

LEARNING BEYOND LANGUAGE: ENGLISH FOR SPECIFIC
PURPOSES (ESP) LEARNERS' EXPERIENCE
IN THE SECOND LIFE® WORLD

by

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A DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in the
Department of Educational Leadership,
Policy, and Technology Studies
in the Graduate School of
The University of Alabama

TUSCALOOSA, ALABAMA

2016

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ABSTRACT

The purpose of the study was to explore and describe the instructional potential and implication of using Second Life® (SL) world to teach content-based English to English for specific purposes (ESP) learners while enabling them to achieve their specific professional, educational, or personal goals simultaneously. This research study followed a qualitative research design: a descriptive case study that included observation and analysis of the teaching and learning activity between one native-English speaking instructor from the U.S. and 16 non-native English speaking undergraduate students from China, who majored in aviation-related programs, to seek for their actual experiences and perceptions of learning English for their specific purposes, in a pre-designed, aviation communication-themed SL course.

The findings of the study revealed that, as novice SL users, learner participants held consistently positive attitudes toward learning English for their specific purposes in the pre-designed virtual learning environment (VLE) of SL, due to their specific purposes as the practical motivations. Their self-efficacy was engaged and enhanced by their active participations in the learning process that SL afforded. The learner participants autonomously utilized available resources and interacted and collaborated with instructor and peers to gain incomparable learning experiences than what they used to do in the traditional classroom. Several instructional affordances that SL offers for ESP learning were identified and discussed. With inevitable limitations identified in the study, the researcher provided recommendations for ESP learners, instructors, and instructional designers, as well as for future research between SL and ESP education.

DEDICATION

This dissertation is dedicated to my utterly loved parents, my dad Jiannan and mum Lijun. In their eyes, I am the perfect SON. Thank you for making me a better MAN! For uncountable reasons, I am forever indebted to my mum; it is just her who lets me understand the true meaning of *Das Ewig-Weibliche Zieht uns hinan*.

天道酬勤

(DII FACIENTES ADIUVANT)

ACKNOWLEDGMENTS

First and foremost, I sincerely appreciate my dissertation committee: Drs. Angela Benson (Chair), Vivian Wright (Advisor), Margaret Rice, André Denham, and Dilin Liu. It would never have come to a completed dissertation without their ardent guidance, practical suggestions, and invaluable advice throughout my entire dissertation journey. I also thank all other professors who have taught me here at The University of Alabama; their insightful knowledge and incomparable expertise in multiple fields have inspired me profoundly. *Ancora imparo.* The *Capstone Creed* will continue shedding light on my path of seeking truth, knowledge, hope, love, and faith, for the rest of my life. *Nosce te ipsum.*

I am indebted to those who cordially assisted and participated in my study: Prof. Y, who helped me with learner participant recruitment; Mr. P, who devoted himself instructing the Second Life course; and those talented learner participants, who passionately and energetically participated in the study. All your kind understanding, precious time, and wholehearted cooperation are greatly appreciated. I wish you all could benefit from my study. *Non scholae, sed vitae discimus.*

I shall thank the Second Life community: Mr. Philip Rosedale, the founder of Linden Lab and the creator of Second Life, who has brought us this amazing and breathtaking virtual world; Second Life online support, who helped clarify my research inquiry; and those creative and intelligent creators/owners/residents of the Second Life wonders, who unselfishly privileged me and my participants to access and conduct study on their properties, hence I did not have to make my own wonderland, which was life-saving for me! I am also thankful for the staff from UA's

IRB office, who assisted and approved my study protocol in a timely manner; Dr. Rebecca Ballard, who served as my editor to finalize this manuscript; and administrator from Grad School, who reviewed and approved the final version of the manuscript for ProQuest ETD submission.

