You need to tell him.

Pretest response: Excuse me. Please don't smoking in the hotel.

Posttest response: Excuse me! Don't smoke here. **You should smoke in smoking area or outside, sir.**

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.33	3.00	13.67
Posttest	4.00	2.67	2.67	3.33	12.67

- **Participant number 16**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been

smoking at his table which s against the restaurant's rules. You need to tell him.

Pretest response: Excuse me. no smoking here.

Posttest response: Sorry sir, this here don't smoking. You can smoking at the toilet.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.00	3.00	3.33	13.67
Posttest	3.67	2.67	2.67	2.67	11.67

4) Using a variety of alternative sentences or phrases

This item was the highest difference of the control group, it was found 21 times out of 11 participants.

- Participant number 4

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: Thank you, It's very nice but I don't like it.

Posttest response: Thank you but I'm on diet.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.33	3.33	3.67	14.67
Posttest	5.00	4.33	4.67	4.67	18.67

- Participant number 4

Situation 7: You are a manager of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: OK, give me your information. I will call you back later.

Posttest response: Please leave number telephone, I will call you back later.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	4.00	3.67	4.00	15.67
Posttest	3.33	3.00	2.67	3.00	12.00

- **Participant number 8**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: *oh, Yes, I will tell the chef to make you new soup.*

Posttest response: *I'm sorry I will tell the chef to chang its.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.33	3.67	14.33
Posttest	4.00	3.67	3.67	3.67	15.01

- **Participant number 23**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: *I would like to have others dishes please.*

Posttest response: *I don't like it. May I order other food.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.33	3.00	3.00	3.67	13.00
Posttest	3.00	3.00	3.00	3.00	12.00

- **Participant number 23**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: *Yes ma'm. I will tell the chef about that. Please be patient.*

Posttest response: *Sure, I'll tell the chef to cook the new soup to you.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.33	3.33	4.00	14.99
Posttest	4.67	3.33	4.00	4.00	16.00

5) Using spoken language features

Spoken language features were found only 8 times out of 3 participants in their posttest responses. The number was not much different when comparing it with the pretest as they were found only 4 times out of 3 participants.

- **Participant number 5**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest: Don't worry.

Posttest: Oh, I'm ok but your check yourself.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.33	3.33	3.33	3.33	13.33
Posttest	3.33	3.00	3.00	2.33	11.67

- **Participant number 5**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty?

Pretest response: OK, I'm a change it.

Posttest response: Well, I to change the soup. Just a moments.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.67	2.67	2.67	2.33	10.33
Posttest	2.33	2.33	2.33	2.33	9.33

- **Participant number 16**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest: It's ok.

Posttest: *Oh, Never mind.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.33	2.33	2.67	10.33
Posttest	4.00	3.67	3.67	3.67	15.00

- **Participant number 16**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: *Yes. Thank you so much.*

Posttest response: *Oh, Relly. Thank you madam.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	3.67	3.67	4.00	16.01
Posttest	5.00	4.33	4.67	4.33	18.33

- **Participant number 16**

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: *I'm sorry. I clean on the fork now.*

Posttest response: *Oh, I'm sorry and I will change it now.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.33	2.33	2.67	10.33
Posttest	5.00	5.00	5.00	5.00	20

B) Proving a wide range of vocabulary

English vocabulary knowledge of the control group was not much different when comparing it between pretest and posttest responses. The findings show that there were only 4 differences found which were all about applying new

vocabularies (0.17%). There was no evidence of using alternative vocabularies in all posttest responses of the control group.

1) Using alternative vocabularies

There was no evidence of this item from the control group.

2) Drawing on and applying new vocabularies

There were only 4 new vocabularies found in the posttest responses out of 3 participants in the control group for this item.

- Participant number 3

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you very much.

Posttest response: Thank you for **compliment**, sir.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.33	4.33	4.67	17.67
Posttest	5.00	4.67	4.67	4.33	18.67

- Participant number 7

Situation 7: You are a manager of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Ok, write your information at here.

Posttest response: Yes. You have to come to the café for write **application form**.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.00	3.00	13.33
Posttest	4.00	4.00	4.00	4.00	16.00

- **Participant number 7**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which s against the restaurant's rules. You need to tell him.

Pretest response: Excuse me, at here is non-smoking zone.

Posttest response: Sorry, sir. This area is **prohibit** smoking but you can smoke it outside.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.33	2.67	2.67	2.00	10.67
Posttest	4.67	4.67	4.33	4.33	18.00

- **Participant number 10**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you so much.

Posttest response: Thank you for your **compliments**. Please come back again.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	2.33	2.33	2.00	10.33
Posttest	5.00	4.67	4.67	5.00	19.34

These samples demonstrate how participants in the control group changed their language performance after ten weeks of the experiment. It could be seen that their English in the posttest responses was not much different from the pretest. Their posttest responses were quite short when comparing them with posttest responses of the experimental group. Sentence length of the posttest responses from participants of the experimental group was obviously longer than those the control group. Next, the results of qualitative analysis of DCT responses regarding four language criteria are presented.

4.3.2 Differences of Language Proficiency Regarding Four Language

Criteria of the Experimental Group

The table below presents percent of the participants and their score achievement of each criterion base on score differences between pretest and posttest assessments. The results give more insightful information about how participants in the experimental group performed in their DCT posttest. The explanation is described in detail for each language area. Language assessment was divided into four criteria; task fulfillment, politeness and appropriacy, word choice, and grammatical form. These four criteria act as four perspectives to assess participants' responses on each situation. The criteria help to explain participants' language proficiency comprehensively and how each participant had tried to perform their English skills on the assessments. Each criterion has a score of 40 all together 4 areas, so the total score was 160. Qualitative results are presented according to these four criteria respectively.

Table 4.14 Comparison of Pretest and Posttest Scores of the Experimental Group

Experimental Group	Score Higher		Score Lower		No Difference		Total (n = 39)
	Percent	Average Different Score	Percent	Average Different Score	Percent	Average Different Score	
Task Fulfillment	64.10% (25)	3.88	33.33% (13)	-1.92	2.57% (1)	0	100%
Politeness and Appropriacy	64.10% (25)	3.32	35.90% (14)	-2.81	0% (0)	0	100%
Word Choice	53.85% (21)	4.52	41.03% (16)	-2.85	5.18% (2)	0	100%
Grammatical Form	48.72% (19)	9.12	51.28% (20)	-7.98	0% (0)	0	100%

1) Task Fulfillment

Task fulfillment was used to assess participants' interpretation of meanings when they had read the situations. If they perceived the meaning correctly, they could give an answer properly to the situation. According to the table 4.6, task fulfillment had the second highest median difference (1.00). Table 4.15 identifies that over half of participants (64.10%) could achieve higher posttest scores than the pretest and the average higher score was 3.88. In contrary, 33.33% of participants scored lower with the average lower score of -1.92. Some participants (2.57%) scored exactly the same in the pretest and posttest. The top five highest score differences were 13.34, 9.33, 9.33, 7.00, and 6.66. Below are samples of responses from the participants who achieved higher scores in their posttest according to task fulfillment.

- **Participant number 33**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: *our customer want the soup a little bit salty*

Posttest response: *Yes madam, I will told to chef and change to you, Just a moment Please.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0	0	0	0	0
Posttest	4.67	4.67	4.33	3.33	17.00

- **Participant number 31**

Situation 3: You are a customer in a café and you order a drink with a waitress.

When she brings you the drink, she spills it all over your new dress.

Pretest response: Ok. I will ordered in a café and I sorry for I take another drink come to the café.

Posttest response: Don't worry about it.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0	0	0	0	0
Posttest	4.67	4.33	4.33	4.33	17.67

- Participant number 28

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean. Pretest response: Excuse me. This fork is not clean. Is it possible to chang it?

Posttest response: I am really sorry about that. I will change the new fork for you, just a moment sir.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0	0	0	0	0
Posttest	5.00	5.00	5.00	4.67	19.67

- Participant number 34

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which s against the restaurant's rules. You need to tell him.

Pretest response: Sorry! Wait a minute, I'll tell him.

Posttest response: excuse me, at the restaurant don't smoking.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0	0.33	0	0.33	0.66
Posttest	3.33	2.33	2.33	2.33	10.30

- Participant number 24

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: *Do you can change the fork for me?*

Posttest response: *I'm sorry and change fork for you.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0.33	0.33	0.33	0.33	1.32
Posttest	4.67	4.00	3.67	3.00	15.33

As can be seen, these participants could interpret the meanings of the situations in the posttest more correct than in the pretest. Even though they had made some incorrect grammar and misspelling some words but their attempts to give answers improved. Moreover, the given scores of the pretest and posttest obviously show that the ability of using English language to accomplish the task intervenes scores of other areas as well. That means if the expectation of the raters was not met, its result effects the whole production of the language.

2) Politeness and Appropriacy

Politeness and appropriacy are context-bound knowledge; it is a language strategy that is chosen to apply in the language in order to respond on a particular situation. This criterion assessed English skills of each participant in the sense of pragmatic knowledge. When comparing pretest and posttest scores on this aspect, 64.10% of participants could achieve a higher score and 35.90% of participants scored lower. The average higher score was 3.32 and the average lower score was -2.81. The median difference of this criterion was the highest (1.34) according to the table 4.6. The top five highest score differences were 14.00, 9.00,

8.34, 7.67, and 7.00. Below are some samples of pretest and posttest responses for comparison.

- **Participant number 2**

Situation 3: You are a customer in a restaurant and you order a drink with a waitress. When she brings you the drink, she spills it all over your new dress.

Waitress: Oh, I'm really sorry about that!

Pretest response: Don't worry. Not at all.

Posttest response: Don't worry. I know situation this is a accident.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.00	3.33	13.66
Posttest	4.67	4.67	4.33	3.33	17.00

- **Participant number 11**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest: Yes, madam I could tell the chef and chang it.

Posttest: Oh. I'm really sorry about that. And I will change the soup and I will tell to chef that is salty.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.67	3.67	3.33	15.00
Posttest	5.00	4.67	4.33	4.00	18.00

- **Participant number 14**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: I'm really sorry that tell you which the restaurant non-smoking but

the restaurant have another place for smoking.

Posttest response: *I'm terribly sorry sir. Our restaurant has rules don't smoking in restaurant but our restaurant has places for smoking around car park. I'm sorry again for inconvenience.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.33	2.00	1.67	1.67	7.67
Posttest	4.00	3.67	3.00	3.33	14.00

- Participant number 24

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: *You are not smoking in the restaurant because smell bad.*

Posttest response: *Umm... you can smoking out restaurant please.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.33	1.33	1.66	1.66	7.32
Posttest	3.67	3.00	2.33	2.67	11.70

- Participant number 28

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

Pretest response: *Excuse me sir, Could you smoking in smoking sone, please. This area is non smoking.*

Posttest response: *Excuse me, sir/mam Can you smoking at the area for smoking. There is the area for smoking. Thank you so much sir/mam. I am really sorry sir/mam.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.66	4.00	3.66	3.33	15.65
Posttest	5.00	5.00	4.67	4.33	19.00

Politeness and appropriacy is the criterion that can be used to assess participants' knowledge of applying the language in context. Their responses reflect their social skills and their language ability to give the most appropriate correspondences to a particular situation. Language proficiency of politeness can be seen from language features that they used such as *'I'm really sorry about that'*, *'I'm terribly sorry sir'*, and *'Thank you so much sir/mam'*. Moreover, adding comments like *'I know situation this is a accident'* make the statements more pleasant. In the fourth sample participant number 24 used the word *'smell bad'* in the pretest which could be considered as not polite so the pretest score was very low. In the posttest, the participant did not use it therefore the score was higher.

3) Word Choice

Word choice was applied to assess vocabulary knowledge related to the restaurant business. Its median difference was only 0.33 which indicates that the vocabulary knowledge was not much different. Approximately half the participants (53.85%) scored higher and 41.03% of the participants scored lower. The average higher score was 4.52 and the average lower score was -2.85. The top five highest different scores were 14.66, 9.66, 9.33, 7.67, and 7.67 respectively. Here are some samples of pretest and posttest responses for this criterion.

- **Participant number 8**

Situation 7: You are a manager of a café who is looking for a part-time

waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: *Hello. Why are you interested in this position?*

Posttest response: *Ok, We'd like to invite you for an interview. this is the **job description.***

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.33	3.33	3.67	14.00
Posttest	4.67	3.33	3.67	4.00	15.67

- **Participant number 14**

Situation 7: You are a manager of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: *Yes, Can you the interview today?*

Posttest response: *Yes, of course. My shop want to **part-time waitress.** Are you ready to interview today?*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.67	2.67	3.00	13.34
Posttest	4.67	4.33	4.33	4.00	17.33

- **Participant number 25**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: *Thank you so much. You're welcome because customer is God.*

Posttest response: *Thank you so much. **I would made food from my heart.***

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.66	2.33	2.00	2.33	10.32
Posttest	4.67	4.00	4.00	3.67	16.33

- **Participant number31**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you very must sir/madam. We look forward to come here again.

Posttest response: Thank you for your **compliments** and I happy which you like it.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.66	2.33	2.66	10.65
Posttest	5.00	4.33	4.00	3.33	16.67

- **Participant number 32**

Situation 3: You are a customer in a restaurant and you order a drink with a waitress. When she brings you the drink, she spills it all over your new dress.

Waitress: Oh, I'm really sorry about that!

Pretest: It's okay

Posttest: It is okay, **never mind.**

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.67	3.67	3.67	15.01
Posttest	5.00	5.00	5.00	5.00	20.00

Word choice was an interesting part to analyze as it can be seen how participants could apply their English vocabulary skills to convey their meanings for responding to the situations given. From the five samples of four situations above, it can be noticed the vocabulary skills of these participants in the posttest was more effective than in the pretest. The first sample is from participant number 8; she changed from asking a question to be affirmative sentence. Also, the posttest response was longer and she could apply the word 'job

description'appropriately. The second sample is from participant number 14; her posttest response was longer with more details. Even though the word '*part-time waitress*'could be seen from the instruction; she could use it properly. The third sample was from participant number 25. She wanted to express her feelings as a professional chef so she used '*I would made from my heart*' which made her posttest response sound more sincere than '*You're welcome because customer is God*' that was used in her pretest. Then, the next sample was from participant number 31 the word '*compliments*' was applied in the posttest which made her score in this criteria higher because the word yielded a more exact meaning. Then, the last sample is from participant number 32 in situation 3.As can be seen she added the word '*never mind*' in her posttest response which was a little bit different but it was really effective, she got five in all criteria.

4) Grammatical Form

Grammatical form did not conform to the trend as other aspects did.

It was the lowest achievement as the median difference was -0.37 . The results of table 4.12 also show that only 48.72% of participants could make progress in this area while 51.28% of participants scored lower in the posttest. The difference of scores between the pretest and posttest were quite varied as the average higher score was 9.12 and the average lower score was -7.98 . The top five highest different scores for this criterion were 30.84, 23.33, 20.83, 18.33, and 15.00. These numbers

are interesting to examine further how different uses of English resulted in different score achievement. Therefore, there are ten samples to illustrate the differences which are separated into two groups; one for five responses with a higher score and one for five responses with lower score.

A) Five samples with higher score achievement

- **Participant number 11**

Situation 7: You are a manager of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: OK. Please enter your application

Posttest response: OK. We'd like to invite you coming here to have an interview.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	3.33	2.67	2.67	11.67
Posttest	5.00	4.67	4.33	4.00	18.00

- **Participant number 20**

Situation 7: You are a manager of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Yes, tomorrow you applying for a job and wait interview.

Posttest response: Tomorrow, You come for a job interview at a café.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.67	2.33	2.00	10.00
Posttest	4.67	3.67	3.67	3.00	15.01

- **Participant number 28**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that

today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: No, Thank you.

Posttest response: I am really sorry. I don't need that. Thank you so much.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.00	2.00	2.33	9.33
Posttest	3.67	3.67	3.67	4.00	15.01

- **Participant number 33**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner. Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you Madam. We look forward you come to enjoy to eat again.

Posttest response: Thank you very much. I'm so happy which you like it.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.33	2.66	13.32
Posttest	5.00	4.67	4.33	4.00	18.00

- **Participant number 35**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner. Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you so much. Have a join your meal.

Posttest response: Oh, really! Thank you so much. Hope you enjoy a meal.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	2.66	2.00	11.99
Posttest	5.00	5.00	5.00	5.00	20.00

The first sample was from participant number 11 in situation 7; the participant's posttest response was longer with more complete information than the pretest. Therefore, all aspects received a higher score. The second sample was from

participant number 20 with the same situation as the first sample. His pretest response was not correct in grammatical form but in his posttest it was better. Then, the third sample was from participant number 28 and her pretest response was really short. It could be interpreted as impolite so the pretest score was quite low. In her posttest response she replied longer which make her expression nicer and her grammatical form was correct so the score was higher. This sample was interesting because the longer sentence improved the etiquette which affects the score in all aspects. The last two samples were from participant number 33 and 35 in a role of a chef who has received a compliment from a customer. The situation required them to show gratitude with manners and the participants could express it through their posttest responses appropriately so the scores were higher.

B) Five samples with lower score achievement

- **Participant number 8**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: *Yes sir. I will change for you.*

Posttest response: *I'm sorry and I'm not let it happen again.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	5.00	5.00	5.00	19.67
Posttest	3.67	3.67	3.00	3.00	13.34

- **Participant number 9**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: *Yes, I will change it for you.*

Posttest response: *OK sir, I will tell the chef and change a new soup for you.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.67	5.00	5.00	19.34
Posttest	5.00	4.00	3.67	3.67	16.34

- **Participant number 10**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner. Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: *Thank you for your compliment.*

Posttest response: *Thany you very much for the praise. We will develop more.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.33	4.33	4.00	17.33
Posttest	4.33	3.67	3.33	3.67	15.00

- **Participant number 38**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner. Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: *Thank you for your compliments.*

Posttest response: *Thank you so much. I truly appreciate your words.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	4.67	4.67	5.00	19.33
Posttest	5.00	4.33	4.33	4.67	18.33

- **Participant number 39**

Situation 1: You are a customer who is sitting in a pizza shop. After you finish having your meal and you want the waiter to bring you the bill.

Pretest response: Bill please.

Posttest response: Check bill, please. I want to pay by credit card.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	5.00	5.00	5.00	20.00
Posttest	3.67	3.67	3.00	3.67	14.01

As the results of table 4.15 indicate there were some participants (33.33%) in the experimental group who gave longer responses in their posttest but received a lower score than in their pretest. From the qualitative analysis it was found that there were many participants who attempted to add more sentences or write longer answer to respond to the given situation but still received lower score. It happened when these participants wanted to elaborate more to convey meanings and their sentence structure was incorrect. These five samples demonstrate this point quite clear as all of them wanted to explain more of the situation but their scores on grammatical form were lower because of grammatical mistakes.

4.3.3 Differences of Language Proficiency Regarding Four Language

Criteria of the Control Group

This part describes about difference of language proficiency in the DCT assessments according to four language criteria of the control group following the results in the table below.