Thanks y'all, *ab imo pectore!*

Specially, I am grateful to Dr. Shaorong Huang and his loving family, for their consistent support while I was pursuing my master's and doctorate in the U.S.; and Dr. Yingqin Liu and Dr. William Carney, for their tireless proofreading, editing, and valuable suggestions and advices for my dissertation. *Amicitiae nostrae memoriam spero sempiternam fore.*

I extend the utmost gratitude to all my loyal friends and warm-hearted strangers that I have met in the U.S. for their unselfish love, unconditional support, and unbiased criticism, both physically and spiritually. Life has become more meaningful and retrospective when you are blessed to encounter those who really love and care about you, and who are willing to grow with you. *Quam bene vivas refert, non quam diu.*

Last but not least, may the googolplexian transcontinental and interstellar XOXO and love converge to my Ms. Right, “uxorious” is my nickname to you, from the day we met, till now, and forever. *Nunc scio quid sit amor.*

CARPE DIEM, CON RESPICIO & DULCIS DOMUS ALABAMA, RTR!

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CHAPTER I:

INTRODUCTION

Introduction

Using Second Life (SL) to teach English as a foreign or second language (EFL/ESL) is not new. According to Team Engage (2009), Joe Miller, the Vice President of Platform and Technology Development from Linden Lab (owner and creator of SL) once suggested that “language learning is the most common education-based activity in Second Life.” Erard (2007) noted that courses in multiple languages (at various levels) have been offered in SL, such as English, Japanese, and Spanish. SL is considered a type of virtual world (VW) that “allows user to interact with a computer generated three-dimensional model or virtual environment” (Christou, 2010, p. 237). The Association of Virtual Worlds (2009) provides a list of more than 300 virtual reality applications and platforms (including SL) that are designed as multi-user virtual environments (MUVEs) in which a user’s individual computer (as an end-user terminal) is connected with the VW through a network. Due to this unique feature, SL has been widely used in various educational settings for accomplishing almost every educational or academic and professional goal that used to be achieved only via traditional in-class activities. It enables its users (learners and instructors) to communicate and collaborate on the same project or subject within a synchronously interactive platform without time and location constraints. Since its debut in 2003, SL has developed rapidly and promoted its educational potential.

Unlike other similar VWs, SL has several prominent advantages that make it worth researching and developing for educational purposes. Kingsley and Wankel (2009) have

suggested that SL is the “most popular platform for educators” (p. 3) because it is “not a game” (p. 3); it is free for everyone; it “has real economy, using ‘Linden Dollars’” (p. 3) so it can be used for business education; it is an ““open society”” (p. 3); it has “a strong community of developers and programmers who are working to simplify the interface on the one hand while enabling a higher degree of integration with other platforms and programmes on the other” (p. 4); and it “will provide an excellent foundation upon which to build the competencies required to develop educational programmes in any other VW” (p. 4). According to Ruberg (2008), in as little as five years from its launch, SL has attracted more than 5,000 language learners of multiple languages who have been taught by about 1,000 language instructors worldwide. Specific to EFL/ESL education, SL has demonstrated some advantages, as Hislope (2008) has claimed, namely, that SL is “an excellent potential resource for supplementing English language classes” (p. 56). Although a considerable number of English courses and programs have been offered in SL, Reyes and Vallone (2009) pointed out that the shortage of qualified SL-based English teachers and resources has become an urgent issue that demands attention from both researchers and practitioners of English education (p. vii).

Statement of the Problem

Cook (2001) has emphasized the “internationalism” (p. 164) of English; it is still the most widely used global language, as compared to other international languages like Mandarin Chinese (not widely spoken), French, and Arabic that are also being used for international interpersonal communication. Therefore, a rising demand for learning English for various pragmatic purposes has become the primary motive and rationale for people from non-English speaking countries and regions. However, due to geographical boundaries and economic imbalance, non-English speakers from under-developed and developing countries are isolated

from qualified language instructors and authentic learning resources that are mostly available and abundant in highly developed, English speaking countries (Reyes & Vallone, 2008). Ragan and Jones (2012) have pointed out that parents from some developing countries such as Brazil, China, India, and Turkey have already realized that English competency is incomparable and essential for their children, which would ensure them better careers and promising futures, therefore, English competency has become an increasingly valuable asset. Non-English speakers' opportunities for communicating and interacting in English with English-native speakers, in a relatively authentic environment, would ensure and increase their competency in utilizing the language in a more personal, practical and specific manner.

Traditional in-class EFL/ESL education in non-English speaking countries has long been criticized for several deficiencies, including low effectiveness and efficiency, boredom and anxiety, and impracticality. Table 1 provides the teachers' and learners' perspectives regarding each deficiency.

Table 1

Deficiencies of Traditional EFL/ESL Education

Deficiencies of traditional EFL/ESL education	From non-native English speaking teachers' perspectives	From EFL/ESL learners' perspectives
Low Effectiveness and Efficiency	Inadequate language proficiency for English teaching (Ma, 2012)	Prefer native English teachers over non-native English teachers (Walkinshaw & Duong, 2012)
	Lack of authentic teaching resources (Guo, 2012)	Lack of authentic learning resources (Guo, 2012)
	Lack of authentic teaching environment (Wu & Wu, 2008)	Lack of authentic learning environment (Wu, 2009; Yang, 2010)
Boredom and Anxiety	Lack of interaction/ communication with students (Ma, 2012)	Lack of interaction/ communication with teacher and among peers due to learners' negative attitudes toward learning (Maftoon & Ziafar, 2013)
	Teacher-centered classroom (Nagaraju, Madhavaiah, & Peter, 2013; Zohrabi, Torabi, & Baybourdiani, 2012)	Lack of learner autonomy (Ming, 2009)
Impracticality	Lack of specific and practical teaching objectives (Nawab, 2012)	Lack of specific and practical learning purposes/motivations (Bahous, Bacha, & Nabhani, 2011; Gardner, Masgoret, Tennant, & Mihic, 2004)
	Disassociation between in-class teaching and extension to students' real life experiences (Pegrum, 2000)	Disassociation between in-class learning and extension to their real life experiences (Pegrum, 2000)

Ho (2006) attributed these criticisms to the fact that in “teacher-centered classrooms” (p. 7) with “minimal student participation” (p. 7), “students remain orally incompetent despite being structurally knowledgeable in the second language” (p. 7). A traditional EFL/ESL classroom

cannot satisfy the high demand for learning English practically and effectively (Sarica & Cavus, 2009). Therefore, teachers have “a desire for teaching environments where a lot more attention is paid to active and engaging teacher-student and student-student interactive behavior” (p. 8). In search of a solution that is beyond the limitation of the rigid formation of the stereotypical teacher-centered classroom, language researchers and practitioners “have always been ahead of the curve in integrating technology in FL (foreign language) instruction” (Belmekki, 2013, p. 273). They tend to see “the benefits of technology even without an extant research database to confirm their judgment” (p. 273). Sarica and Cavus (2009) noted that among all existing languages, “English has become as an ideal language for expression of feelings and using the technology” (p. 439) and this is because “English is the only valid language that can be understood by everyone all around the world” (p. 439).

As one of the prominent instructional technologies, SL has demonstrated a great potential in EFL/ESL education that can be seen in studies and practice (Peterson, 2011; Peterson, 2012; Stevens, 2006; Vickers, 2007; Wang, Lefaiver, Wang, & Hunt, 2011; Wang, Song, Xia, & Yan, 2009). However, these and other studies (see Chapter II) are limited in only exploring and discussing the purely linguistic aspect of English education that SL engages. Rarely have researchers studied the integration of English linguistic skills to help EFL/ESL learners achieve their pragmatic and specific purposes other than simply acquiring the language itself. Dudley-Evans (2001) emphasized that “the demand for English for specific purpose continues to increase and expand throughout the world” (p. 115). This study bridges the gap between what SL has done for general English and where it might be better utilized in English for specific purposes (ESP) education.