Table 4.15 Comparison of Pretest and Posttest Scores of the Control Group

Control Group	Score Higher		Score Lower		No Difference		Total (n = 23)
	(%)	Average Difference Score	(%)	Average Difference Score	(%)	Average Difference Score	
Task Fulfillment	47.83% (11)	2.12	47.83% (11)	-2.36	4.35% (1)	0	100%
Politeness and Appropriacy	60.87% (14)	1.62	30.43% (7)	-2.29	8.70% (2)	0	100%
Word Choice	65.22% (15)	2.44	34.78% (8)	-2.67	0% (0)	0	100%
Grammatical Form	60.87% (14)	2.69	39.13% (9)	-1.78	0% (0)	0	100%

1) Task Fulfillment

According to the table 4.2, participants' responses were not different overall in terms of task fulfillment as the median difference was 0. However, the results of the table above reveal that nearly half the participants (47.83%) of the control group could score higher in the posttest in this area at the average difference score of 2.12. While similar number of participants (47.83%) scored lower at an average of -2.36. There was only one participant (4.35%) who scored the same. The top five highest score differences were 5, 4, 3.67, 2, and 2. Some samples of responses in this area are presented below.

• Participant number 7

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: *Excuse me. The fork is not clean you change for my please.*

Posttest response: *We are so sorry. I'll change a new one for you.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0	0	0	0	0
Posttest	4.00	3.67	3.33	3.33	14.33

- **Participant number 8**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you. I'll tell the chef.

Posttest response: Thank you very much. I'll try to do my best for the customer.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	1.67	1.67	1.67	1.67	6.68
Posttest	3.67	3.33	3.33	3.33	13.67

- **Participant number 13**

Situation 2: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Ah, I am afraid that we are full of a staff now.

Posttest response: Yes we're have free position you can walk in and make you apply then interview. After that we will tell you a past or not.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0.67	0.67	0.67	1.00	3.01
Posttest	3.00	2.67	2.00	1.67	9.33

- **Participant number 16**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: I'm sorry. I will check a menu please.

Posttest response: Oh, I'm sorry and I will change soup for you, we can give the soup free for you and we apologize.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	1.00	1.33	1.00	1.33	4.67
Posttest	5.00	4.33	4.67	4.33	18.33

- **Participant number 23**

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: Can you change its for me please.

Posttest response: I'll change it to you.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	0.33	0.33	0.33	0.33	1.33
Posttest	3.67	2.67	3.00	3.33	12.67

Overall, the median score of pretest and posttest identify that language skill of the control group in this area was different. This could be interpreted that their language skill in the aspect of task fulfillment tended to be the same. However, these samples above demonstrate that some participants in the control group developed their language skill better in terms of meaning interpretation.

2) Politeness and Appropriacy

The posttest score in this criterion was lower than the pretest as the results from table 4.6 identifies that its median difference was -0.33. The data obviously shows that language skills in politeness and appropriacy were not developed overall for this group which is contrary to the experimental group as it had the highest. However, the results from the table 4.15 reveal that over half of the participants (60.87%) could score higher as the average difference score was 1.62.

There were some participants (30.43%) who scored lower (-2.29) and there were a few participants (8.70%) that scored the same. This phenomenon happened similarly to the experimental group in the aspect of grammar scores. Therefore, there are two groups of samples presented for this area. The first group is for five samples from the group of participants who received the higher score. Another five samples are from participants who received lower scores and are also presented. The top five highest score differences were 4.67, 3.67, 3.33, 1.67, and 1.67. Below are some samples of responses from this item.

A) Five samples with higher score achievement

- **Participant number 7**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: Certainly, sir/madam.

Posttest response: I'm sorry madam, and I will change it just a moment please.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.67	3.67	14.67
Posttest	5.00	5.00	4.67	4.67	19.33

- **Participant number 10**

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: I'll change it.

Posttest response: Sorry sir/madam. I'll change the new fork.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	2.33	2.33	3.00	11.33
Posttest	4.67	4.67	4.33	4.33	18.00

- **Participant number 13**

Situation 6: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Waitress: Oh, I'm really sorry about that!

Pretest response: *It's alright just give me a tissue please.*

Posttest response: *It's alright, can I have tissue please?*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.00	3.67	3.65	15.67
Posttest	5.00	5.00	4.67	4.33	19.00

- **Participant number 23**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell them.

Pretest response: *Excuse me! Don't smoke here, you should smoking in smoking area.*

Posttest response: *Excuse me Sir. The hotel are not allow to smoke. Could you go out to smoke zone please.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	2.67	2.67	2.67	12.01
Posttest	4.67	4.33	4.00	3.67	16.67

- **Participant number 15**

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: *Sorry sir.*

Posttest0 response: *I'm very sorry. We will change the new fork.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.33	2.33	2.33	3.00	9.99
Posttest	5.00	5.00	4.67	4.67	19.34

Even though the median difference of this language criterion of the control group was the lowest; these five samples show that there were some participants who could better develop their language skills of politeness. The first sample was from participant number 7 from situation 5; the participant added *'just a moment please'* to the posttest and scored higher. Similarly, the second sample from participant number 10 added *'Sorry sir/madam'* which sounds more polite than the pretest response. The third sample was from participant number 13 and the posttest answer was changed from an affirmative sentence to interrogative sentence which sounds better. The next sample was from participant number 23, she wrote a longer answer. The participant added *'sir'* which made the sentence more polite. In the second sentence she changed her response from direct speech to be indirect speech which was nicer. Finally, the last sample was from participant number 15, in her posttest response she used a full sentence to reply and add more details to her answer so it was more polite.

B) Five samples with lower score achievement

- **Participant number 4**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest response: *It's alright, can I have tissue please?*

Posttest response: *It's alright just give me a tissue please.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	5.00	4.67	4.33	19.00
Posttest	4.33	4.00	3.67	3.65	15.67

- **Participant number 7**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell them.

Pretest response: *Sorry sir. This area is non smoking zone but you can smoke it outside.*

Posttest response: *Excuse me. at here is prohibit smoking.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.67	4.33	4.33	18.00
Posttest	3.33	2.67	2.67	2.00	10.67

- **Participant number 12**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: *I'm sorry. I will change now.*

Posttest response: *I'm sorry about that. I will change a new.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	5.00	5.00	4.67	19.67
Posttest	4.67	4.33	4.33	3.67	17.00

- **Participant number 16**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which s against the restaurant's rules. You need to tell him.

Pretest response: *Excuse me. no smoking here.*

Posttest response: *Sorry sir, this here don't smoking. You can smoking at the toilet.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.00	3.00	3.33	13.67
Posttest	3.67	2.67	2.67	2.67	11.67

- **Participant number 19**

Situation 8: You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell them.

Pretest response: *Please don't smoking in the hotel.*

Posttest response: *Sorry Sir you can't smoking.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.00	3.00	3.00	12.67
Posttest	2.67	2.33	2.00	2.00	9.00

These samples clearly show that most posttest responses that received lower scores used direct speech which sounds impolite. Although some participants gave suggestions to the situation it did not help. It could be noticed that all of these responses have grammatical mistake and the scores were lower in every aspect. That means grammatical mistakes yielded unsatisfied results within other language aspects as well.

3) Word Choice

Word choice was the second highest difference of the control group as the table 4.2 shows that its median difference was 0.33. Most participants (65.22%) scored better as the average difference was 2.44. Some participants (34.78%) scored lower at – 2.67. The top five highest score differences were 7, 5, 5,

3.67, and 3.33. Some samples of participants' responses are presented below.

- **Participant number 2**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest response: Don't worry.

Posttest response: It's ok. never minds.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.33	3.33	3.33	3.33	13.33
Posttest	4.67	4.67	4.67	4.67	18.00

- **Participant number 4**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: Thank you but I'm on diet.

Posttest response: Thank you, It's very nice but I don't like it.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.33	3.33	3.67	14.67
Posttest	5.00	4.33	4.67	4.67	18.67

- **Participant number 12**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest response: Don't crazy. I'm ok.

Posttest response: That's alright.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.33	2.33	2.33	10.00
Posttest	4.67	4.33	4.33	4.00	17.30

- **Participant number 13**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: My pleasure madam.

Posttest response: Thank you madam, my pleasure.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	3.67	3.67	4.33	15.33
Posttest	5.00	4.67	4.67	4.67	19.00

- **Participant number 16**

Situation 4: You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

Pretest response: I'm sorry. I clean on the fork now.

Posttest response: Oh, I'm sorry and I will change it now.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.00	2.33	2.33	2.67	10.33
Posttest	5.00	5.00	5.00	5.00	20.00

It could be noticed that there were several language strategies used from these five samples. These strategies were all effective as those three experts gave higher scores not only in the aspect of word choice but other areas as well. The third sample of participant number 12 is interesting as her pretest response used the word 'crazy' which might be misunderstood so her score in word choice was really low. In her posttest response she changed her answer to be 'That's alright.' which scored higher.

4) Grammatical Form

This criterion had the highest differences for the control group as its median difference was 1.33. The majority of participants (60.87%) scored higher at an average difference of 2.69. There were only 39.13% of participants who scored lower as the average difference was -1.78. The top five highest score differences were 6.67, 4.67, 4.67, 4.33, and 3.67. Some samples of participants' responses of this language criterion are presented below.

- **Participant number 3**

Situation 1: You are a customer who is sitting in a pizza shop. After you finish having your meal and you want the waiter to bring you the bill.

Pretest response: Check bill please.

Posttest response: Could you bring me a bill, please?

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.00	4.00	4.00	16.33
Posttest	5.00	5.00	4.33	5.00	19.33

- **Participant number 4**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you, you're very pleasure.

Posttest response: Thank you so much madam. I'm happy to hear that.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	3.67	3.33	2.67	14.00
Posttest	4.67	4.67	4.33	4.33	18.00

- **Participant number 8**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Waitress: Oh, I'm really sorry about that!

Pretest response: *It's alright just give me a tissue please.*

Posttest response: *It's alright, can I have tissue please?*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.00	3.67	3.65	15.67
Posttest	5.00	5.00	4.67	4.33	19.00

- **Participant number 10**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: *Thank you so much.*

Posttest response: *Thank you for your compliments. Please come back again.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.00	4.00	4.33	17.00
Posttest	5.00	4.67	4.67	5.00	19.33

- **Participant number 12**

Situation 1: You are a customer who is sitting in a pizza shop. After you finish having your meal and you want the waiter to bring you the bill.

Pretest response: *Excuse me, I would like to the bill, pleas.*

Posttest response: *Could I have the bill please.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	3.67	4.00	2.33	2.67	12.67
Posttest	4.33	4.67	4.00	4.67	17.67

All these samples support the reason why grammatical scores of the control group received the highest median difference. It shows that their grammar skills improved. Although their answers were quite short compared with posttest responses of the experimental group they received higher scores.

4.3.4 Discussion of the Qualitative Results on Language Differences

MacroSIM is successful in favoring language learners to acquire English comprehensively as the evidences of quantitative and qualitative results show. The statistic results reveal that overall both groups of participants developed their English better according to the pretest and posttest scores. Noticeably, the pretest and posttest responses between these two groups were different in terms of sentence lengths. The mean difference of sentence length of the experimental group were much longer (11.31) than the control group (-0.43). When compared statistically between four language criteria it was found that there was one language area, task fulfillment, of the experimental group that is significant different after the implementation. However, knowledge of English grammar of the experimental group was not improved as its trend decreased obviously. This part is dedicated to having more discussions about these topics with qualitative findings to understand their language differences.

The qualitative results identified that participants from both groups used English in their posttest responses dissimilarly from their pretest responses in

many ways. According to the four language criteria, both were totally different. The experimental group had the highest median difference in politeness and appropriacy while this area was the lowest median difference in the control group. In contrary, the highest median difference of the control group was in the grammar area which was the lowest median difference in the experimental group. In aspects of sentence length the evidence demonstrates that the experimental group tried to create longer sentences to convey more meanings but failed to achieve the correct forms of grammar. Moreover, it was found that there were some emerging language patterns that these participants used in their posttest responses. They were more polite, adding more explanations or details, giving suggestion, using alternative sentences or phrases, using spoken language features, using alternative vocabularies, and applying new vocabularies. The results reveal that the experimental group (5.31%) had a higher frequency in changing the use of English than the control group (3.30%). It could be noticed that their English reach far beyond those four language criteria. According to the qualitative results, it could be concluded that MacroSIM program affected the use of English of the experimental group in three topics as 1) Increasing ability of language comprehension 2) Improving language skill for service business and 3) Encouraging confidence to use English.

1) Increasing Ability Language Comprehension

The results of Wilcoxon signed-rank test indicated that task

fulfillment was significantly different in English use on pretest and posttest assessment of the experimental group. Its median difference in the posttest was 34.00 which was higher by 1.00 from the pretest (33.00). The table 4.7 reveals that in the posttest there were more participants who achieved excellent and very proficient levels. Moreover, there were only 2.56% of participants who were of a weak level in the posttest. When looking in detail for all 8-items of DCT assessment, it shows that the number of frequency in which the experimental group failed to complete the tasks in the pretest was 27 times. After 10 weeks of the implementation; there were only 7 found in the posttest. It could be inferred that participants of the experimental group were more comprehend the language better after learning English through MacroSIM for 10 weeks.

The results of qualitative analysis also reveal that the experimental group used a lot of language strategies to convey more meanings to respond to the situation. The analysis found two groups of emerging patterns for language use; they were adding more meaning and more choice of vocabulary. The most significant difference in terms of qualitative results is about adding more meaning and the results identify that the experimental group (5.17%) had changed their posttest responses more frequently than the control group (2.92%). The second difference is about vocabulary knowledge which was found that the experimental group (0.39%) changed their posttest responses related to this item

more often than the control group (0.17%). Moreover, the posttest responses of the experimental group were much longer than the control group and there were some interesting points to illustrate their different use of English in the sense of using the language in context.

The qualitative analysis also found that some participants used their imagination to create contexts for given situations as shown below.

- **Participant number 12**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest response: No problem.

Posttest response: No problem. But I want to change the new dress because I have a meeting. Can you help me?

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.00	4.00	4.00	16.33
Posttest	4.33	3.67	3.67	3.67	15.34

- **Participant number 16**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest response: Don't worry, and Where I can change my dress.

Posttest response: Oh god, that' ok. And I would like you to find some new dress that I can change now. And of cause, please bring me to the bathroom.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.33	4.33	3.67	16.66
Posttest	3.67	3.67	3.67	3.67	14.67

- **Participant number 38**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest response: Ah, no worried about that. I'm not mind, but next time walk carefully.

Posttest response: Oh my goodness. Luckily, I'm done my work. No worried about this, I'm fine.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.00	3.00	2.67	14.00
Posttest	5.00	5.00	5.00	4.33	19.33

These participants wrote longer sentences with specific details which could be interpreted that they imagined the situation and created the sentences according to their imaginative characters in that scenario. This is different from the control group as there was no evidence found from their posttest responses.

2) Improving Language Skill for Service Industry

In the sense of using English in the service industry, the most distinctive language patterns emerged from the qualitative analysis was of politeness. Participants in the experimental group had changed their use of English to respond in posttest assessments remarkably. The different median scores also reveal that politeness and appropriacy (1.34) had the highest difference among other language criteria. They obviously used several language features which emerged as a language pattern from all posttest responses. In general, they tried to

be polite by using apology phrases such as *'I'm terribly sorry sir'*, *'I'm sorry to tell you that'*, *'sorry to interrupt you sir'*, and *'I'm really sorry about that'*. They also added more language strategy features to their posttest responses for example *'I'll fix it immediately and not let it happen again'*, *'just a moment, please'*, *'Have a nice day'*, *'It's nice to hear that'* and *'Please, wait a second'* which were effective.

Moreover, they tried to explain about situations by giving more information and details. In a difficult situation like informing a guest about the prohibited area for smoking, some of them gave suggestion to a smoking zone which could make the situation better. The qualitative findings also found that some participants in the experimental group wrote posttest responses very much longer than the pretest responses. Even though they wrote longer sentences but the scores were not higher; in some cases the scores were lower as samples below.

- **Participant number 3**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: *Thank you very much for your compliments.*

Posttest response: *Oh really? Thank you very much. You can come back to eating in our restaurant again.*

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	5.00	4.67	4.67	4.00	18.33
Posttest	4.67	4.33	4.00	4.33	17.33

- **Participant number 9**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you very much, your welcome.

Posttest response: Oh, thank you very so much. It's nice to hear that. I hope you come again. Your welcome.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.33	3.67	3.67	16.33
Posttest	5.00	4.67	4.33	4.33	18.33

- **Participant number 16**

Situation 6: You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

Pretest response: Thank you for your compliment.

Posttest response: I'm really thank you for this compliment. And I'll try my best to make food as delicious as I can. Actually, please coming again I will cook the best one for you.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.67	4.33	4.33	4.67	18.00
Posttest	5.00	4.33	4.33	4.33	18.00

These are some samples to show that their posttest responses convey more meanings and they could apply politeness features properly. Also, it could be seen that their English was better but the scores were not of much different.

3) Encouraging Confidence to Use English

The evidence of giving longer posttest responses shows that

participants of the experimental group felt more confident to use English. This could be inferred that for all 10 weeks that they had to rely on themselves to study about English in the restaurant industry increased their confidence of using the language. Even though some of their posttest answers were not correct in terms of grammatical form these participants were stimulated to think in English and felt more positive of their ability to use English as shown below.

- **Participant number 15**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: Wait a moment, please. I will ask the chef and manager.

Posttest response: Yes, ma'am. It's a general soup form our restaurant. But the chef can cook this soup for better if you like a new tase cook for not salty. We can't change. I'm so sorry.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.67	3.33	3.67	14.67
Posttest	4.67	4.33	3.67	3.00	15.67

- **Participant number 16**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: Certainly, sir/madam. I'm going to bring our chef to talk with you. And you can change, sir/madam.

Posttest response: Excuse me, madam. What's happen. I think it has something wrong. And I'm going to change a new one for you. And I will call the chef. Please wait a moment, madam.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	2.67	2.67	2.33	3.33	11.00
Posttest	4.00	4.00	3.67	4.33	16.00

- **Participant number 38**

Situation 5: You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty? Is it possible to change it?

Pretest response: Certainly, just a moment, please.

Posttest response: Really, sir/mam. I have to sorry for that. I'll ask chef for the new one. Just a minute, sir/mam.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	4.00	4.00	4.33	16.33
Posttest	5.00	4.33	4.00	4.33	17.66

As can be seen, their posttest responses were initiative and they all were different which mean that they were not from script. It shows that these participants created their answers base on their English knowledge for their own meanings. Furthermore, there were some evidences about the use of spoken language features at the beginning of their responses are also interesting as samples below.

- **Participant number 18**

Situation 7: You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl who calls to apply for the position.

The girl: Hello. I'm interested to apply for the position of part-time waitress.

Pretest response: Let talk in counter please.

Posttest response: Oh! That good. Welcome. Please come here.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	1.67	1.33	1.33	1.33	5.67
Posttest	3.67	3.00	2.67	2.67	12.01

- **Participant number 25**

Situation 3: You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Pretest response: Oh Hmm don't be worried about it.

Posttest response: Oh my dress. So where are toilet / ok is ok don't be worried.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.33	4.00	3.00	2.67	14.00
Posttest	5.00	5.00	5.00	4.33	19.33

- **Participant number 33**

Situation 2: You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

Pretest response: Sorry, I'd like salad

Posttest response: Oh sound good! but today I would like to eat Som-tum.