Theoretical Framework

The theoretical framework that was reflected throughout the research is a constructivist approach to virtual learning. Constructivist theory considers learning as an act of understanding the principles, concepts, and facts from subject world (Jonassen, Peck, & Wilson, 1999). It is believed by the proponents of constructivism that as an educational philosophy, constructivism is quite distinct from objectivist views (e.g., cognitivism and behaviorism) that knowledge and truth exist independently of the learners, and the learning goals are to absorb the external knowledge by passive transmission or active intake (Perkins, 1991). On the contrary, constructivism claims that knowledge and truth are not acknowledged universally: the individual learner has his or her own criteria for defining knowledge and truth. The instructor's role is not only to infuse learners with knowledge but also provide the appropriate learning conditions or environment based on their particular situations (Bednar, Cunningham, Duffy, & Perry, 1992). Driscoll (2000) identified the origin of the constructivist view of learning, thusly:

Constructivism has multiple roots in the psychology and philosophy, among which are cognitive and developmental perspectives of Piaget, the interaction and cultural emphases of Vygotsky and Bruner, the contextual nature of learning, the active learning of Dewey, the epistemological discussions of von Glaserfeld, postmodernist views, and the paradigm and scientific revolutions of Thomas Kuhn. (p. 375)

Woolfolk (1993) concisely described the learning process according to the constructive approach by noting, “students actively construct their own knowledge: the mind of the student mediates input from the outside world to determine what the student will learn. Learning is active mental work, not passive reception of teaching” (p. 485). Similarly, Dickey (2005) stated, “Within the constructivist paradigm, learning is not viewed as the transmission of ideas, facts, and theories, but rather learning is considered a process of constructing” (p. 449). Constructivist learning creates “activities that allow learners to create, problem-solve, make decisions, and

reflect enhance engagement and learning” (p. 449). Both Woolfolk’s and Dickey’s statements about constructivist learning emphasize and place at theirs centers the significance of learner autonomy.

SL reflects the major characteristics of the constructivist approach in the learning process, such as learner autonomy, collaboration, interpersonal communication, knowledge construction, and authentic learning (Driver, 1988). These characteristics are also recognized by several researchers (Greening, 1998; Hernandez-Serrano & Choi, 2000; Inman, Wright, & Hartman, 2010; Neely, Bowers, & Ragas, 2010) and many confirm that SL an educational technologies that immensely supports constructive virtual learning.

Statement of Purpose

The purpose of the study was to explore and describe the instructional potential and implication of using SL to teach English to ESP learners while enabling them to simultaneously achieve their specific educational/academic, personal, or professional goals. Data were collected from undergraduate level, non-native English speakers at one higher institution in Mainland China to explore their perceptions, activities, and potential advantages and deficiencies of learning English in the virtual learning environment (VLE) of SL. The researcher also discovered several instructional affordances that contributed to ESP learning in such a VLE. The overall goal of this study was to provide applicable references and recommendations for ESP researchers/practitioners who aim to use SL to teach English for specific purposes beyond the constraints and deficiencies often found in the traditional classrooms of non-native English speaking countries or regions like China and Asia.

Significance of the Problem

Jon Huntsman (2011), former Utah governor and the first U.S. ambassador to China under Obama's presidency once claimed that China has become the largest English-speaking country in the world, although its official and daily communicative language still remains Mandarin Chinese. English learners in China have surpassed the total number of English speakers in the U.S., at approximately 300 million and counting (Johnson, 2011). However, due to the social complexity, economic bipolarization, and cultural diversity, not every non-English speaker has an equal opportunity to be educated in an authentic language environment. China has adopted an English education policy at all educational levels since the issuance of the *Open Door* policy in 1979. English is taught as an independent course with basic vocabulary and grammar in bilingual (English and Mandarin Chinese) instruction, from kindergarteners through undergraduate level. As an integral part of the policy in compulsory education, English learning in China is predominately exam-oriented. Students learn English as a subject and cram and memorize as much vocabulary and grammatical rules as possible just to ensure getting high grades on various English exams (e.g., National College Entrance Exam-English Section, College English Test Band 4 and Band 6, and Test of English Major Band 4 and Band 8, etc.). Rarely, however, have the students fully utilized English as a communicative and personal facilitator for everyday life and work. The effort and money invested in English education have comprised a huge proportion of the entire education expenditure in present-day China, while the learning outcomes have repeatedly embarrassed and disappointed learners, their parents, and English education practitioners and researchers. Mao and Min (2004) coined the terms *mute English* (p. 327) and *deaf English* (p. 327) to address those Chinese EFL learners who have learned English for a considerable period of time but are still unable to communicate in English.

with the basic skills of speaking and listening. What is worse is that the overemphasis on grammatical rote learning and linguistic acquisition has led Chinese English learners to an awkward situation in that what they speak is termed *Chinglish* (Jia, Li, & Hemphill, 2010, p. 566), the pidgin of Chinese and English that cannot be fully understood by English native speakers. Fang (2013) noted that English education is still a priority in China's education from K-12 to higher education. All of these dilemmas are primarily attributed to the fact that EFL/ESL learners have always been isolated from authentic learning environments and taught in a traditional classroom by less qualified instructors who are mostly non-English native speakers (Häcker, 2008). Consistent exposure and immersion in an authentic and natural learning environment of the target language is critical to effectively develop learners' language competency (Benson, 2001).

Research Questions

The study attempted to answer three research questions:

1. What are learner participants' attitudes toward and motivations for learning ESP in SL;
2. In comparison to in-class learning, what are learner participants' experiences of learning ESP in SL; and
3. What do learner participants consider to be the affordances of SL for ESP learning?

Due to the scarcity of the existing literature that addresses the issue the researcher aimed to explore, the study was mostly suitable as a case study design: an intensive description and analysis of a studied phenomenon, social factor, or system bounded by time or space (Berg,

2004; Creswell, 2012; Merriam, 1998). According to Merriam (1998), the rationale for designing for a case study, is as follows:

A case study design is employed to gain an in-depth understanding of the situation and meaning for those involved. The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation. Insights gleaned from case studies can directly influence policy, practice, and future research. (p. 19)

The study fit Merriam's criteria as it sought to better understand how SL could be utilized as an instructional venue for ESP learners to achieve specific learning goals, since little has been done to address this issue. The research findings could potentially inform future policy, practice, and research on ESP education in VLEs such as SL. Specifically, a descriptive type of case study was used as it documents the procedures of a particular event that must be explained, described, illustrated, or explored in order to have an in-depth understanding of such phenomenon (Yin, 2009). Stenhouse (1988) has explained that the advantage of this approach is that it can "enrich the thinking and discourse of educators either by the development of educational theory or by the refinement of prudence through the systematic and reflective documentation of experience" (p. 50).

Methods

In order to answer the proposed research questions, a case study was conducted entirely in the pre-configured VLE of SL. The primary research site was a virtual classroom identified and modified by the researcher in which an aviation-related ESP course was taught by an English native speaker (as the instructor participant) in such virtual classroom and related artifacts and facilities. Learner participants were 16 college undergraduate students recruited from Mainland China, who majored in aviation-related programs. Data sources included learner participants' pre-study surveys, in-world observations, and post-study interviews, as well as any documents

generated by the participants. The researcher used qualitative content analysis (Bernard, 2000) method to analyze the data.

Assumptions of the Study

The first assumption was that those who agreed to participate (see Appendix A for SL's policy on participant recruitment for SL in-world study) and signed the informed consent for the study were expected to be actively involved in the study by truthfully reflecting, demonstrating and sharing their honest, actual, prompt, and consistent attitudes, reactions, and feedback. Secondly, all participants should be computer literate and owned (or had access to) personal computers that met the minimum system requirements (see Appendix B). Last, it was expected that learner participants were able to dedicate quality in-world time for the study.

Limitations of the Study

There were several limitations identified from the study. First, the study only focused on SL as the virtual learning environment for EFL/ESL learning. Therefore, it is not suitable to generalize the findings with other existing and/or potential virtual environments or any languages other than English.

The second limitation was the selection of participants (see Limitations in Chapter III). Due to the nature of the setting and the researcher's credentials and specific inquiry toward the study, the sample size was purposefully chosen and limited within one institution. As Malterud (2001) suggested, "the findings from a qualitative study are not thought of as facts that are applicable to the population at large, but rather as descriptions, notions, or theories applicable within a specified setting" (p. 486). Therefore, generalizability was not the primary purpose of this study.