Score	Task Fulfillment	Politeness and Appropriacy	Word Choice	Grammatical Form	Total
Pretest	4.00	3.33	3.33	4.00	14.66
Posttest	5.00	4.67	5.00	4.00	18.67

The number of spoken language features used in the posttest responses was higher as they were found 38 times from 27 participants; whereas the pretest responses they were found only 27 times from 15 participants. Comparing with the posttest responses of the control group these spoken language features were found only 8 times from 3 participants. This number was not much different from their pretest responses as these features were found 4 times from 3 participants. Moreover, there were more various styles of these features used in the experimental group's posttest responses such as *'Ah'*, *'Umm..'*, *'Oh god'*, *'Oh really!'*, *'Oh sound good!'*, and *'Oh my goodness'*. It was different from their pretest responses as most of the time they used only *'Oh'* in their answers. It could be interpreted that they perceived the use of these features from other online friends in MacroSIM and they applied them in their responses naturally. The next part presents the results of learners' perceptions toward their experience of English learning through MacroSIM program.

4.4 Learners' Perceptions of MacroSIM

This part demonstrates perceptions of 39 participants in the experimental group who had learned English autonomously through MacroSIM for ten weeks. According to the second research question: What are the participants' perceptions of the learning process when learning English through MacroSIM? The first part

presents the findings from evaluation questionnaires and the second part is the findings from participants' diaries.

4.4.1 Quantitative Results from the Evaluation Questionnaire

At the end of the course, learners were asked to respond to an Evaluation Questionnaire. It has 14 questions; item 1 – 11 are 5-point Likert Scale ranging from 'Not at all' to 'Very much'. Item 12 - 13 are graded from 'Very easy' to 'Very difficult' and the last item is open-ended question. All responses were analyzed by statistical methods. The data was divided into two parts; advantages and limitations. Questions number 1, 2, 3, 4, 5, 6, 10, and 11 were grouped as advantages and questions number 7, 8, 9, 12, 13, and 14 were in the group of program limitations. Question number 14 asked the participants to give reasons about any uncomfortable experience using MacroSIM.

All participants administered the questionnaire by ranking their perceptions of MacroSIM towards each statement given. The data was analyzed to calculate the mean score of each question and interpreted using criteria for rating scale interpretations as below.

4.50 – 5.00	means	Participants valued their perception toward the statement as a 'very high' level.
3.50 – 4.49	means	Participants valued their perception toward the statement as a 'high' level.
2.50 – 3.49	means	Participants valued their perception toward the statement as a 'moderate' level.
1.50 – 2.49	means	Participants valued their perception toward the statement as a 'low' level.
1.00 – 1.49	means	Participants valued their perception toward the statement as a 'very low' level.

Overall, participants evaluated their learning process through MacroSIM as a higher level (mean = 3.92). The highest mean score is for item number five which states they experienced freedom during their learning English with MacroSIM tasks. They also enjoyed their learning experience with MacroSIM tasks at a high level (mean = 4.15). They thought that MacroSIM tasks fostered them to be exposed to an English environment at a high level as the mean score was 4.12. They claimed that their English skills were developed and they were successful in MacroSIM tasks as these items received mean scores of 4.02 and 3.78 respectively. They were able to control their own learning process at a high level as this item received a mean score of 3.73. Furthermore, they thought that MacroSIM was helpful for learning English at a high level (mean = 3.71). When asking about their preference to replace the traditional style of English learning with MacroSIM, the mean score is at 3.29.

Table 4.16 Advantages of Learning English through MacroSIM

No.	Statement	Mean	S.D.	Level of Perception
Q5	Did you experience freedom during your learning English with MacroSIM tasks?	4.59	0.67	Very high
Q1	How much did you enjoy your experience with MacroSIM tasks?	4.15	0.82	High
Q2	How much are you exposed to English in the environment of MacroSIM tasks?	4.12	0.75	High
Q6	How much has your English developed as a consequence of performing the MacroSIM tasks?	4.02	0.65	High
Q3	How successful were you in MacroSIM tasks?	3.78	0.79	High

Table 4.16 (continued)

No.	Statement	Mean	S.D.	Level of Perception
Q4	To what extent were you able to control your learning process?	3.73	0.63	High
Q11	Do you think that MacroSIM will be helpful for your English learning?	3.71	0.84	High
Q10	Do you prefer MacroSIM tasks to a traditional approach for English learning?	3.29	0.98	Moderate
	Total	3.92	0.12	High

The table below presents learners' perceptions towards the limitations of learning English through MacroSIM. Learners perceived that MacroSIM had an overall limitation at a moderate level with a mean score of 2.68. The highest level belongs to question number 8 which they had some confusion over while learning English with MacroSIM tasks at 2.88. The second highest was about how uncomfortable they were while learning English with MacroSIM at 2.61. Lastly, they felt uncomfortable with the facility of the computer lab at 2.37.

Table 4.17 Limitations of Learning English through MacroSIM

No.	Statement	Mean	S.D.	Level of Perception
Q8	Did you feel confused during your learning English with MacroSIM tasks?	2.88	1.00	Moderate
Q7	Did you feel uncomfortable during your learning English with MacroSIM tasks?	2.61	1.05	Moderate
Q9	Did you feel uncomfortable with the facilities in the computer lab?	2.37	1.07	Moderate
	Total	2.62	0.15	Moderate

Question item 12 and 13 were formulated to measure any difficulty of learning English through MacroSIM in IMVU virtual world. The data was analyzed to find the mean scores of each statement and were interpreted using criteria for rating scale interpretation as follow.

4.50 - 5.00	means	Participants valued their perception toward the statement as a 'very difficult' level.
3.50 - 4.49	means	Participants valued their perception toward the statement as a 'difficult' level.
2.50 - 3.49	means	Participants valued their perception toward the statement as a 'moderate' level.
1.50 - 2.49	means	Participants valued their perception toward the statement as a 'easy' level.
1.00 - 1.49	means	Participants valued their perception toward the statement as a 'very easy' level.

Table 4.18 Difficulty of Learning English through MacroSIM

No.	Statement	Mean	S.D.	Level of Perception
Q12	Did you find the assigned roles difficult?	2.80	1.08	Moderate
Q13	Did you find IMVU virtual world difficult to use?	2.76	1.07	Moderate
	Total	2.78	0.01	Moderate

The findings show that all participants felt a moderate level of difficulty in this approach. They perceived that the assigned roles of these 4 positions; customer, waiter/waitress, chef, and manager, were quite difficult as the mean score is at 2.80. They found that IMVU virtual world is moderately difficult to use at 2.76. Some participants wrote their comments about their experience learning English through MacroSIM; some samples of comments are presented in the following part.

4.4.2 Participants' Comments towards MacroSIM

Question number 14 asked 'Did you feel uncomfortable during your English learning experience with MacroSIM? Please, indicate the reason'. All of the participants wrote their comments at the bottom of the questionnaire. Some of them thought that MacroSIM was helpful and convenient to use (19 participants) but some said that there were sometimes internet problems (20 participants). Below are some samples of their comments with reasons.

Comfortable

1. *It was very comfortable when using MacroSIM. I had the freedom to learn and I could organize my own learning. (Participant number 8)*
2. *It was fun and relaxed in class. It was like using English in daily life.(Participant number 13)*
3. *This kind of learning approach makes me feel more active. The way that I have to find information by myself makes me remember more and I can use it in my daily life.(Participant number 14)*
4. *I was satisfied with this program, it's easy and convenient. It was like I was in a role of another person.(Participant number 22)*
5. *I didn't have any uncomfortable feelings toward this program. It was fun to learn English through this. I got lots of knowledge and met a lot of foreign friends that I can now exchange information with each other.(Participant number 28)*

Uncomfortable

1. *I had some uncomfortable feelings but not much. It's about the internet connection and sometimes I couldn't login to the website.(Participant number 9)*

2. *I thought that the computers were not enough for the number of students and the internet was not fast enough. For me, I prefer to study with content and practice in the actual setting like I am in a real restaurant. (Participant number 15)*
3. *Sometimes, the internet connection was weak. For me, I'd like to have this course in the real situation. I want to have the feeling of working in a real restaurant. Thank you.(Participant number 17)*
4. *I felt uncomfortable sometimes with the slow internet connection.(Participant number 23)*
5. *Besides the internet connection, nothing was uncomfortable. Everything was fine.(Participant number 34)*

4.4.3 Qualitative Results from Diary about MacroSIM

A diary is a very important research instrument for this study; its objective was to collect information that related to the process of the language learning of each student. Therefore, they were allowed to write in Thai. Each participant of the experimental group was given one diary with a pen on the first day of the opening course and they were told to write anything they wanted to express their ideas about learning English through MacroSIM. The diaries were given back to the teacher on the last day of the course and the results are presented below.

Table 4.19 Overall Findings of All Diaries

Diary	Total	Average
• Total word count	15,689	4,908.07
• Total entry	138	3.54
• Word count per each entry	15,689	113.69

All participants were free to share their feelings or gave opinions in the diary; there were not any regulations as to content. Participants wrote their diaries 2 – 6 entries and the total number of words that they had written was 15,689 words. The shortest entry one student wrote was *'I didn't go to class today'*. The longest entry had 669 words which was three pages long. From all 39 diaries, there were totally 138 entries and the average was 3.54 entries. Qualitative analysis of these 39 diaries found 142 comments stating about their perceptions regarding MacroSIM program. This is divided into four parts; feelings about MacroSIM, advantages of MacroSIM, disadvantages of MacroSIM, and expressing gratitude, as details follow.

Table 4.20 Categories of Participants' Comments towards MacroSIM

Findings	Frequency of Comments
A) Feelings about MacroSIM (4 categories) <ol style="list-style-type: none"> 1. Being relaxed and enjoyable 2. Using English more confidently 3. Using English more fluently 4. Being more courageous to speak English with foreigners 	27 10 7 8 2
B) Advantages of MacroSIM (7 categories) <ol style="list-style-type: none"> 1. Practicing about English use in restaurant environment 2. Developing communication skills 3. Speaking with foreigners 4. Knowing about food and cooking 5. Knowing about job application regulations 6. Learning new information and vocabularies 7. Being an assistant to friends 	88 10 24 20 6 14 12 2
C) Disadvantages of MacroSIM (4 categories) <ol style="list-style-type: none"> 1. Inappropriate behavior of online foreigners 2. Foreigners do not understand our learning purpose 3. Problems about computer devices and the internet system 4. Task design 	16 4 5 3 4

Table 4.20 (continued)

Findings	Frequency of Comments
D) Expressing Gratitude (4 categories)	11
1. Thanks for teaching me	3
2. Thanks for introducing this program	5
3. Thanks for taking care of us	1
4. Thanks for giving some advices	2
Total	142 comments

A) Feelings about MacroSIM (4 categories, 27 comments)

The first group of the finding is about participants' feelings towards MacroSIM. It could be divided into 4 categories with 27 comments. Being relaxed and enjoyable (10), using English more confidently (7), using English more fluently (8), and being more courageous to speak English with foreigners (2).

1) Being relaxed and enjoyable (10 comments)

(1) It was really fun; I practiced using English and played games at the same time. This made me feel that it wasn't a class for studying, it was relaxing and I like this course very much. (Participant number 3)

(2) After I took a role as a chef and applied for a job at a restaurant, I found out that I knew many vocabularies and understood more about job application steps. There are specific terms that should be used in this topic. It was fun and I have learned a lot about vocabularies and grammar. (Participant number 5)

(3) It was like I was in my own world; I could do anything I wanted to such as dressing up, decorating my home, shopping, and traveling to places. It was really fun and relaxing. (Participant number 8)

(4) I like this teaching style very much; it made me feel excited all the time. I felt like I was talking with real foreigners not with my friends. (Participant number 33)

2) Using English more confidently (7 comments)

(1) My English skills are better; I can now use alternative words but with the same meanings in my conversation. (Participant number 12)

(2) Even though, my grammar is not exactly correct I can communicate better. I need to study more from YouTube and Google. I think that if I practice more I can go for an internship program in a hotel when I'm in 4th year. MacroSIM helped me practice speaking a lot. (Participant number 23)

(3) I think that I can use English better now; MacroSIM is good for communicating with foreigners around the world. Although, today is the end of the course I'll continue using it. (Participant number 26)

(4) After using MacroSIM for many weeks I feel that my English is much better. (Participant number 28)

(5) Today I can use English more accurately. (Participant number 30)

3) Using English more fluently (8 comments)

(1) After having conversations in MacroSIM, I have learned a lot about vocabularies. I can now ask questions and give answers quicker. (Participant number 2)

(2) When I had more English conversations I felt that I could use it more fluently. (Participant number 16)

(3) I can talk to my friends more fluently. I took a role as a chef, a waitress, and having a job interviewing. I can exchange knowledge with friends which help to increase my language skills. (Participant number 30)

(4) The first time that I was in MacroSIM, someone talked to me

but I didn't know some words so I needed to look them up in the dictionary. It took me so long to understand his message well enough to give a response. Now I use in MacroSIM more often and I can do more. When I received the same questions, I could response faster. (Participant number 33)

4) Being more courageous to speak English with foreigners (2)

(1) Today is the last day for this course. I'm so happy that I took this course; it makes me more courageous to speak with foreigners. I have learned a lot about culture and how to behave in a restaurant environment. (Participant number 18)

(2) Using this program is really good and I can practice a lot in using English. I am more courageous to speak with foreigners. (Participant number 37)

B) Advantages of MacroSIM (7 categories, 88 comments)

There are more interesting findings as this group of participants stated that they 'gained' something after having experienced MacroSIM. There were 88 comments that used the word 'gained' in the meaning that MacroSIM benefited them in several aspects. These comments can be grouped into 7 categories; practicing about language use in a restaurant environment (10), developing communication skills (24), speaking with foreigners (20), knowing about food and cooking (6), knowing about job application regulations (14), learning about new information and vocabularies (12), and being an assistant to their friends (2).

1) Practicing about English use in restaurant (10 comments)

(1) I practiced having conversations in the roles of a customer and a waitress. I have learned how to use English in the restaurant such as how should I say or what should I do. (Participant number 13)

(2) I've learned how to have a conversation in the role of a waiter for example how to serve food in a restaurant or how to serve a drink in a café. Also, I've learned about what questions I should ask if I work as a waiter or what type of sentences are correct to use. If I need to work in this position I now know how to prepare myself and what vocabularies I should use. (Participant number 17)

(3) I've learned about the appropriate manner in restaurants, how should behave and how to order food. (Participant number 18)

2) Developing communication skills (24 comments)

(1) When I use English more often I feel that I am more fluent. I have learned about new phrases from friends when we had conversation for job interviewing. At first, I didn't understand the purpose or why should we learn English through this program but when I'd used it for a few weeks my English was getting better. Before taking this course, I had limited knowledge of idioms and phrases but now I know a lot better. I think I can apply these phrases with my life when I have job interviews in the future. (Participant number 16)

(2) I think when we talk or have an interview in several roles; as a chef or a manager, it helps to improve our communication skill. (Participant number 19)

(3) Learning English through MacroSIM teaches me about having a conversation. It shows how to use words for communicating meanings. If we can use this program more often we will learn a lot and it helps to improve our language skills. Using MacroSIM helps us to be better in English. (Participant number 20)

3) Speaking with foreigners (20 comments)

(1) I have been talking with some foreigners; mostly they like talking about personal information but that's alright. It was good for exchanging ideas. I like traveling so when I talked to them I introduced some tourism attractions. It was like we have exchanged some tourist information with each other. (Participant number 12)

(2) I've learned about a proper type of conversation that I should use with foreigners. I know a lot about what type of sentence should or shouldn't use. I also learned about which sentences are frequently used among foreigners. Some foreigners did not understand what we were doing so it was quite hard to continue the conversation. (Participant number 17)

(3) I have made friend with lots of foreigners from several countries through MacroSIM and I have learned many abbreviations from them. (Participant number 23)

(4) It was much fun using the program, I met some new friends and they taught me other languages like French and Italian. (Participant number 37)

4) Knowing about food and cooking (6 comments)

(1) I gained a lot of knowledge about cooking and how to be a chef. (Participant number 2)

(2) In the role of chef I have learned how to cook and some cooking vocabularies. When I was in the role of a waitress who was interviewed for a job, I learned how to give answers and what type of questions would be asked in a job interview. (Participant number 13)

(3) Today I took the role of a waiter for a job interview; I also took a role as a chef. I found lots of information about cooking from several websites. (Participant number 20)

5) Knowing about job applications (14 comments)

(1) When you told me that I had to apply for a job, I tried to find information about it and I learned a lot. I learned that there were many specific terms for applying for a chef's position. It was so fun and I gained a lot of vocabularies and grammar notions. (Participant number 5)

(2) This week I took a role as a manager and tried to interview

friends; it was really good for practicing, asking and answering questions. In the future, it would be easier for me if I have to answer these questions in case if I will be interviewed for a job overseas. (Participant number 16)

(3) I practiced to make a job ad and interview many applicants who wanted to work in my restaurant. It was good for practicing and asking questions. Moreover, I've learned many new vocabularies for job interviewing. I know a lot of techniques I should use for giving responses properly. (Participant number 17)

6) Learning new information and vocabularies (12 comments)

(1) I've learned many new vocabularies and cooking steps. (Participant number 1)

(2) After having conversations in MacroSIM, I've gotten a lot of vocabularies. I also asked questions and gave answers more fluently. (Participant number 4)

(3) It was so fun and relaxing. I like this course a lot and it helped developing my vocabulary skill. It was like I could practice asking questions and giving answers more. (Participant number 10)

7) Being an assistant to their friends (2 comments)

(1) I could help my friends speak English. (Participant number 13)

(2) I assisted my friends who were not fluent in English to be better. (Participant number 30)

C) Disadvantages of MacroSIM (4 categories, 16 comments)

In addition, there were some participants who evaluated the program with both positive and negative comments. This section presents constructive comments which have 4 categories with 15 comments. They commented about inappropriate behavior of online foreigners (4), foreigners do not understand our learning purpose (5),

problems about computer device and internet system (3), and task design (4).

1) Inappropriate behavior of online foreigners (4 comments)

(1) Some foreigners talked to me in a good manner but someone was impolite. (Participant number 6)

(2) Some foreign friends felt disappointed and left the chat room suddenly. However, someone talked to me nicely and asked for my Facebook or Line account. (Participant number 11)

(3) One foreigner talked to me impolitely so I didn't want to go on talking with him. (Participant number 24)

(4) Today I met a guy who talked to me very rudely; he wanted to call me so he kept asking for my Line account. I ignored him and I left the program immediately. (Participant number 37)

2) Foreigners do not understand our learning purpose (5 comments)

(1) When some foreigners spoke to me, the conversation was different because they always asked about my personal information. There were a few people who understood and simulated their role. (Participant number 12)

(2) Most of the time I had conversation with my classmates because foreigners didn't understand my learning process. Actually, there were some foreigners who came and talked to me but the things we talked about were not related to the course. (Participant number 14)

(3) Foreigners did not cooperate in having conversations with me, there were a few but they still didn't understand so it's hard to keep continuing the dialogue. MacroSIM is good but sometimes it was not private. (Participant number 17)

(4) When I talked to foreign friends they did not cooperate.