Third, unlike in-class, face-to-face instruction, teaching and learning in virtual environments feature less control and monitoring from the instructor but more self-discipline from the learners. Therefore, it was possible that the researcher was not able to pay enough attention to every detail and activity that occurred during the observed sessions, and the data collection and analysis of the learners' actual performances were somehow affected. Moreover, since all data were analyzed by the researcher alone, the understanding and interpretation of the data might be affected by his subjectivity. The researcher applied several qualitative strategies to minimize these negative factors (see Instrumentation and Data Collection in Chapter III).

Last, the selection of aviation-related topics as the subject matter for the study was based on the considerations of researcher's interests, instructor's credential, and potential participants' educational background and professional development. Hence, the study findings might not be fully applicable to other subjects or disciplines.

Operational Definition of Terms

There are several terms (some are frequently mentioned as their abbreviations) being used throughout the study:

Avatar. Specifically defined for this study, an avatar is an individual SL viewer's (user) on-screen persona that can be personalized by viewer in either real-life simulated (e.g., same or similar figure of oneself in reality) or creative (e.g., imaginary, exaggerating, or surreal appearance that represents one's presence in SL) ways. Gerhard, Moore, and Hobbs (2004) described the avatar as "user embodiment" (p. 5) to highlight its primary function of representing and identifying the individual user in a virtual world.

Content-Based Instruction (CBI). Also called *content-based language instruction*, according to Krahne (1987), "it is the teaching of content or information in the language being

learned with little or no direct or explicit effort to teach the language itself separately from the content being taught” (p. 65). In simpler words, learners who are under such instruction learn language simultaneously with the content knowledge such language carries.

Content knowledge instructor (CKI). In English content-based instruction, a CKI is the content knowledge expert who specializes in that particular field of knowledge and expertise, and usually has experience teaching in English to either native or non-native English speaking students (e.g., computer science lecturer, professor of business administration, certified flight instructor, etc.). Ideally, such an instructor should be a native English speaker.

Content knowledge. It is the specific knowledge, skills, and experience that second or foreign language learners learn and master when acquiring the target languages. It usually involves a particular discipline other than the target language itself, including for instance, computer programming, accounting, and aviation English.

EFL (English as Foreign Language) Learners. This term refers to non-native English speakers who learn English as a foreign language (compared to their native languages) for interlingual communication purposes within in their home country (usually non-English speaking).

ESL (English as Second Language) Learners. This term refers to non-native English speakers who learn English as a second language (in supplement to their mother tongues) in either non-English speaking (English is one of the official languages or English is not the official language but widely used, e.g., Philippines and Malaysia.) or English-speaking (English is the official or mostly used language, as in the UK and the U.S.A.) countries, for the communication purposes in various social activities and personal life in that country.

ESP (English for Specific Purposes) Learners. This term refers to learners who study English for their specific (e.g., academic/educational, professional, and personal, etc.) purposes.

In other words, learning English is not the primary and only motive for ESP learners. Under the bigger umbrella of ESP, there are some derivatives of similar abbreviations like EAP (English for Academic Purposes), EOP (English for Occupational Purposes), or ESP (English for Specialized Purposes). Although sometimes confusing, those derivatives share the common goal of learning English for particular goals and purposes other than purely linguistic acquisition.

English language instructor (ELI). It is the language expert who assists the CKI when certain English linguistic issues need to be addressed or emphasized beyond the CKI's capacity and availability. In some types of CBI (e.g., sheltered model) content knowledge and language instruction can be performed by one instructor.

Instructional Design (ID). Also called *instructional system design* (ISD). According to Merrill, Drake, Lacy, Pratt, and the ID2 Research Group (2012), instructional design is the “technology for the development of learning experiences and environments which promote the acquisition of specific knowledge and skill by students” (p. 2).