However, when I came to talk with my classmates it was better because we understood each other and we knew our purpose for having the conversation. (Participant number 25)

(5) For me I think this program is useful but there were something inappropriate such as I found some children who were under-age. I like this learning approach because it's like I was 'forced' to use English for communication (there were some other languages but most was in English). I needed to adjust myself and practice to use it otherwise I couldn't understand them. (Participant number 16)

3) Problems about computer devices and the internet system (3 comments)

(1) After I used MacroSIM for many weeks I think my English skills developed. Sometimes, I got upset because I couldn't remember my password for the IMVU website. So I had to register again then I was behind my friends. (Participant number 26)

(2) Today was my last day for this course but I couldn't connect to the IMVU website. I spent a long time to fix it and my friends kept asking why I cannot use it. I needed to register for a new account. After I got into the web I rushed to talk to my friends. My project did not progress so much for this period. (Participant number 27)

(3) I got a problem when I've tried to submit my file into the server because it's full. I had to wait for quite some time. The class time almost ended and finally my project was done. (Participant number 34)

4) Task design (4 comments)

(1) This learning method is different from the others which I'm not familiar with. I think if we practice in the real conversation it would be better

because we can apply it with our daily life. (Participant number 15)

(2) However, when I had a conversation with a new friend we still used the same sentences and I felt bored. Perhaps it was because the period of time that I had to make a record for each role was too long. (Participant number 19)

(3) I would give the score 8 out of 10 because I have to use the computer with internet and this distracted me from my learning a lot. (Participant number 22)

(4) My favorite role was being a restaurant manager because I like asking and answering in this position. However, it is a little bit hard as I had to type instead of speaking. (Participant number 25)

D) Expressing Gratitude (4 categories, 11 comments)

There were some participants who wrote about learning English through MacroSIM with interesting views. They all felt thankful although some participants expressed that they did not like learning through MacroSIM. There were 11 comments which can be grouped into 4 categories; thanks for teaching me (3), thanks for introducing this program (5), thanks for taking care of us (1), thanks for giving advice (2). Below are some of their comments about this program, both positive and negative ones.

1) Thanks for teaching me (3 comments)

(1) My feelings about this course are that I don't like it, I may feel different from my friends. I like studying with content and get more practices more. Maybe learning by rote memorization could make me see things clearer. Even though, my comment differs from my friends, I'd like to still say thank you for helping us in studying English. (Participant number 12)

(2) Thank you for teaching me, even though I still haven't

understood everything. You taught me to have courage to use the language. You encouraged me to speak and express my ideas. Now my English is getting better. IMVU is a good website that helps us to communicate with people worldwide. Even though the course is finished, I'll continue using it for practicing my English skill. (Participant number 26)

(3) Today is the last day for this course, I'd like to say thank you for teaching us. Your new teaching approach makes me feel enjoyable and excited every time I come to class. (Participant number 36)

2) Thanks for introducing this program (5 comments)

(1) I was not nervous when communicating with friends in MacroSIM, when I felt relaxed I could think clearer. I'd like to say thank you for opening my eyes to the world and I'll continue using this program for improving my English. (Participant number 16)

(2) I think this program is really useful; playing computer games is not always useless. It helped me learn many new vocabularies. I'll continue using it; I've already downloaded the program into my notebook. This is another way that I can learn English and I can continually practice on my own. Thank you for introducing this program, MacroSIM helps me improving my English a lot. (Participant number 28)

(3) I'd like you to know that I was determined to attend every class although I'm not very good in English, but at least I kept trying. Thank you very much for introducing me this new online media for learning English. (Participant number 34)

3) Thanks for taking care of us (1 comment)

(1) I like your teaching very much, it allows students to gain knowledge outside the classroom and I can share my ideas in different ways. I want

all of the teachers in the university to teach us this way, it helps students learn things without stress. I'd like to say thank you for giving me this knowledge and taking care of us for the whole semester. Lastly, I wish you happiness and good health. Thank you. (Participant number 18)

4) Thanks for giving some advices (2 comments)

(1) Thank you for your advice and assistance in my studying. (Participant number 12)

(2) If asking about how I feel about this course, I would say I don't like it because I like to study with content and get some practice. Self-directed learning or self-responsibility is something everyone should have in general. Studying on my own through online resources is good but most of the time we talked to each other because foreigners did not understand what we were doing. By the way, I'd like to say thank you for your suggestions. I'll try to apply them with my life. PS. I didn't mean to say something bad but everything I said is my real feelings. (Participant number 14)

4.4.4 Discussion of the Findings about MacroSIM

The results from quantitative and qualitative analysis suggest that the experimental group felt positive with the process of learning English through MacroSIM. The results of program evaluation reveal that the highest influence of this program on their perception is about the experience of freedom in learning English (4.59). However, they felt moderate (3.29) when asked about employing MacroSIM tasks to replace traditional English learning approaches. In terms of limitations of the program, they reported that they were sometimes confused during learning English with MacroSIM as it received a mean score of 2.88. The most

uncomfortable feeling was about the facilities of the computer lab (2.37). When asking about the difficulties of using the program, they felt moderate towards its assigned roles at 2.80 and the use of IMVU virtual world was at 2.76. All participants of the experimental group gave comments about the program which could be categorized by two perspectives; comfortable and uncomfortable. They reported that MacroSIM was useful, convenient to use and benefited their English learning. On the other hand, there were some inconveniences about internet connections and insufficiency of computer devices. There were some interesting issues to be discussed from qualitative results as follow.

4.4.4.1 Positive Feelings of Using MacroSIM as a Learning Tool

The largest group of comments towards MacroSIM program was about its advantages which received 88 comments and could be grouped into 7 categories. They reported that MacroSIM benefited them in the aspect of developing communication skills most as there were 24 comments on this topic. Then, there were 20 comments talking about MacroSIM giving them opportunities to have conversations with foreigners. In addition, they had learned about job applying regulations and they thought it was helpful for their future (14 comments). They also stated that they knew more about new information and vocabularies related to the restaurant business (12 comments). Lastly, MacroSIM helped them practicing about English usage in restaurants (10 comments), knowing about food and cooking (6

comments), and being an assistant to their friends (2 comments).

Furthermore, there were 27 comments about their thoughts regarding MacroSIM which could be divided into 4 categories. They said that learning English through MacroSIM was relaxing and enjoyable (10 comments). It helped them use English fluently (8 comments) and accurately (7 comments). There were 2 comments stated that they felt more courageous to speak English with foreigners.

Some participants expressed their gratitude by saying 'thank you' for several reasons. The highest frequency belongs to thanks for introducing this program, as it received 5 comments. Even though there was no instructions in this course there were 3 participants who expressed 'thank you for teaching me'. There were 2 participants giving thanks for advice and 1 participant said 'thank you for taking care of us'.

4.4.4.2 Disadvantages in Using MacroSIM as a Learning Tool

From all 142 comments about the MacroSIM program, there were 16 comments stating about its disadvantages which could be divided into 4 groups. The biggest criticism said that foreigners did not understand their purpose of using this virtual world for English learning (5 comments). There were 4 participants who found that some online foreigners behaved inappropriately. Task design was mentioned 4 times. Finally, there were 3 comments about problems of computer devices and internet systems.

4.5 Investigation of Learning Autonomy

The third research question asks ‘How do these participants perceive the value of learning autonomy?’ this part is dedicated to the results of the autonomy questionnaire.

4.5.1 Quantitative Results from Autonomy Questionnaire

In this study, learning autonomy was assessed by twelve-items. The autonomy questionnaire was adapted from Cooker's full model of learner autonomy (2012). The questionnaire was translated into Thai and distributed for assessing self-perceptions of learner's autonomy of all participants in the experimental group. All participants were asked to give answers to the questionnaire at the beginning and at the end of the course. They had to rate their feeling on each statement according to a 5-point Likert scale ranging from 1 to 5. Each item had 5 points and the total score of the questionnaire was 60. Below are the criteria and meanings of each rating scale with the results.

Number 1 means the participant doesn't have any agreement on that statement at all.

Number 2 means the participant have low level of agreement on that statement.

Number 3 means the participant have moderate level of agreement on that statement.

Number 4 means the participant have high level of agreement on that statement.

Number 5 means the participant have very high level of agreement on that statement.

Table 4.21 Overall Results of Participants' Self-Perception on Learning Autonomy

Learning Autonomy	Total Score (60)			Highest Score		Lowest Score	
	Average	S.D.	(%)	(60)	(%)	(60)	(%)
Before	25.10	6.98	41.83%	45.00	75.00%	15.00	25.00%
After	48.03	5.73	80.05%	58.00	96.67%	36.00	60.00%
Total Difference	22.93		38.22%				

The results of the learning autonomy questionnaire clearly reveal that the participants in the experimental group perceived themselves as having more autonomy while learning English through MacroSIM. Before the implementation, the average level of learning autonomy was 25.10 (41.83%). The highest level was 45.00 (75.00%) and the lowest was 15.00 (25.00%). Apparently, after the implementation of ten weeks these participants perceived themselves having learning autonomy higher at 38.22% as the average level was 48.03 (80.05%). The highest score reached was 58.00 (96.67%) and the lowest was 36.00 (60%). The difference of the average level of learning autonomy was 22.93 which was 38.22% higher. It could be said that participants in the experimental group saw that they had more freedom to direct their own English learning process. Even if it was a short period of time, only ten weeks, for only one course the results were quite outstanding. The next figures present trends of learners' self-perceptions towards their learning autonomy before and after the implementation.

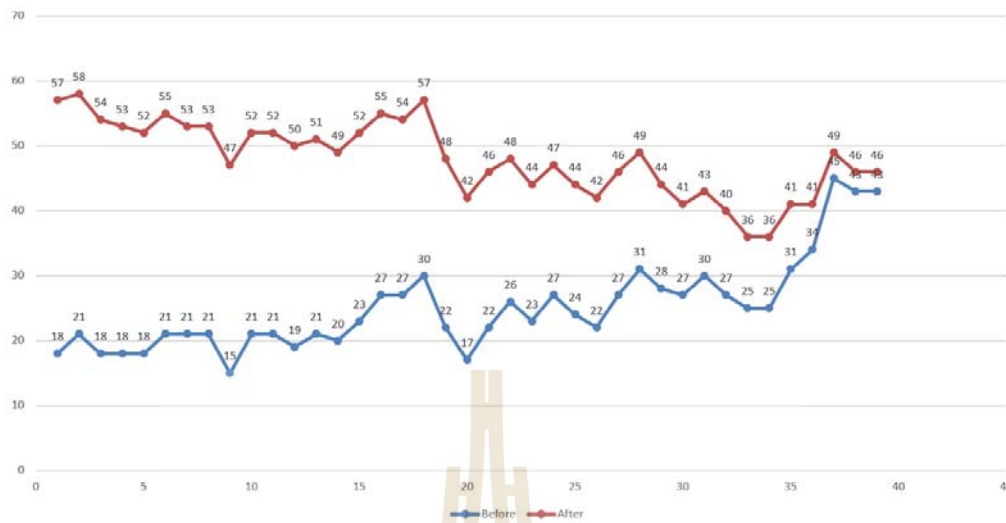


Figure 4.4 Trend of Self-Perception of Learning Autonomy Before and After the Implementation

These figures reveal that all participants perceived themselves as being more autonomous after learning English through the MacroSIM for ten weeks. The trend shows that participants who perceived themselves as having low autonomy at the beginning had changed a lot at the end. In contrary, the ones who were most autonomous before the implementation had changed less. The table below summarizes different values of learning autonomy of the participants in the experimental group divided by their different rating scales.

Table 4.22 Differences Value of Learning Autonomy of the Experimental Group

Rating Scale	Average Score (60)		Differences	Number of Participants	Percent
	Before	After			
1-10	39.20	44.60	5.40	5	12.82%
11-20	26.64	42.55	15.91	11	28.21%
21-30	23.45	49.64	26.19	11	28.21%
31-40	19.33	53.00	33.67	12	30.77%
Total				39	100%

This table presents differences value of learning autonomy of the experimental group and it demonstrates that each group of them perceives value of learning autonomy differently. The questionnaire has twelve items and the scale ranges from 1-5 therefore the total value for this learning autonomy questionnaire is 60. These four groups were divided according to different level of rating scales between before and after the implementation from 1-40. At the beginning of the course, there were 5 participants (12.82%) who perceived themselves had high level of learning autonomy (39.20), which was much higher than the average level (25.10), had changed slightly at the end of the course (5.40). Noticeably, their rating of learning autonomy level after the implementation (44.60) was lower than the average level (48.03) of the whole group. While another group of participants (28.21%), who rated their learning autonomy before taking the course at the average of 26.64, valued their learning autonomy higher at the end at the average of 42.55. They valued their learning autonomy 59.72% higher after ten weeks. Next, 11 participants (28.21%) who rated their learning autonomy before the implementation quite low (23.45), then after the implementation they valued it (49.64). That is 111.68% higher. The biggest group of participants (30.77%) valued their learning autonomy very low at the beginning (19.33) drastically changed their perception at the end of the course (53.00). That is 174.19% higher. The next table is presenting the results of this questionnaire of each item separately.

Table 4.23 Results of Participants' Self-Perceptions of Learning Autonomy

Learning Autonomy	Before			After		
	Average	S.D.	Ranking	Average	S.D.	Ranking
1. You can analyze/define your own learning needs.	1.85	0.94	11	3.79	0.80	10
2. You can set achievable learning objectives.	1.97	0.74	9	3.85	0.71	8
3. You can manage your time for your own learning process.	2.23	0.69	4	3.77	0.84	11
4. You can choose your own learning materials.	2.00	0.94	8	4.13	0.70	3
5. You can negotiate your own learning process.	2.10	0.77	6	4.00	0.79	7
6. You can select your own partners for pair/group work.	1.85	0.78	10	4.21	0.80	2
7. You can work on your own.	1.85	0.96	12	4.46	0.72	1
8. You can make choices about how work will be assessed.	2.46	0.84	1	3.85	0.71	8
9. You can assess discrete aspects of your own work.	2.31	0.86	2	4.03	0.71	5
10. You can assess the work of peers.	2.28	0.87	3	3.79	0.70	9
11. You can take responsibilities for your own learning outside the classroom.	2.08	0.93	7	4.13	0.80	4
12. You can monitor your own learning progress over time.	2.13	0.85	5	4.03	0.81	6
Average	2.09	0.58		4.00	0.48	

When take a look into details of each item of the questionnaire, the findings show that all twelve items in the questionnaire are rated higher at the end of the course. The average score of each item before the implementation took place was 2.09 and ten weeks later it reached 4.00. Interestingly, the number was almost a hundred percent higher. Moreover, the ranking of items in the questionnaire

before and after the implementation also tells something. The highest rank after the implementation was item number 7 stated that "You can work on your own." which received a pretty high score of 4.46. Obviously, item 7 was ranked as the last item from these participants' perceptions early in the course. The second highest rank after the implementation was item number 6 which stated "You can select your own partner for pair/group work" and received a score of 4.21. This item was ranked tenth at the beginning. The third rank was item 4 and the score was 4.13; it said "You can choose your own learning materials" which was ranked eighth before the implementation. Then, the fourth rank was item number 11 receiving the score 4.13 it said "You can take responsibilities for your own learning outside the classroom" which was ranked seventh before. The fifth rank was item 9 which stated that "You can assess discrete aspects of your own work". These findings show that participants in the experimental group valued their learning autonomy totally different after taking this course. The next part presents the findings of qualitative analysis from participants' diaries regarding their opinions about learning autonomy. The next table presents statistical results of learning autonomy of the experimental group before and after the implementation.

Table 4.24 Statistical Results of Learning Autonomy

Learning Autonomy	n	mean	S.D.	t	Df	Sig.
Pretest	39	2.09	0.58	14.13	38	0.00001**
Posttest	39	4.00	0.48			

**critical value is .01

The results identify that learning autonomy of participants in the experimental group were significantly different in their perception before and after learning English by using the MacroSIM program. The paired t-test results show that there was a significant difference in the mean scores of their beginning perception ($M = 2.09$, $SD = 0.58$) and after perception ($M = 4.00$, $SD = 0.48$) conditions; $t(38) = 14.13$, $p = .00001$. The next part is the results of qualitative analysis of participants' opinions regarding learning autonomy from their diaries.

4.5.2 Qualitative Results from the Diaries about Learning Autonomy

This part presents qualitative results from the diaries of these participants who shared their opinions about learning autonomy to serve as evidences to answer research question number 3, how do these participants perceive the value of learning autonomy. There were 13 comments that mentioned learning autonomy, below are some samples from their diaries translated to English.

1. *This course makes me more responsible to myself because I have to control myself to do the assignments and submit them according to the deadline without any control from the teacher. (Participant number 6)*
2. *From my self-observation I am more active to learn. I am more willing and more mindful to learn. I am so happy that I took this course and I have experienced in this style of learning. (Participant number 22)*
3. *After using MacroSIM I realized that I need to improve my grammar knowledge more. I could communicate in English but my grammar was not as correct as it should be. The way to help me to be better is I need to study more.*

I should try to study from other websites not rely only on one web. I like it when I used English with customers; it helps me to study English on my own. I could learn from teachers or from websites and learning is a long-life process.(Participant number 23)

4. *This course is useful for students as we could have experience in self-study. (Participant number 25)*
5. *Since the first day I've learned in this course, I've gained a lot of knowledge including TOEIC testing. It tells me that there are lots of things outside that we need to learn more, not only in the classroom. (Participant number 30)*

4.5.3 Discussion of the Findings about Learning Autonomy

The findings reveal that participants from different levels of learning autonomy valued their sense of learning autonomy differently at the end of the course. It seems that the ones who needed freedom in learning most were the ones who perceived their sense of learning autonomy at very low level in the beginning. On the other hand, the ones who perceived their sense of learning autonomy at high level didn't want more freedom in learning. It could be interpreted that these participants perceived their sense of learning autonomy was sufficient enough. They were certain their level of learning autonomy be able to direct their own learning process. It is in contrast with the group of low level learning autonomy as the findings pointed out that the participants in this group were more satisfied with the freedom they had. When they were given opportunities to direct their own learning process, they were more certain than before.

The findings also indicated that these participants were more productive, purposeful, and mindful on their own learning processes. They were more responsible of their assignments. They were aware of their mistakes and realized that they needed to improve themselves. Moreover, they also figured out how to overcome those mistakes. All participants were able to navigate their own learning procedure following their own interest. Moreover, they also demonstrated self-organized learning processes as the findings are presented in the next section.

4.6 Characteristic of Virtual Learning Environments of Autonomous Language Learners

This part dedicated to answer the fourth research question: What characteristic of the virtual learning environments created by these autonomous language learners look like? The analysis consists of two parts; qualitative analysis of the diaries and recorded video clips. The first part is presenting the findings of participants' learning processes which were analyzed from their diaries. The second part is the findings of participants' communication patterns in MacroSIM as a virtual learning environment.

4.6.1 Investigating Personal Learning Environment of Autonomous Language Learners

From participants' diaries, they always wrote about their opinions, feelings, and ideas related to three periods. Those comments were about before,

during, and after using MacroSIM. All comments in those three periods could be categorized into 4 groups; self-planning, self-awareness raising, self-evaluating, and conceptualizing. The tables below show the details of these four groups with frequency of comments that the participants in the experimental group wrote about.

1) Before using MacroSIM

In the first part of the diaries participants always wrote about how they prepare themselves before going to class to simulate in a role. This group was coded as 'Self-Planning' and it can be divided into four subgroups which were preparing, finding and studying information, accessing, and consulting.

Table 4.25 Results of Participants' Diaries Regarding Self-Planning

Self-Planning	Frequency (101)
1) Preparing	2
• Taking notes	1
• Preparing dialogue	1
2) Finding and studying information	42
• Vocabulary	14
• Content	13
• Conversation	6
• Sentences	4
• Topics	2
• Text from previous courses	2
• Sample expressions	1
3) Accessing	38
• Applications	13
• Google	10
• Websites	7
• Youtube	7
• Facebook	1
4) Consulting	19
• Friends	17
• Teacher	2

The findings above present components of the first step when these participants prepared themselves before taking a role. The second part 'Finding and studying information' consisted of the most comments (42 comments). Vocabulary and content were two topics that these participants were interested to study most. They had used many resources both human and non-human to study by themselves. There were only two entries that mentioned about the teacher, most of the time these participants had consulted with their friends.

2) During using MacroSIM

In the diaries, the participants wrote about taking a role in simulation and they reflected their feelings and opinions toward their performance. This part was coded as 'self-awareness raising' which means learners think and have awareness of the process of using English in MacroSIM, then they wrote their reflection in the diaries. It was divided into five subgroups; linking to their prior knowledge, context tells something, real situation are important, simulation helps develop language skills, and increasing adaptability skills.

Table 4.26 Results of Participants' Diaries Regarding Self-Awareness Raising

Self-Awareness Raising	Frequency (32)
1) Simulation helps developing language skills	9
2) Real situations are important	7
3) Linking to their prior knowledge	6
4) Context tells something	5
5) Increasing adaptability skills	5

3) After using MacroSIM

After they had performed in roles, they wrote about that experience and realized that using English in real situations were different from what they had thought. Some participants stated that everything went well as planned but some mentioned about their mistakes and they always came up with their own solutions to fix the problems.

Table 4.27 Results of Participants' Diaries Regarding Self-Evaluating

Self-Evaluating	Frequency (86)
1) Evaluate the language use in reality	51
• Vocabulary	20
• Structure and grammar knowledge	14
• Abbreviations	8
• Idioms/slang/informal language	5
• Misspelling	4
2) Re-planning to improve	35

Vocabulary and grammar knowledge were two language domains that these participants were concerned most about. After they had experienced using the language with foreigners and their friends; they found that abbreviation, idioms, slang, and informal language were always used. They also noted that they didn't understand well enough. Sometimes, they needed to look up the meanings and it delayed conversations. Some participants mentioned that they spelled some words incorrectly in the conversation but it was alright. Then, they reminded themselves to improve their vocabulary skills more. After they found some problems in using

English in the simulation, there were 35 comments that stated they had to improve themselves. The word 'improve' came after the word 'must' which means MacroSIM helps raise their awareness about the use of language in reality; as a result they intended to develop their language skill to be better.

4) Conceptualizing

At the end of participants' writings of each entry some of them summarized their own ideas about experiences that they had encountered. The table 4.23 presents the findings of participants' comprehension regarding three matters; language use in reality, awareness of unpredictable situations, and learning processes, they summed up after experiencing learning English through MacroSIM.

Table 4.28 Results of Participants' Diaries Regarding Conceptualizing

Conceptualizing	Frequency (18)
1) Language use in reality	11
2) Awareness of unpredictable situation	5
3) Learning processes	2

- **Language use in reality**

These three conclusions were from 17 participants, language use in reality was the most frequent that they wrote about. Below are some samples from their diaries.

1. *In reality, the language is more informal which is usually used among teenagers. (Participant number 1)*

2. *When I use the language in reality I have to adapt it sometimes such as there are differences in written and spoken language. (Participant number 6)*

3. *The language that I use is changed according to context. At first, I thought that I'll use this sentence but we can use other sentences instead. For example, I asked 'What are you doing?' and my friend used 'What have you been up to?'. (Participant number 13)*

4. *Foreigners usually use informal language which is difficult to understand but if I don't get it I'll ask them directly. At first, I thought that I must use the language with correct grammar but in reality, trying to communicate the meaning is just fine. (Participant number 14)*

5. *Sometimes, my interlocutor used 'Pl' and 'Thx' which I don't understand and I've never used it before. So, I got confused and cannot continue the conversation. (Participant number 17)*

- **Awareness of unpredictable situations**

When these participants performed in a role with their friends or used English with foreigners they realized that everything does not always happened as they have planned.

1. *Sometimes things did not occur as I thought when I have conversation with foreigners. I found that they often used abbreviations which were hard understood. (Participant number 7)*

2. *I found it's a challenge when I changed the role from customer to be a waitress; I didn't know what food the customer would order or what kind of service they would ask for. (Participant number 25)*

3. *In the simulation of a job interview, I could sense that in the actual setting of an interview I cannot know what questions will be asked. (Participant number 38)*

- **Learning processes**

1. *Self-directed learning helps us gain more knowledge that we can develop. It is like in this course which helps us improve communication skills a lot. (Participant number 35)*

2. *There are various types of learning, reading books, watching movies, and listening to music are all self-studying. Including playing games, we can learn something from it too. (Participant number 35)*

These findings are empirical evidences to show that participants in the experimental group demonstrated self-organized learning processes for teaching themselves about English use in restaurants. Their process of language learning in a virtual world starts with preparing, assessing, evaluating, and conceptualizing. All these four steps occurred without any involvement from the teacher. The first step is planning which reveals that participants could generate their own lessons for studying what they want to know. They had used information from non-human and human resources. The second step is assessing, which reveals that participants were aware of their language production. Then, evaluation is the third step and it identifies that these participants always judged their language performance. Evaluation received the highest frequency of comments from all 39

participants and it usually came with re-planning. Re-planning is the last step of evaluation and the findings also show that these participants were mindful to fix their problems or improve their English skill. Evaluation could be considered as the step of identifying needs, they realized that there were some gaps between their knowledge and reality. Then, re-planning is the step of projecting themselves how to fulfill those needs. From these findings, it could be interpreted that these participants were conscious and intend to develop themselves. They have focus and were mindful of their tasks. On top of that, some participants also indicated that they comprehend some concepts that they experienced from learning and using the language through MacroSIM. The next section illustrates quantitative findings that show communication patterns of these participants in the experimental group through the virtual world.

4.6.2 Quantitative Results of Communication Pattern in MacroSIM

In this part, the data was taken from video clips that participants of the experimental group submitted in the fourth week of the experiment. This course, English for Restaurant and Catering Services, was conducted in three 50-minutes periods. The experiment was ten weeks long so it was not necessary to do the simulation every class. They could spend time to study online resources for preparing themselves or observed others in the virtual world. The fourth week was the week that every participant had submitted their video files,

so it was chosen for data analysis. The data was analyzed from recorded video clips that the participants recorded from their computer screens by using screen recorder software. This is a trial version so the recording time is only 10 minutes for each file. The participants had to record their simulation for four roles; customer, waiter or waitress, chef, and manager, for one hour each. They were required to submit the video files to the server after class.

Table 4.29 Roles Taking from Week 4th of the Experiment

	First speaker	Second speaker	Time		First speaker	Second speaker	Time		First speaker	Second speaker	Time
1	01Manager	03Chef	10	27	12Waitress	17Customer	10	53	21Manager	27Chef	10
2	01Customer	15Waitress	10	28	12Waitress	16Customer	10	54	22Waiter	36Customer	10
3	01Chef	03Manager	10	29	12Manager	16Chef	10	55	23Waitress	30Customer	10
4	02Customer	38Waiter	10	30	12Manager	16Waitress	10	56	24Waitress	29Customer	10
5	02Customer	15Waitress	10	31	13Customer	29Waitress	10	57	24Customer	32Waitress	10
6	02Manager	20Waiter	10	32	13Waitress	29Customer	10	58	24Chef	29Manager	10
7	03Customer	38Waiter	10	33	13Waitress	24Manager	10	59	26Customer	39Waiter	10
8	03Customer	15Waitress	10	34	13Chef	19Manager	10	60	26Waitress	33Customer	10
9	04Customer	18Waiter	10	35	13Chef	16Manager	10	61	26Waitress	33Manager	10
10	04Waitress	07Customer	10	36	13Manager	16Chef	10	62	26Manager	33Waitress	10
11	05Customer	08Waiter	10	37	13Manager	19Chef	10	63	28Customer	39Waiter	10
12	06Manager	29Chef	10	38	14Chef	16Manager	10	64	31Waitress	35Manager	10
13	06Manager	39Chef	10	39	14Waitress	17Customer	10	65	32Chef	34Manager	10
14	06Chef	39Manager	10	40	14Waitress	16Customer	10	66	33Waitress	37Customer	10
15	08Manager	16Waitress	10	41	15Waitress	20Customer	10	67	37Waiter	39Customer	10
16	09Customer	19Waiter	10	42	15Manager	20Chef	10				
17	10Customer	38Waiter	10	43	16Customer	17Waiter	10				
18	10Customer	15Waitress	10	44	18Customer	37Waiter	10				
19	10Chef	20Manager	10	45	18Customer	19Waiter	10				
20	10Manager	20Chef	10	46	18Waiter	37Customer	10				
21	10Waitress	15Manager	10	47	19Waiter	37Customer	10				
22	11Waitress	25Customer	10	48	19Waiter	31Customer	10				
23	11Customer	19Waiter	10	49	19Manager	37Chef	10				
24	12Customer	14Waitress	10	50	19Manager	31Chef	10				
25	12Chef	17Manager	10	51	19Customer	37Waiter	10				
26	12Waitress	14Customer	10	52	20Customer	38Waiter	10				

This table presents role taking of each participant in week 4, it shows participant numbers with their roles and the recording times. The first speaker was the one who initiated the talk to the second speaker and each talk took 10 minutes. This is an example of the experiment and it can be noticed that the participants took several roles depending on their potential. The data of

communication patterns of the experimental groups were collected from these 67 files of 670 minutes. The next table presents connections of each participant with time use when they are doing the simulation, in a matrix graph.

		Second speaker																										
		Colun	P3	P7	P8	P14	P15	P16	P17	P18	P19	P20	P24	P25	P27	P29	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39	Total	
First speaker	P1		20				10																				30	
	P2											10													10		20	
	P3																									10	30	
	P4																											20
	P5																											10
	P6																										20	30
	P7																											0
	P8																											10
	P9																											10
	P10																										10	50
	P11																											20
	P12																											70
	P13																											70
	P14																											30
	P15																											20
	P16																											10
	P17																											0
	P18																											30
	P19																											50
	P20																											10
	P21																											10
	P22																											10
	P23																											10
	P24																											30
	P25																											0
	P26																											40
	P27																											0
	P28																											10
	P29																											0
	P30																											0
	P31																											10
	P32																											10
	P33																											0
	P34																											0
	P35																											0
	P36																											0
	P37																											10
	P38																											10
	P39																											0
Total		20	10	10	20	50	80	40	10	50	50	10	10	10	10	50	10	20	10	30	10	10	10	60	40	50	670	

Figure 4.5 Matrix Graph of the Role Simulation of the Experimental Group

This matrix graph displays the overview of the connections among these participants when they had applied English as a medium of communication. In the sense of a constructive learning environment, learners should have freedom in their decision making and it is the main objective of designing MacroSIM

lessons. From this graph it can be seen that participants were free to have conversations with whoever they prefer, they could have two or three interlocutors at the same time if they had another friend who wanted to talk too. They could have a planned conversation or by chance if there were some friends who just entered the scene. The length of time of each participant was different as the program allowed them to accumulate the time for one hour of each role for the whole semester.

The most initiative speakers were participant number 12 and 13 who both did 70 minutes talking with their friends. Table 4.29 indicates that participant number 12 simulated in all four roles; as customer (10 mins.), waitress (30 mins.), chef (10 mins.), and manager (20 mins.), communicating with three friends. Similarly, participant number 13 performed in all four roles; as customer (10 mins.), waitress (20 mins.), chef (20 mins.), and manager (20 mins.), with four friends. The most frequent participant of whom people came to communicate with was participant number 16. She spent 80 minutes talking with her five friends in all four roles as customer (30 mins.), waitress (20 mins.), chef (20 mins.), and manager (10 mins.). Table 4.30 reveals the total time that each participant spent performing the language in week 4th.

Table 4.30 Total Time Spent in the Simulation of Week 4th of the Experiment

No.	1 st speaker (mins.)	2 nd speaker (mins.)	Total (mins.)	No.	1 st speaker (mins.)	2 nd speaker (mins.)	Total (mins.)
P1	30	0	30	P21	10	0	10
P2	30	0	30	P22	10	0	10
P3	20	20	40	P23	10	0	10
P4	20	0	20	P24	30	10	40
P5	10	0	10	P25	0	10	10
P6	30	0	30	P26	40	0	40
P7	0	10	10	P27	0	10	10
P8	10	10	20	P28	10	0	10
P9	10	0	10	P29	0	50	50
P10	50	0	50	P30	0	10	10
P11	20	0	20	P31	10	20	30
P12	70	0	70	P32	10	10	20
P13	70	0	70	P33	10	30	40
P14	30	20	50	P34	0	10	10
P15	20	50	70	P35	0	10	10
P16	10	80	90	P36	0	10	10
P17	0	40	40	P37	10	60	70
P18	30	10	40	P38	0	40	40
P19	50	50	100	P39	0	50	50
P20	10	50	60				

This table identifies that the participants in the experimental group had different use of time in the simulation. The total period of time that these participants did the simulation for 670 minutes so the average time was 17.18 minutes. Participant number 19 had spent the longest period of time in the simulation during week 4. Table 4.29 reveals that he initiated the talk with two friends and acted as the second speaker with another four friends. In detail, it indicates that he performed as the first speaker in three roles; as customer (10 mins.), waiter (20 mins.), and manager (20 mins.) Then, he simulated as the second speaker to another group of his friends in three roles as waiter (30 mins.),

chef (10), and manager (10 mins.).

These results from tables 4.29, 4.30 and figure 4.5 give an overview of how MacroSIM can accelerate communication skills. These participants were stimulated to collide with the tasks that required them to apply their English knowledge every week. The experiment was for ten weeks with three 50-minutes periods. There were altogether 4 roles that these participants needed to apply their English skills for 60 minutes each. Therefore, these participants had to use productive skills of English for 240 minutes to communicate in the restaurant business. Furthermore, they also used their receptive skills of English to make themselves be ready for the simulation. That means MacroSIM provides the opportunity to integrate all four skills; listening, speaking, reading, and writing for acquiring and practicing their English knowledge. The next section presents the data analysis for qualitative results of the video clips.

4.6.3 Qualitative Results from the Video Clips

The main objective of a language production is for meaningful communication therefore this current study emphasizes on meanings that the participants were trying to convey. It doesn't mean that grammatical structure is not important as grammar skill can be developed throughout the process by practicing. That is the main purpose of this program, MacroSIM, which was designed to foster the participants to use English. Language use in the restaurant

business consists of many domains of language knowledge; however, the most important aspect is its practical sense. Face-to-face situations require instant and simultaneous correspondence in which language learners need more than grammatical forms the knowledge of linguistic functions are also crucial. Hence, qualitative data analysis for the language use in this part focuses primarily on the meanings of the expressions and how did these participants formulate their language knowledge to interact in these contexts.

In this part, pragmatic notion is applied to analyze English use in the simulation to investigate how proficient the participants in the experimental group perform English. Pragmatic competence is the ability of a language learner to use the language properly in a variety of contexts. In order to see how well these participants apply their English knowledge practically, it could be easier to compare their ability of the language use in different contexts. Two scenes were chosen for the analysis; they were a scene in a restaurant and a scene for a job interview. These two scenes were from the simulation of participant number 19. Participant number 19 was the one who had the longest period of time using English with friends in MacroSIM in the fourth week. He was also the only one who spent time to be both the first and the second speaker. Therefore, his ability in using English is interesting in terms of a language user who had different perspectives in applying the language in various contexts.



Figure 4.6 A Simulation Scene in a Restaurant From a Video Clip

This is a scene in the virtual world from a video clip of participant number 19. This participant named his avatar as 'Lahmton' and this scene was taken from his simulation as a waiter in a KFC restaurant. He was taking orders at the counter from four customers. These customers were simulated by participant number 9 (as Mable 258), 11 (as samook), 18 (as H4ppySmil3), and 31 (as PuddingElla). There were some other participants in the scene just observing such as participant number 2 (as MamiaoKm), 10 (as kattysopink), 13 (as Astronuat), 20 (as Cattharine), and 37 (as itonie420). Below is an excerpt in verbatim transcription of this scene for five minutes.

Table 4.31 An Excerpt From a Simulation Scene in a Restaurant

1. samook: <i>ordwer olease</i>	24. Mable258: <i>I'd fried chicken set 299 pls</i>
2. samook: <i>order please</i>	25. Cattharine: <i>I'd like french fried jumbo four set please.</i>
3. Mable258: <i>order please</i>	26. Lahmton: <i>Thank you very much</i>
4. PuddingElla: <i>I want to order</i>	27. kattysopink: <i>hi</i>
5. Lahmton: <i>Yep</i>	28. Lahmton: <i>Just a moment pls</i>
6. Lahmton: <i>That fine</i>	29. PuddingElla: <i>well.</i>
7. Lahmton: <i>May I reccomend U</i>	30. Lahmton: <i>Here your are maam.</i>
8. Cattharine: <i>I'd like Fried chicken set chujai 399 baht please.</i>	31. PuddingElla: <i>Thanks</i>
9. PuddingElla: <i>set 299 and egg tast</i>	32. H4ppySmil3: <i>order please</i>
10. Lahmton: <i>Alright</i>	33. Lahmton: <i>Your welcome</i>
11. Lahmton: <i>299 pls</i>	34. PuddingElla: <i>Have a nice day!</i>
12. PuddingElla: <i>pepsi 2</i>	35. Lahmton: <i>Yep</i>
13. Lahmton: <i>Oh</i>	36. H4ppySmil3: <i>I want valentine 2 set</i>
14. samook: <i>I'd like french fried jumbo please</i>	37. Lahmton: <i>OH</i>
15. Lahmton: <i>OK</i>	38. Lahmton: <i>That fine</i>
16. PuddingElla: <i>How much?</i>	39. H4ppySmil3: <i>How much?</i>
17. Lahmton: <i>299 for box set</i>	40. Lahmton: <i>Today thay have some promotion.</i>
18. Lahmton: <i>and 2 pepsi</i>	41. Lahmton: <i>it for sell</i>
19. Lahmton: <i>All about 315 baht pls</i>	42. samook: <i>bill please</i>
20. PuddingElla: <i>great</i>	43. Lahmton: <i>199 baht sir.</i>
21. samook: <i>and jumbo pepsi</i>	44. H4ppySmil3: <i>here you are.</i>
22. MamiaoKm: <i>Hello</i>	45. Lahmton: <i>OK</i>
23. PuddingElla: <i>here U are</i>	

This excerpt consisted of 45 expressions from 8 participants; participant number 19 was the main character and acted as a waiter. In the file submission, he indicated that this act was for him and participant number 31 who simulated as a customer. This means that this video clip was intended to record his simulation with participant number 31 and the other participants came to talk to him incidentally. The script also shows that participant number 19 (Lahmton) communicated most (21 turns) and participant number 31 (PuddingElla) had 9

turns. Even though, there were several grammatical mistakes and misspelling of some words their English was comprehensible and the dialogue flew naturally. The use of English of participant number 19 was appropriate to the role of a waiter, he used linguistic features many times to show politeness such as *'pls'*, *'maam'*, and *'sir'*. His ability of turn-taking was good and it shows that he could control his discourse. He also used some linguistic features for showing attention like *'Yep'*, *'That fine'*, *'Oh'*, *'OK'*, and *'Alright'*. Moreover, his expressions number 26, 28, 30, and 33 (i.e. *'May I reccomend U'*, *'Thank you very much'*, *'Just a moment pls'*, *'Here you are maam'*, and *'Your welcome'*) were used for comforting the customers. These results demonstrate that his language ability was skillful and he understood these linguistic functions well enough so he could apply them appropriately. In addition, these results also reveal that he could integrate the notion of English with his social skills effectively. The next section presents another scene of his simulation as a manager who had a job interview with a chef.



Figure 4.7 A Simulation Scene of a Job Interview

This scene was taken from a job interview situation of participant number 19 in week 9 of the experiment. Participant number 37 acted as itoonnie420 and applied for a chef at a restaurant. Firstly, all participants had to create a job advertisement and posted it on Facebook Group for announcing the vacancy. Then, they made an appointment for interviewing. In the role of restaurant manager, they had to interview three applicants for two positions; a waiter/waitress and a chef. Participant number 37 was the first applicant for the chef position in this restaurant. An excerpt of this scene is presented as follows.

Table 4.32 An Excerpt from a Simulation Scene of a Job Interview

1. itoonnie420: <i>Hello</i>	15. Lahmton: <i>Why are you interested in this position?</i>
2. Lahmton: <i>Hello, sir</i>	16. itoonnie420: <i>i want to apply for chef because</i>
3. itoonnie420: <i>good afternoon</i>	17. itoonnie420: <i>i love to cook</i>
4. Lahmton: <i>Please, introduce your self</i>	18. Lahmton: <i>That right</i>
5. itoonnie420: <i>my name is chanon promwetchayanon</i>	19. Lahmton: <i>Can you work with people?</i>
6. itoonnie420: <i>I'm graduated from nakhon ratchasima rajabhat university</i>	20. itoonnie420: <i>yes i can</i>
7. Lahmton: <i>sound good</i>	21. itoonnie420: <i>my personality</i>
8. itoonnie420: <i>in business english major</i>	22. itoonnie420: <i>i'm friendly guy</i>
9. Lahmton: <i>wow</i>	23. Lahmton: <i>yep</i>
10. Lahmton: <i>alright</i>	24. Lahmton: <i>sound good</i>
11. Lahmton: <i>What do you know about our company?</i>	25. Lahmton: <i>Where do you see yourself in next 5 years?</i>
12. itoonnie420: <i>this company have a five star of michelin</i>	26. itoonnie420: <i>maybe i'm the manager of this company</i>
13. Lahmton: <i>Yeah</i>	27. itoonnie420: <i>*manger</i>
14. itoonnie420: <i>and this company is a number 1 of thailand</i>	28. itoonnie420: <i>i want to work with this company</i>
	29. itoonnie420: <i>so i must work hard to be the manager</i>

This excerpt lasted five minutes and there were 29 expressions altogether. There were 13 turns from participant number 19 and 16 turns from participant number 37. The language use in this scene was more formal and more accurate than the previous one. Participant number 19 demonstrated his English skills suit the role. He used full sentences and his grammar and punctuation were mostly correct. The meanings of the questions were appropriate for job interviewing which meant he was well-prepared. He still applied linguistic features to show his attention in the conversation which made it go smoothly. Participant number 37 seemed to be less proficient in English but his answers were understandable.

All of his sentences were in small letters which could be inferred that he thought that this simulation represented face-to-face conversation. At the end of the conversation he tried to correct his misspelling of the word 'manage' to 'manger' which could be interpreted that he was aware of his mistake. Although, it was not correct but he tried to add more meaning for giving reasons to support his ideas. The next section is the discussion of the qualitative results and ends with a summary of this chapter.

4.6.4 Discussion of the Findings about Virtual Learning Environment

4.6.3.1 Communication Pattern in a Virtual Learning Environment

The chord graph summarizes all interactions from the fourth week of the experiment. It helps to illustrate the connections of all participants at once. Each node is labeled by the numbers of participants and represents as an arc in their social network. The length of these arcs is different because it depends on the length of time and the numbers of people with whom each one was talking to. Colors of each line and arcs were programmed by the software which means to help distinguish the lines easier.

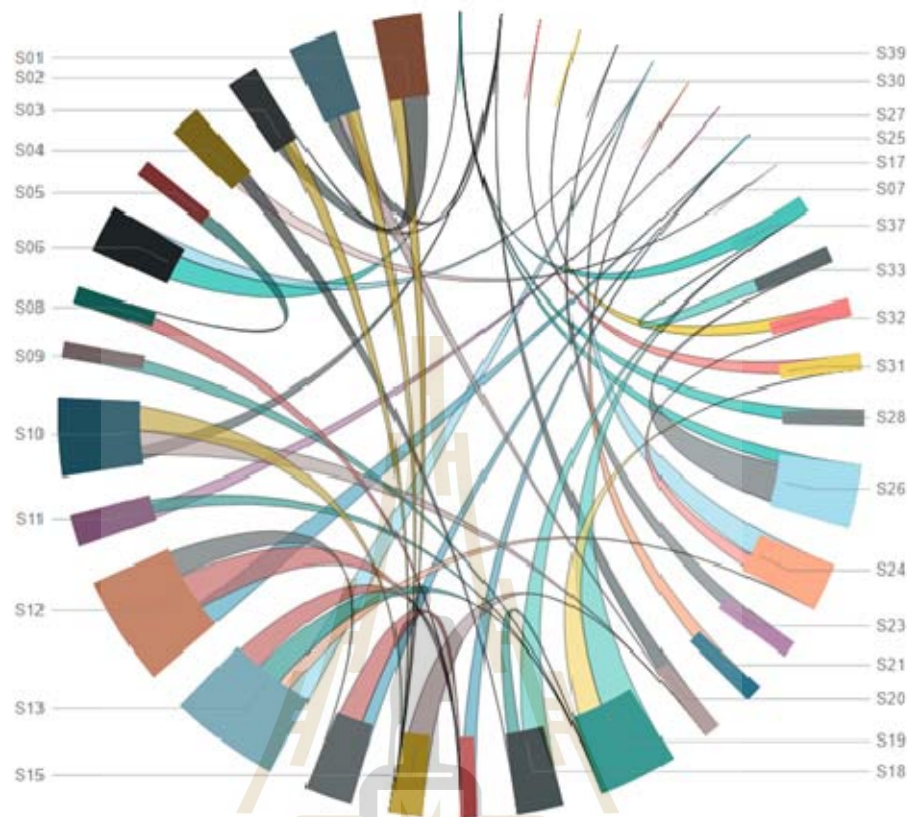


Figure 4.8 A Chord Graph of All Interactions of the Experimental Group

It could be seen that all participants in the experimental group were active to perform the tasks. They all directed themselves to reach people that they prefer at any time they want. They were free to make decision for their own choices, whether they wanted to perform or not. They could choose to prepare themselves until they felt ready to do the simulation. Even though they had full freedom to do things as they preferred but all of them were responsible to submit their works on time.

4.6.3.2 Virtual Learning Environments of Language Autonomous

Learners

This graph summarizes the qualitative results from all participants' diaries when they directed their own learning process for acquiring English for the restaurant and catering services. There are three main steps that all participants employed; planning, assessing, and evaluating. All steps are controlled by the participants themselves which means they were conscious of their learning processes. They were mindful of their own studying and attempted to use English purposively. Some participants crystallized their ideas as a concept that they perceived from their own experience. This could be explained as the model of learning loops of autonomous language learners in a virtual world. Each step of the model is described below.

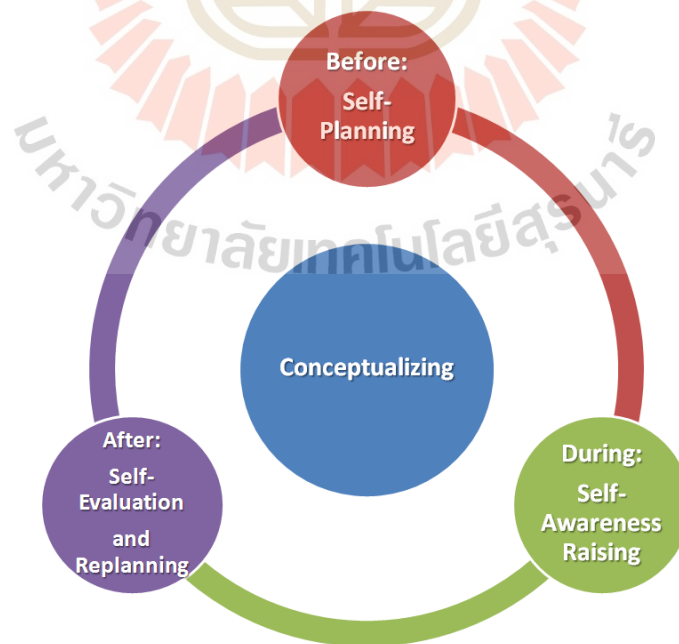


Figure 4.9 A Self-Driven Learning Model of Autonomous Language Learners

1. Self-Planning implies that all of participants of the experimental group were able to generate language learning lessons according to their own interests and to prepare themselves to do the task.
2. Self-Awareness Raising shows that they were aware of all language processing; both expressing and receiving information.
3. Self-Evaluating combined with Re-Planning illustrates that the participants had a sense of self-judging on their own language production. They also made a commitment to themselves to study more about their mistakes.
4. Moreover, the results also reveal that some participants had a step of Conceptualization as they crystallized some notions after learning English through MacroSIM.

4.7 Summary

MacroSIM supports both strong and weak English learners as it gives them choices to base their own skills on. In the diaries, the participants always claimed that they felt more relaxed and had more courage to speak English. It could be inferred that using English in MacroSIM make them feel less stressed as its environment has less conditions and makes them feel less anxiety. Moreover, MacroSIM also increased a sense of cooperation and assistance as there were no

competitive tasks. Therefore, participants who were good at English could spend more time helping their friends. They demonstrated that they were responsible for their learning processes because they needed to control themselves to be able to achieve the tasks. MacroSIM also increased a sense of awareness in using English in reality which it was unable to teach directly.



CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter concludes the study by reflecting on its research purposes. It is divided into three sections. Firstly, it presents a summary of the study as a background of the project. Then, the significance of the findings is described and followed by pedagogical implications. Lastly, it outlines the limitations of the study and recommendations for further research.

5.1 Summary of the Study

5.1.1 Principles of the Language Learning Environment

This study is a quasi-experimental study with two groups of participants: experimental and control groups. Its purpose was to investigate the learning environments of autonomous English learners who had experienced learning English through MacroSIM. The implementation of this study was underpinned by twin concepts of postmodernism and constructivism. Postmodernism explains that knowledge is constructed internally in one's mind and does not stem from discovery. In constructivism, learning a language is a process of meaning construction according to the conditions of its environment. Importantly, meaning is a social construction and needs contexts for comprehension. This study employed these two

notions: learners needing context to comprehend language and having the opportunity to apply their language skills to those meanings efficiently.

The concept of constructivism was applied in this study to create a language learning environment to enable participants to the use of English in real-like experiences. The learning environment is comprised of several conditions that could help the learners to interpret meanings appropriately. Naturally, the environment is a system that has conditions in itself to control things. It is essential to all language learners to be able to apply their meaning-making mechanisms (Lian, 2000 and 2004) to make understanding of language occurrence in the real setting. Therefore, language learners need to know how to manipulate their linguistic ability to conform to the conditions of that language system. To accelerate the sense of language learning, MacroSIM is designed to have fewer conditions that are not relevant to the learning process and to increase conditions that arouse the participants to use English.

5.1.2 Learning Autonomy

Learning autonomy is crucial for the learning process in the 21st century, not because technology speeds up everything but because it offers a freedom of choice that is more useful for the learning process. This study focuses on freedom as the main factor in the learning process. The definition of learning autonomy in this study is described as ‘an ability of learners that can plan and

control their own actions to do things at their own will. This learning ability includes re-planning if some goals cannot be reached; they need to be able to re-plan to try another way'. This means that the learning process is dynamic and adjustable according to the situation, so learners should be mentally and physically free to choose activities that suit them in that situation. MacroSIM is designed to provide them with a freedom of choice and to try to reduce obstacles to learning as much as possible. The program is created as a learning environment designed to accelerate a sense of self-learning. Self-learning requires a sense of self-control and it cannot happen without freedom.

A learning environment is crucial for learning autonomy as it is comprised of several conditions which impact directly on the efficiency and efficacy of the process. Learning autonomy is a state of mind which cannot occur in oppressive environments. Humans have the significant ability to changing themselves following different environments; and autonomy is an intellectual skill that is responsive to the conditions of that environment. Its changes correspond to the conditions within that system for two reasons; 1) for self-maintenance and 2) for creating new structures as a consequence of environmental influences (Fosnot, 2005). MacroSIM is intentionally created as a learning environment that stimulates English learners to exercise their learning autonomy in order to learn English in realistic settings. Learners were

independent without any stipulations. This offered them freedom and made them rely on their own self-control.

5.1.3 Constructivist Learning Environments

The design of the learning environment in this study is based on the concept of learning in constructivism which describes it as a personal process for each individual that develops oneself through several conditions of his or her environment. Learning is a developing process and it relates to thinking skills which require time to adjust one's perceptions. If there are some errors that happen between learners' previous knowledge and realities, time is needed for readjusting their perceptions to the new experience. Therefore, time is a very important factor for the learning process and learners should be able to manage their time to learn things at their own pace. As Alvin Toffler (1970) mentioned, learning is to 'learn, unlearn, and relearn' things. Thus, this study considers that the learning process is not always about new things but also unlearning things that contradict with reality. This also means consolidating known things from what learners have studied into practice. This is very important for the human learning process. It is consistent with a definition of learning from a neuroscientist, Hideaki Koizumi, who said 'learning deals with the internal generation of concepts in response to external stimuli (including concepts)' (Koizumi, 2004). Learning is self-structuring process that can be strengthened by connecting itself with its environment.

All conditions in the MacroSIM environment interact directly with the intellectual mechanism of each participant to interpret meanings for perceiving in terms of using English in reality. MacroSIM is a learning system that helps learners to communicate in English on the basis of their 'operational history' (Lian and Sussex, 2018). Furthermore, it also supports them effectively to negate mistaken past experiences. When learners found that their previous knowledge contrasted with the task, learning needs emerged, what Fosnot called 'disturbers of equilibrium' (cited in Lebow, 1993). Learners' awareness is raised according to their needs and these needs stimulate them to think and to find a way to react more properly. Additionally, constructivism fosters the process of self-regulation as its environment is open for connection without limitations of time and place. The more learners can connect with knowledge, the more they understand it. Constructivist learning environments should support all the processes of learning and unlearning as they are essential for solving misunderstandings of prior knowledge.

5.2 Significance of the Findings

5.2.1 The Findings of MacroSIM Implementation

After implementing MacroSIM for ten weeks, the participants in the experimental group had improved their English proficiency significantly in the areas of task fulfillment. When compared with the control group, which was taught by an

experienced English teacher, whose posttest results showed no significant improvements at all.

1) The Effectiveness of MacroSIM in terms of Language Proficiency

The statistical results identify that participants in the experimental group performed English in their posttest responses significantly different while participants in the control group did not. According to the four language criteria, there was a significant difference in posttest responses from participants in the experimental group. Their posttest scores showed that their use of English in 'task fulfillment' aspects were significantly different while the control group did not have any significant difference at all. The experimental group's posttest responses were much longer than their pretest responses as the mean difference was 11.31 while the control group went backwards as their mean difference was -0.43. It was found that there were two groups of language patterns that emerged from the posttest responses of both groups. They are as follows:

Table 5.1 Two Groups of Language Pattern Emerge From Posttest Responses

<p>A) Enriching and complexifying the meanings to be communicated.</p> <ol style="list-style-type: none"> 1. Providing more politeness features 2. Providing more explanations or details 3. Making suggestions 4. Using a variety of alternative sentences or phrases 5. Using spoken language features 	<p>B) Providing wide range of vocabulary.</p> <ol style="list-style-type: none"> 1. Using alternative vocabulary 2. Drawing on and applying new vocabulary
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Moreover, qualitative analysis indicated that participants in the experimental group more frequently changed their posttest responses, resulting in higher scores. These changes emerged as two groups of language patterns as presented in Table 5.1 above. However, no evidence was found that the control group made use of alternatives or a more varied vocabulary. It seems that they tended to stick to the few phrases that they had memorized earlier on their studies. Qualitative results also suggested that participants in the experimental group used more than just language skills, also using their imagination and creativity to make a scene of the given situation and create sentences for the characters in those circumstances. These are clear indications that the experimental group exhibited risk-taking behaviors whereas the control group stayed with the familiar structures and vocabulary. This could be implied that participants in the experimental group felt more confident in their language ability so they could express more ideas through the language. The evidence was found from their longer posttest responses and also in their applying of a wide range of alternative vocabulary. Noticeably, their grammatical scores decreased because they were writing longer and more complicated posttest responses that inevitably placed greater stress on their grammatical competence. Their increased fluency and expressiveness and the ability to complete the tasks effectively more than compensated for the grammatical deficiency which can be attended to in a more leisurely manner once their ability to

communicate effectively has been firmly established (in much the same way as a child masters communicative competence before moving, if ever, to grammatical accuracy).

2) Efficiency of MacroSIM in respect of Learning Autonomy

The results of learning autonomy are very interesting as all participants reported that they were more autonomous in their learning. Especially, the case with the participants who valued their learning autonomy very low at the beginning; they had changed their perceptions drastically by the end of the course. For those who thought that they were already at a very high level of learning autonomy at the beginning improved their scores by only a small amount by the end of the experiment. It could be said that MacroSIM successfully provided everyone with the opportunity to exercise their learning autonomy individually while studying English. The statistical results identify that the experimental group perceived themselves as having more learning autonomy than at the beginning of the course. The average score of learning autonomy at the beginning was 25.10 (S.D. 6.98) while after the implementation the average score was 48.03 (S.D. 5.73).

There were 13 comments about learning autonomy found in the experimental group's diaries. They claimed that this course made them more productive, purposeful, and mindful towards their processes of studying English.

They were aware of their mistakes using English and tried to improve themselves by studying more for the next simulation. In addition, the qualitative results from participants' diaries were very interesting. It was found that these participants wrote about using MacroSIM for studying English similarly. All entries could be grouped into three periods of using the program as before, during, and after. Then, all comments were categorized into four subgroups: self-planning, self-awareness raising, self-evaluating and self-replanning, and conceptualizing. The graphic below demonstrates the learning loop of the experimental group.

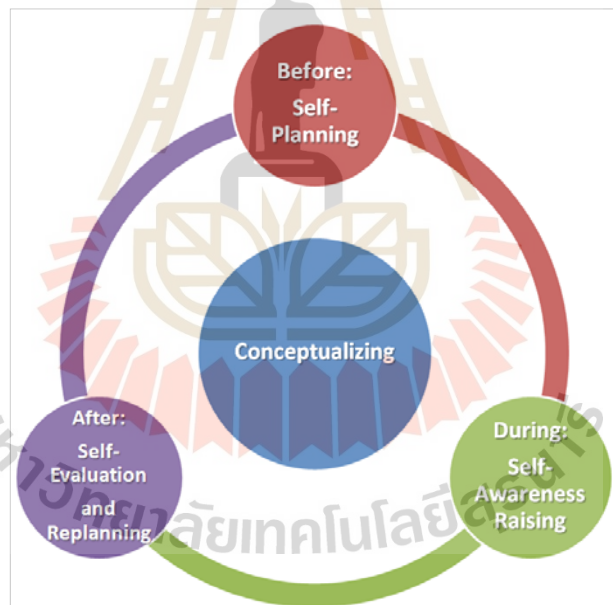


Figure 5.1 Learning Loop of Language Autonomous Learners

This graph shows a process of self-driven English learning by these autonomous learners that proceeded continuously throughout the ten weeks of the experiment. Statistical testing also showed that there was a significant difference in

their perception of learning autonomy before the implementation (Mean = 2.09, SD = 0.58) and after the implementation (Mean = 4.00, SD = 0.48) conditions; $t(38) = 14.13, p = .00001$.

5.2.2 The Findings of the Language Functions in the Service Business

Context

Politeness and appropriacy are important in the restaurant context. The notion of using a language to ease the difficulty of some situations seems to be difficult to teach in a traditional teaching approach. Participants in the experimental group demonstrated their proficiency in using English as a politeness strategy to respond to the given tasks appropriately. Politeness and appropriacy was the highest improvement among the four language criteria of the experimental group as its median difference was 1.34. To the contrary, the control group received the lowest score in this aspect (median difference -0.33). English in the experimental group was intentionally changed in their posttest responses and it could be considered as a politeness strategy. According to those five emerging language patterns found and posttest responses of the experimental group differed from the control group in all aspects. All five emerging language patterns were used as language strategies to respond to the situations more properly. They were providing more politeness features, providing more explanation or details, making suggestions, using a variety of alternative sentences or phrases, and using spoken language features.

It is obviously seen that the posttest responses were changed by adding more meaning to respond to the situations so become better than in their pretest responses. In addition, their use of English was more appropriate for the service business as they added apology phrases like *'I'm terribly sorry sir'*, *'I'm sorry to tell you that'*, *'sorry to interrupt you sir'*, and *'I'm sorry about that'*. Some language features of generosity were also found for example *'I'll fix it immediately and not let it happen again'*, *'just a moment, please'*, *'Have a nice day'*, *'It's nice to hear that'*, and *'Please, wait a second'*. On top of that, their use of natural language like spoken language features was found more frequently and had more variety than the control group. The results revealed that there were more participants in the experimental group who applied spoken language features initially in their posttest responses. In the pretest assessment, these features were found 27 times out of 15 participants while in the posttest it was found 38 times out of 27 participants. Furthermore, their use of these features was more varied as in the pretest they wrote only *'Oh'* but in their posttest responses they used *'Ah'*, *'Umm...'*, *'Oh God'*, *'Oh really!'*, and *'Oh sound good!'*

5.2.3 Participants' Satisfaction with MacroSIM

The descriptive statistic results reported that participants in the experimental group felt satisfied with the program to a high level with a mean score of 3.92. The highest mean score (4.59) was about their experience of the freedom of

learning English with MacroSIM tasks. Qualitative results from the analysis of their diaries suggest that they felt satisfied with the program. They mentioned most about the advantages of the program (88 comments) and said that it is useful and it helps them learning English a lot. Even though the program did not provide any content or exercises but they claimed that MacroSIM assisted them to learn English in many ways. They could practice using English in a restaurant context, they could develop communication skill, they had more chances to speak with foreigners, they knew more about food and cooking, they knew more about job applying, they had learned new information and vocabularies, and they were an assistant to their friends.

On the other hand, there were only 16 comments that mentioned about its disadvantages. They said that some online foreigners had inappropriate behaviors, some foreigners did not understand their learning purpose, there were some problems about computer devices and internet systems, and they got confused with the task design. All participants were free to write their thoughts and feelings about the English learning process in the diaries. There was no regulation or step required in the recording. It was obviously seen that participants in the experimental group gave positive comments about the program more than negative ones. Therefore, it could be concluded that participants in the experimental group felt more satisfied with the English learning environment provided by the MacroSIM program.

5.3 Pedagogical Implication

5.3.1 Heteronomous and Autonomous Behavior in Education

Piaget's purpose of education is about developing people on intellectual and moral autonomy and contradicts the purpose of traditional education which is referred to as 'transmit knowledge and values from one generation to the next' (Kamii, 1984). Autonomy contrasts with heteronomy and Piaget described it like the beginning stages of a child's development which is 'characterized by a strict adherence to rules and duties, and obedience to authority' (Kamii, 1984). In his sense heteronomy means one is controlled by someone else so his theory of developing autonomy in children is about trying to prevent children to think and act heteronomously. He suggested that rewards and punishments should not be used as they reinforce heteronomous rather than autonomous behavior. Instead, coordination of viewpoints with other adults or their peers could help children construct rules of conduct by themselves (Kamii, 1984). It is similar to the results of Sugata Mitra's experiment as he concluded that '6 – 13 years old children are able to self-instruct and teach their peers without intervention from adults' (Mitra, 2007; Iamdar and Kulkarni, 2007; Farris, 2013). This also happened in the MacroSIM project as the role of the teacher was diminished. Most of the time, the participants in the experimental group did their tasks independently. The qualitative results also identified that they consulted with their friends (17

comments) more often than the teacher (2 comments).

The results of this study make a clear picture that a degree of learning autonomy could be improved by reducing roles of the teacher which mean that students have more opportunities to rely upon themselves. The program, MacroSIM, was designed specifically to develop learners' autonomy and it helps the developing process of language learning of the experimental group significantly. In pedagogical aspects children should be taught to be active learners who are responsible for their own learning. They should not only sit passively receiving information from a teacher. They are the ones who actively make sense of things that they are learning. Therefore, English pedagogy in the Thai education system should be reformed to focus more on learning paradigm by steering away from traditional teaching style. Here are some suggestions for reducing heteronomous behaviors and increasing a degree of autonomy in learning.

1) Teachers should reduce time giving lectures to have discussions. This approach promotes critical thinking and it helps to develop understanding through two-way communication.

2) Teachers should emphasize more on using knowledge instead of remembering content because learning is a continuous process. The more learners practice the more they understand.

3) Learners should have more time for thinking, pondering, and planning

before practicing. This step is important to the learning process because it increases self-confidence. When learners are forced to do things that they are not ready to do; they may be stressed and it could stop the process of learning.

4) Evaluations should be used constructive and focus on improvement not to punish as Piaget mentioned, rewards and punishments could have negative effects on learning autonomy.

5) Learners should be promoted a sense of cooperation by reducing the importance of grading and testing systems. Cooperative learning environments have advantages to productivity improvement.

6) Learners should have a freedom to think and make decisions on their own actions as it increases their sense of responsibility for their own learning. Otherwise they could not understand how to improve their actions to be better.

5.3.2 Application of Constructivist Learning Environment Enhancing Language Learning

The results of this study attribute to language pedagogy in terms of how to manage language learning environment for English learners in tertiary levels by using technology. The effectiveness of MacroSIM program is supported by empirical evidences of developed language skills from the experimental group. The results of this study show that participants' English skills were more complex and communicative. They could apply many language strategies to be able to

communicate their meanings effectively. Their senses of using English were more natural and appropriate for the service business. They were more aware of their own use of English and also that of the others. They were mindful and knew how to prepare themselves to be able to use the language properly. These outputs result from the notions constructivist concept for managing environments suited to the learning process.

MacroSIM structures are quite simple and easy to implement yet it yields outstanding outcomes which are contrasting with the traditional teaching approach. MacroSIM program provides rich authentic learning resources without limitations of time and space. Learners are able to make a sense of the target language authentically at the level of their proficiency. It is consistent to child-centered approach as each learner can develop English skills from one's own understanding individually. All these occur without involvement from a teacher and a textbook which means a lot to English education in Thailand regarding educational budgets. With the advancement of technology, it is possible and practical to implement MacroSIM-like English lessons at a very low cost. With nothing new to invest, the program is applicable with equipments and facilities that are available in all schools and universities today. The model of the MacroSIM program is not only economical but also efficient in terms of responsiveness to individual learning. It means that this model could be applied with any type of

English education (i.e. informal, formal, and non-formal education).

5.3.3 Characteristics of Developed Language Proficiency

It could be noticed that developed English skill of the participants from both the experimental and control groups went far beyond these four language criteria. They were set as language objectives to investigate participants' development of English before the experiment was conducted. Even though they were based on a review of related studies, these language criteria were subjectively determined by others. The qualitative analysis found seven emerging language patterns which means that the language proficiency of both groups had progressed further than the objective language criteria. Also, some participants of the experimental group demonstrated their imagination and creativity in their posttest responses. That means some parts of their progressive language proficiency were unable to be predicted. This result is consistent with the philosophical concept of unpredictability of a process as stated by Henry E. Kyburg Jr. 'our body of knowledge, which will somehow reflect what we know and what we don't know' (Kyburg, 1974). Observing things that fit pre-determined objectives is only a one-sided view of the wholeness as there is always something that does not behave according to the laws. This is called probability in science as Arthur M. Young mentioned in his interview (ThinkingAllowedTV, 2010). In terms of understanding the effectiveness of how MacroSIM affects the ability of the use of English of all

participants should be examined as a whole; not only the parts that fit those preset goals. Arthur M. Young (1976) suggested that ‘the parts are derived from the whole, and not the whole from the parts’. He also explained that ‘Because the whole cannot function when divided’ (Young, 1976). In other words, the whole exists before the parts and it means the whole is more important than the parts. Therefore, developed language proficiency should be assessed as a whole; and its results should be characterized as predictable and unpredictable outcomes.

5.4 Limitations of the Study

5.4.1 Limitations of the Study

1. The sample of this study consisted of undergraduate students from a university in Nakhon Ratchasima province, Thailand. Their English knowledge was derived from the Thai education system of compulsory education until high school level. Currently, they were at the third year of undergraduate studying in the Business English curriculum at Nakhon Ratchasima Rajabhat University. Therefore, their English proficiency may not be representative of that of students of other countries, curricula or levels.

2. The data was collected with several research instruments as the researcher aimed to have multiple views of the study. However, the duration of the experiment was only 10 weeks of three 50-minutes periods. Therefore, the duration

of the implementation was restrictive to the data collection. A replication study with a longer period of time is suggested for further research.

3. The implementation was designed to encourage the participants to use English skill to simulate in four roles related to the restaurant business in a virtual world. Thus, there were three main rules of English use in this study. Firstly, those four roles: customer, waiter or waitress, chef, and manager, required all participants to do the simulation for one hour each. Therefore, the study results may not be generalized to the use of English in other fields. Secondly, this present study was conducted in a virtual world (IMVU) which required language use in text chat based from or computer-mediated communications (CMC). Therefore, the findings of this study may not be representative of other skills of English knowledge. Finally, this study focused on the notion of learning autonomy to study language learning process of English learners who were in a Thai context. Therefore, the results of the English learning process of these autonomous language learners may not be applicable to other projects that have different learning contexts.

5.4.2 Recommendations for Future Research

The current study aimed to investigate how autonomous language learners developed English knowledge through participating in a virtual world with macrosimulation teaching approach. Its results are limited as described above but there are some interesting aspects that should be considered for researchers in the

future. There are three recommendations for future research provided below.

1) This research used an experimental design with the experimental and control groups. The main research instrument used for collecting data of English proficiency was the DCT pretest and posttest. It would be interesting if further studies could apply more research instruments to examine differences of English proficiency in other aspects such as listening or reading skills.

2) The qualitative findings from this study suggest that participants in the experimental group felt enthusiastic, relaxed and able to make good progress, especially in the area of fluency. Replication studies could examine the reliability of these outcomes by applying similar course design principles in other contexts.

3) The findings of learning autonomy in this project revealed that participants in the experimental group perceived that they were more autonomous. It is really interesting to investigate how learners apply their sense of autonomy in other aspects.

In conclusion, this chapter presents the overall picture of the study with a summary of the results. Its limitations and recommendations are provided for future researchers who might be interested to apply technology for enhancing language learning in a service business context. Also, the recommendations of pedagogical implications might be useful for future researchers who would like to accelerate degrees of learning autonomy of their English learners. This project

attempted to apply the notions of postmodernism and constructivism into teaching practices. The results of this study were contributed to English pedagogy in Thailand.





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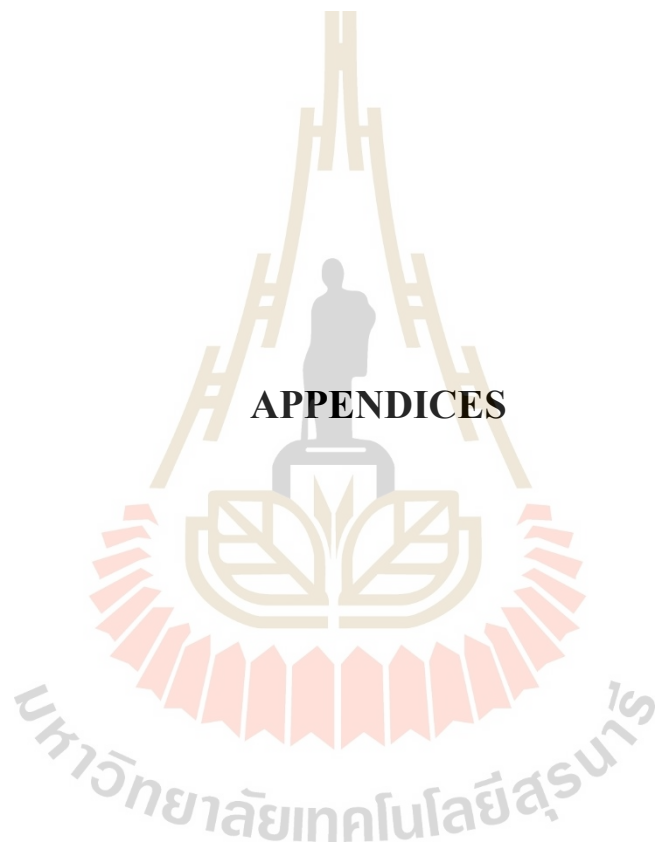
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APPENDICES

APPENDIX A
PRETEST AND POSTTEST

Discourse Completion Task (DCT) Assessment

Instruction: Read the following situations and write your responses in the blanks.

Situation 1:

You are a customer who is sitting in a pizza shop. After you finish having your meal and you want the waiter to bring you the bill.

You say:

Situation 2:

You are a customer who is sitting in a nice restaurant. A waiter suggests that today's special dish is 'Roasted lamb with baked squash'. You disagree with his offer.

You say:

Situation 3:

You are a customer in a café. You ordered a drink at a restaurant. When the waitress brings you the drink, she spills it all over your new dress.

Waitress: Oh, I'm really sorry about that!

You say:

Situation 4:

You are a waiter/waitress in a restaurant. A customer says that the fork is not clean.

You say:

Situation 5:

You are a waiter/waitress in an expensive restaurant. A woman calls you and says.

Customer: Could you please tell the chef that the soup is a little bit salty?

Is it possible to change it?

You say:

Situation 6:

You are a chef at a restaurant. A customer compliments your cooking after dinner.

Customer: Your food is so delicious. You're a fantastic chef!

You say:

Situation 7:

You are an owner of a café who is looking for a part-time waiter/waitress. There is a girl calls for applying in that position.

A girl: Hello. I'm interested to apply for the position of part-time waitress.

You say:

Situation 8:

You are a restaurant manager in a nice hotel. A customer has been smoking at his table which is against the restaurant's rules. You need to tell him.

You say:

APPENDIX B

Learning Autonomy Questionnaire

Please rate (✓) these following items according to your opinions.

Question	Response				
	Not at all				Very much
1. You can analyze/define your own learning needs.	1	2	3	4	5
2. You can set achievable learning objectives.	1	2	3	4	5
3. You can manage your time for your own learning process.	1	2	3	4	5
4. You can choose your own learning materials.	1	2	3	4	5
5. You can negotiate your own learning process.	1	2	3	4	5
6. You can select your own partners for pair/group work.	1	2	3	4	5
7. You can work on your own.	1	2	3	4	5
8. You can make choices about how work will be assessed.	1	2	3	4	5
9. You can assess discrete aspects of your own work.	1	2	3	4	5
10. You can assess the work of peers.	1	2	3	4	5
11. You can take responsibility for your own learning outside the classroom.	1	2	3	4	5
12. You can monitor your own learning progress over time.	1	2	3	4	5

APPENDIX C

Learning Autonomy Questionnaire (Thai Version)

แบบสอบถามการเรียนรู้อย่างอิสระ

กรุณาตอบแบบสอบถามตามความคิดเห็นของคุณ

คำถาม	คำตอบ				
	ไม่เลย				อย่างมาก
1. คุณสามารถวิเคราะห์หรือระบุเรื่องความจำเป็นของการเรียนรู้ (Learning needs) ของตนเองได้	1	2	3	4	5
2. คุณสามารถกำหนดวัตถุประสงค์ของการเรียนรู้ของตนเองได้	1	2	3	4	5
3. คุณสามารถจัดการเวลาเพื่อกระบวนการเรียนรู้ของตนเองได้	1	2	3	4	5
4. คุณสามารถเลือกสื่อการเรียนรู้เพื่อการเรียนรู้ของตนเองได้	1	2	3	4	5
5. คุณสามารถปรับเปลี่ยนกระบวนการ/วิธีการเรียนรู้ของตนเองได้	1	2	3	4	5
6. คุณสามารถเลือกหรือจับกลุ่มกับเพื่อนเพื่อทำงานได้ด้วยตัวเอง	1	2	3	4	5
7. คุณสามารถเรียนรู้ได้ด้วยตัวของคุณเอง	1	2	3	4	5
8. คุณสามารถเลือกได้ว่าจะให้มีประเมินผลงานของคุณอย่างไร	1	2	3	4	5
9. คุณสามารถประเมินผลงานของคุณได้เอง	1	2	3	4	5
10. คุณสามารถประเมินผลงานของเพื่อนได้	1	2	3	4	5
11. คุณสามารถรับผิดชอบต่อการเรียนรู้ในห้องเรียนของตนเองได้	1	2	3	4	5
12. คุณสามารถควบคุมความก้าวหน้าของการเรียนรู้ของตนเองได้ตลอดเวลา	1	2	3	4	5

APPENDIX D

IOC Form of Learning Autonomy Questionnaire for experts

Please rate (✓) these following items according to your opinions.

+1 = Appropriate 0 = Uncertain -1 = Inappropriate

Items	+1	0	-1	Comments
1. You can analyze/define your own learning needs.				
2. You can set achievable learning objectives.				
3. You can manage your time for your own learning process.				
4. You can choose your own learning materials.				
5. You can negotiate your own learning process.				
6. You can select your own partners for pair/group work.				
7. You can work on your own.				
8. You can make choices about how work will be assessed.				
9. You can assess discrete aspects of your own work.				
10. You can assess the work of peers.				
11. You can take responsibility for your own learning outside the classroom.				
12. You can monitor your own learning progress over time.				

APPENDIX E

IOC Analysis of Learning Autonomy Questionnaire

+1 = Appropriate 0 = Uncertain -1 = Inappropriate

Items	E1	E2	E3	IOC	Result of Analysis
Q1	+1	+1	+1	1	Acceptable
Q2	+1	+1	+1	1	Acceptable
Q3	+1	+1	+1	1	Acceptable
Q4	+1	+1	+1	1	Acceptable
Q5	+1	+1	+1	1	Acceptable
Q6	+1	+1	+1	1	Acceptable
Q7	+1	+1	+1	1	Acceptable
Q8	+1	+1	+1	1	Acceptable
Q9	+1	+1	+1	1	Acceptable
Q10	+1	+1	+1	1	Acceptable
Q11	+1	+1	+1	1	Acceptable
Q12	+1	+1	+1	1	Acceptable

Formula: $IOC = \frac{EX}{N}$

IOC Value = $\frac{1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0}{12}$

12

IOC = 1

Result: IOC Value was 1 and it was more than 0.5, therefore these questions were acceptable to be implemented with the participants.

APPENDIX F

Evaluation Questionnaire

Question	Response				
	Not at all	1	2	3	4
1. How much did you enjoy your experience with MacroSIM tasks?	1	2	3	4	5
2. How much are you exposed to English in the environment of MacroSIM tasks?	1	2	3	4	5
3. How successful were you in MacroSIM tasks?	1	2	3	4	5
4. To what extent were you able to control your learning process?	1	2	3	4	5
5. Did you experience freedom during your learning English with MacroSIM tasks?	1	2	3	4	5
6. How much has your English developed as a consequence of performing the MacroSIM tasks?	1	2	3	4	5
7. Did you feel uncomfortable during your learning of English with MacroSIM tasks?	1	2	3	4	5
8. Did you feel confused during your learning English with MacroSIM tasks?	1	2	3	4	5
9. Did you feel uncomfortable with the facility of computer lab?	1	2	3	4	5
10. Do you prefer MacroSIM tasks to a traditional approach for English learning?	1	2	3	4	5
11. Do you think that MacroSIM will be helpful for your English learning?	1	2	3	4	5
	Very easy				Very difficult
12. Did you find the assigned roles difficult?	1	2	3	4	5
13. Did you find IMVU virtual world difficult to use?	1	2	3	4	5
14. Did you feel uncomfortable during your English learning experience with MacroSIM, please indicate the reason.	Open response: Yes/No with reasons				

APPENDIX G

Evaluation Questionnaire (Thai Version)

แบบสอบถามการประเมินผลการใช้ MacroSIM

กรุณาตอบแบบสอบถามตามความคิดเห็นของคุณ

รายการพิจารณา	ไม่เลย				อย่าง มาก
1. คุณรู้สึกสนุกสนานแค่ไหนที่ได้รับประสบการณ์เรียนภาษาอังกฤษผ่านบทเรียนแมคโครซิม	1	2	3	4	5
2. คุณได้รับโอกาสได้ใช้ภาษาอังกฤษแค่ไหนจากบทเรียนแมคโครซิม	1	2	3	4	5
3. คุณประสบความสำเร็จแค่ไหนจากการเรียนภาษาอังกฤษผ่านบทเรียนแมคโครซิม	1	2	3	4	5
4. คุณสามารถควบคุมกระบวนการเรียนรู้ภาษาอังกฤษได้แค่ไหน	1	2	3	4	5
5. คุณมีอิสระแค่ไหนการเรียนภาษาอังกฤษผ่านบทเรียนแมคโครซิม	1	2	3	4	5
6. คุณพัฒนาภาษาอังกฤษได้แค่ไหนผ่านบทเรียนจากบทเรียนแมคโครซิม	1	2	3	4	5
7. คุณได้รับความไม่สะดวกในการเรียนภาษาอังกฤษจากบทเรียนแมคโครซิมบ้างไหม	1	2	3	4	5
8. คุณรู้สึกสับสนในการเรียนภาษาอังกฤษจากบทเรียนแมคโครซิมบ้างไหม	1	2	3	4	5
9. คุณรู้สึกไม่สะดวกในการใช้ห้องคอมพิวเตอร์บ้างไหม	1	2	3	4	5
10. คุณพึงพอใจกับบทเรียนแมคโครซิมมากกว่าการเรียนภาษาอังกฤษแบบดั้งเดิมแค่ไหน	1	2	3	4	5
11. คุณคิดว่าบทเรียนแมคโครซิมช่วยในการเรียนภาษาอังกฤษของคุณแค่ไหน	1	2	3	4	5

	ง่าย มาก				ยาก มาก
1. คุณรู้สึกว่ายานพาหนะที่มอบหมายยากแค่ไหน	1	2	3	4	5
2. คุณรู้สึกว่าการใช้โลกเสมือนจริงใน IMVU ยากแค่ไหน	1	2	3	4	5
3. คุณได้รับความไม่สะดวกระหว่างการเรียนรู้ ภาษาอังกฤษกับบทเรียนแมคโครซิมหรือไม่	(กรุณาให้เหตุผล)				



APPENDIX H

IOC Form of Evaluation Questionnaire for experts

Please rate (✓) these following items according to your opinions.

+1 = Appropriate 0 = Uncertain -1 = Inappropriate

Items	+1	0	-1	Comments
1) How much did you enjoy your experience with MacroSIM tasks?				
2) How much are you exposed to English in the environment of MacroSIM tasks?				
3) How successful were you in MacroSIM tasks?				
4) To what extent were you able to control your learning process?				
5) Did you experience freedom during your learning English with MacroSIM tasks?				
6) How much has your English developed as a consequence of performing the MacroSIM tasks?				
7) Did you feel uncomfortable during your learning of English with MacroSIM tasks?				
8) Did you feel confused during your learning English with MacroSIM tasks?				
9) Did you feel uncomfortable with the facility of computer lab?				
10) Do you prefer MacroSIM tasks to a traditional approach for English learning?				
11) Do you think that MacroSIM will be helpful for your English learning?				
12) Did you find the assigned roles difficult?				
13) Did you find IMVU virtual world difficult to use?				
14) Did you feel uncomfortable during your English learning experience with MacroSIM, please indicate the reason.				

APPENDIX I

IOC Analysis of Evaluation Questionnaire

Items	E1	E2	E3	E4	E5	IOC	Result of Analysis
Q1	+1	+1	+1	+1	+1	1.00	Acceptable
Q2	+1	+1	+1	+1	+1	1.00	Acceptable
Q3	+1	+1	+1	+1	+1	1.00	Acceptable
Q4	+1	+1	+1	+1	+1	1.00	Acceptable
Q5	+1	+1	+1	+1	+1	1.00	Acceptable
Q6	+1	+1	+1	+1	+1	1.00	Acceptable
Q7	+1	+1	+1	+1	+1	1.00	Acceptable
Q8	+1	+1	+1	+1	+1	1.00	Acceptable
Q9	+1	+1	+1	+1	+1	1.00	Acceptable
Q10	+1	+1	+1	+1	+1	1.00	Acceptable
Q11	+1	+1	+1	+1	+1	1.00	Acceptable
Q12	+1	+1	+1	+1	+1	1.00	Acceptable
Q13	+1	+1	+1	+1	+1	1.00	Acceptable
Q14	+1	+1	+1	+1	+1	1.00	Acceptable

Formula: $IOC = EX/N$

IOC Value = $\frac{1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0+1.0}{14}$

14

IOC = 1

Result: IOC Value was 1 and it was more than 0.5, therefore these questions were acceptable to be implemented with the participants.

APPENDIX J

Expert Rating Form

Expert Evaluation Form	Rating Scale					
Situation 1	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						
Situation 2	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						
Situation 3	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						
Situation 4	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						
Situation 5	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						
Situation 6	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						
Situation 7	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						
Situation 8	0	1	2	3	4	5
1) Task fulfillment						
2) Politeness and appropriacy						
3) Word choice						
4) Grammatical form						

APPENDIX K

Pretest and Posttest Results of the Experimental Group

Experimental Group	Pretest	Posttest	Difference
1	117.33	119.67	2.34
2	128	112	-16
3	121	120	-1
4	136.33	145.33	9
5	120.67	130.33	9.66
6	151.67	152.67	1
7	130	99.67	-30.33
8	125	123.67	-1.33
9	136	130	-6
10	113.67	119	5.33
11	126	129	3
12	134.67	123.67	-11
13	139	122	-17
14	124.33	131.33	7
15	123	124.33	1.33
16	134.67	128.33	-6.34
17	102	105.33	3.33
18	108.33	104	-4.33
19	136	125	-11
20	118.33	121.33	3
21	85.33	104.33	19
22	126	114.33	-11.67
23	115.33	114.33	-1
24	76	108	32
25	97	122.33	25.33
26	96.33	123.67	27.34
27	79.67	104	24.33
28	117	150.67	33.67
29	116.33	119.67	3.34
30	109.67	119.67	10
31	82.33	118.67	36.34
32	136	143.67	7.67
33	83.67	133	49.33
34	76.33	131.33	55
35	78.33	96.67	18.34
36	133.67	133	-0.67
37	116.67	126.33	9.66
38	129	147	18
39	119.33	113	-6.33
Median	119.33	122.33	3.00

APPENDIX L

Pretest and Posttest Results of the Control Group

Experimental Group	Pretest	Posttest	Difference
1	113	113.67	0.67
2	104.67	103.67	-1
3	102.67	108	5.33
4	135.33	129.33	-6
5	125	136.33	11.33
6	103.33	114	10.67
7	107.33	111.67	4.34
8	125	105	-20
9	113.67	119.33	5.66
10	124.33	129	4.67
11	108	108.33	0.33
12	108.33	119.33	11
13	102	103.67	1.67
14	115.33	108.33	-7
15	108.33	109.33	1
16	109.67	104	-5.67
17	108.33	123	14.67
18	102	105.33	3.33
19	102	103.67	1.67
20	101	108.67	7.67
21	107.67	109	1.33
22	115.33	124.33	9
23	103.67	108.33	4.66
Median	107.33	108.00	0.67

มหาวิทยาลัยเทคโนโลยีสุรนารี

APPENDIX M

Results of Learning Autonomy

Participant No.	Before	After	Difference
1	45	49	4
2	18	52	34
3	43	46	3
4	21	53	32
5	21	53	32
6	27	47	20
7	30	43	13
8	21	52	31
9	21	58	37
10	18	57	39
11	21	52	31
12	27	40	13
13	20	49	29
14	23	44	21
15	31	41	10
16	28	44	16
17	23	52	29
18	25	36	11
19	27	46	19
20	18	54	36
21	43	46	3
22	26	48	22
23	27	54	27
24	24	44	20
25	34	41	7
26	27	55	28
27	25	36	11
28	22	42	20
29	18	53	35
30	22	48	26
31	22	46	24
32	27	41	14
33	15	47	32
34	17	42	25
35	31	49	18
36	19	50	31
37	30	57	27
38	21	55	34
39	21	51	30
Total	979	1873	894
Average	25.10	48.03	22.92
S.D.	6.98	5.73	10.14
Highest	45	58	39
Lowest	15	36	3

APPENDIX N

Results of Program Evaluation

Participant No.	MacroSIM Evaluation
1	52
2	45
3	51
4	41
5	55
6	43
7	41
8	48
9	44
10	46
11	44
12	42
13	39
14	42
15	33
16	42
17	53
18	45
19	42
20	45
21	42
22	49
23	47
24	46
25	46
26	52
27	41
28	42
29	44
30	47
31	42
32	41
33	47
34	41
35	53
36	43
37	39
Total	1,755
Average	45.00
S.D.	4.67
Highest	55
Lowest	33

APPENDIX O

Samples of Student Diary

บันทึกครั้งที่ 2 : สัปดาห์ที่ 9

เพื่อเริ่มใช้ IMVU เป็นแล้ว ก็สัปดาห์นี้เพื่อเป็นข้อสำหรับส่วนบทบาท
เป็น waitress, customer, manager และ chef.

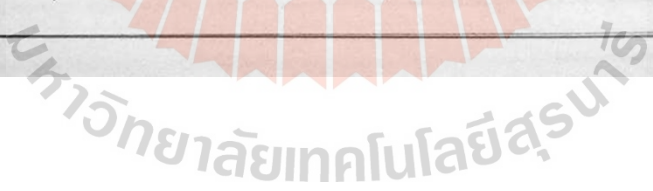
สัปดาห์นี้ได้ทบทวนก็ได้เริ่มทบทวนภาษาจากทุกข้อส่วนบทในบท
waitress และ customer ทดใช้ภาษาจากไวยากรณ์ grammar
บทที่ 1 ที่ 1-1000 ต่อมาคือไปทดลองบทเพลง
ได้อ่านบทเรียนจากวิชาภาษาอังกฤษเพื่อทบทวนบทเรียนที่ได้อ่าน
ซึ่งเป็นบทเรียนที่สามารถใช้ได้ในวันต่อไป

การเขียนในบทเรียนนี้คือคำ: อาหาร เป็นต้นเอง ส่วนงาน
ที่ให้นักเรียนทำเอง ก็เช่นทบทวน IMVU ก็เช่นบทเรียนที่ได้อ่าน
ส่วนงานที่ตนเองทำก็มีเช่นเช่น: งานที่ให้นักเรียนได้ทำเอง
ซึ่งโปรแกรมนี้คือ: เช่น: ได้ใช้ภาษาจากทุกข้อส่วนบทเรียนที่ได้อ่าน
ก็พยายามเต็มที่คือ: ส่วนงานที่ตนเองทำเอง ก็มีไป เช่นไปทบทวน
เช่น: ได้ฝึกฝนบทเรียนในการเขียนที่ตนเองได้ทำเอง ได้ทำส่วนที่ใหม่คือ:
ที่ตัวเองคิด อาหารที่มาก: ก็ทำสิ่งใหม่ในการเขียนที่ใช้ภาษา
ได้ใช้เช่นนี้:

แล้วจากที่ดิฉันไม่ได้ใช้งาน IMVU มาแล้วหลายปี ตอนนี้ดิฉัน
 คิดว่า ดิฉันมีพัฒนาการทางด้านภาษาอังกฤษมากขึ้น ดิฉันได้เรียนรู้คำศัพท์
 มากมาย ทั้ง การ แสดงบทบาท สวมชุด หน้าที่ Chef, waiter/waitress,
 customer, manager แต่ลักษณะการ ใช้ รูปของโปรดที่คนต่าง
 กันไป ทำให้ดิฉันได้ฝึกการใช้รูปของโปรดที่ต่าง
 แสดงอารมณ์ เช่น การใช้อาข IMVU ทำให้ได้พัฒนาการใช้ภาษาอังกฤษ
 ฝึกทำในขณะเล่นด้วย เพราะเล่นพร้อมกับการเล่นเกมส์ไปในตัว
 ดิฉันคิดว่าโปรแกรมนี้มีประโยชน์มากค่ะ เพราะการเล่นเกมส์ ก็ไม่ได้มีอะไร
 พิเศษ สามารถทำให้ได้รู้คำศัพท์ภาษาอังกฤษมากมาย เช่น ถ้าจบ ดอสไป
 ดิฉันคิดว่าใช้ภาษาโปรแกรมนี้ด้วย ดิฉันได้เผลอไปไหนในเน็ต ค่ะ ซึ่งก็เป็นอีกอย่าง
 ท่องไว้ที่ทำได้ได้เรียนรู้ ภาษาอังกฤษ ดิฉันคิดว่าเล่น การใช้ภาษาอังกฤษของ
 ๗๐ แล้วค่ะ ขอขอบคุณอาจารย์ที่แนะนำโปรแกรมนี้ๆ แบบนี้ใช้แล้ว
 โปรแกรม IMVU ช่วยฝึกพัฒนาได้มากทีเดียวค่ะ



ข้อจากเรื่องมาจากจะจบครอล ถ้าถามถึงความรู้สึกต่อคนแบบนี้หรือเปล่า?
 ถ้าให้พูดคืออิกรวมเวลาๆ คนๆจบ แต่ใส่แว่นดำก็ดูไม่ชอบอะไร เพราะ
 หนูชอบการใส่แว่นแบบเป็นกลศทุกๆอันนะ ให้ดูมีสติมากกว่า อายในใจออร์นอร์เร็น
 ถึงร้านอาหาร มีกระจกใสๆ กระจกประกอบทุกส่วนเหมือนจริง ทำให้บรรยากาศเหมือน
 เสด็จเยือนในหนึ่งงาน หน้ที่งานเสร็จๆมาดทันที กระจกนี้ด้วยตาตนเองนี่กระจกผลิตของ
 ตัวเองเงินสิ่งที่ทุกคนควรมีในชีวิตจริงอยู่แล้ว
 กระจกนี้ด้วยตาตนเองน่าจะคืออิเล็กทรอนิกส์ดี แต่ฉันลังจากที่ใต้เรื่บรูแล้ว
 ด้วงในผนังก็จะได้ดูกับเพื่อนในห้องแล้วมาดทันที เพราะชาวต่างชาติไว้เก็บใจใน
 ด้วงที่เขาทำอยู่ เราจะได้ดูกับพวกเขาในเรื่องอื่นมากกว่า ดังนั้น หนูก็เลยยังไม่เห็น
 กระจกของกระจกนี้วิชาสักเท่าไร
 แต่หนูต้องขอขอบคุณอาจารย์มากนะคะ สำหรับคำแนะนำ หรือกระจกที่
 ต่างๆ ที่ได้มอบให้ฉันนะ หนูจะพยายามทำความเข้าใจและนำไปปรับใช้ให้ได้มาก
 ที่สุด ขอขอบคุณค่ะ
 ป.ล. ทุกความฝัน อาจหมดความรู้สึกของหนู ไม่ได้ตั้งใจที่จะพูดไม่ได้เพราะ ะ



APPENDIX P

Implementation of MacroSIM in Classroom



CURRICULUM VITAE

Miss Kitisuda Parnkul was born in Nakhonratchasima, Thailand. She received a Bachelor of Education (English) from Rajabhat Institute Chandrakasem and a Master of Arts in English for Careers from Thammasat University. She is currently a Ph.D. student in English Language Studies at School of Foreign Languages, Institute of Social Technology, Suranaree University of Technology.

Kitisuda Parnkul works as a full-time lecturer for Business English program, Faculty of Humanities and Social Sciences, Nakhon Ratchasima Rajabhat University. She teaches several courses in ESP field such as English for Hotel, English for Secretary, English for Restaurant and Catering Services, and English for Marketing. Her research interests include learning process, learning autonomy, self-directed learning, and learning environments.

มหาวิทยาลัยเทคโนโลยีสุรนารี