Linden Scripting Language (LSL). It is a script-driven programming language created by Linden Lab that enables SL users to modify and develop in-world variables (e.g., environment, objects, and avatar behavior) to create more user-oriented experience.

Multi-user virtual environments (MUVE). According Dieterle and Clarke (2008), MUVE is the virtual environment that enables “multiple simultaneous participants to (a) access virtual contexts, (b) interact with digital artifacts, (c) represent themselves through “avatars,” (d) communicate with other participants” (p. 1033), and “(e) take part in experiences incorporating modeling and mentoring about problems similar to those in real world contexts” (p. 1034). SL is a typical MUVE that satisfies the above mentioned characteristics.

Native English speakers (NES). This refers to those who have been using English from birth or an early age as a daily communicative and written language for various activities, purposes, and who live in an English-embracing culture and society. Usually the official language of NES' country of citizenship is English.

Non-native English speakers (NNES). This refers to those who have never or rarely used English as their primary language for communication and social activity. From a very young age or even later they began to acquire this language as their second or foreign language beyond their mother tongue. This includes those who are bilingual (mother tongue vs. English) or multilingual (mother tongue vs. English vs. other languages). It does not necessarily mean they have to reside in a non-native English speaking country (e.g., Asian or Latino immigrants in the U.S.).

Prim (abbreviation for primitive). This refers to the single unit of virtual physical objects created in SL (e.g., buildings, vehicles and avatar garments). An object is made out of multiple prims, depending on the complexity, functionality, and characters of the object.

Second Life (SL). Linden Lab (2003) provided a concise definition of SL as “a 3D [three-dimensional] world where everyone you see is a real person and every place you visit is built by people just like you” (para. 1). For this study, SL can be defined as a 3D-based, multiple users-enabled online virtual learning environment that is designed and developed based on real life and for users to interact and communicate with peers and instructor for various educational or academic purposes.

Second Life viewer (SLV). It refers to the official end-user application that connects individual user's computer to the virtual world of SL. The current stable version is 3.8.0.302622 (Linden Lab, 2015a).

SLURL (acronym for *Second Life Universal Resource Locator*). It is an URL-like address that precisely and directly teleports your avatar into a specified location (premise) within SL.

Target language. It is the language one aims to learn and master. Usually it is not his or her native or mostly used language.

Virtual reality (VR). It is also called a virtual world (VW) (Henderson, Huang, Grant, & Henderson, 2009, p. 465). Rheingold (1991) has defined virtual reality as the individual experience that is surrounded by a three-dimensional, computer-generated representation or simulation of what that person usually embraces as reality. One is able to move in all directions and views such motion and others' from multiple perspectives. Virtual reality can be classified into three categories: immersive, non-immersive, and semi-immersive (ACGC, 1998). Immersive VR primarily requires head-mounted goggles and sensing gloves that provide users access to full immersion. One is able to perceive being "embraced" in the virtual reality. Semi-immersive VR requires a larger screen to simulate one's activity, rather than using goggles. Non-immersive VR is often realized via computer-generated simulation and operated via keyboard and mouse. The user controls a pre-configured avatar to represent him or herself in the virtually created digital world. In that sense, the current version of SL belongs to the third type of VR. It is realized via internet connection with individual computing terminals (e.g., desktop and laptop) and SL servers powered and maintained by Linden Lab. If the user logs off from the SL viewer and turns off the computer, all existing creation and activity in SL are saved, and user's avatar remains idle. This consistency is one of the unique distinctions SL contributes to virtual reality.

3-D virtual world/environment. Conceptually similar to virtual reality, but with emphasis on its capacity of simulating the real world in a three dimensional manner, this is where viewers gain similar sensory experiences as perceived in real life. SL is also seen as a 3-D virtual world or environment; and by its requirement of internet connection between individual users and Linden Lab, it is also categorized as “server-based world” (Nelson & Erlandson, 2012, p. 25).

Virtual learning environment (VLE). It refers to the web-based learning platform created for the purpose of teaching and learning. It may include an instructional website, an educational wiki or blog, and a virtual classroom, course, program or institution in SL. It usually does not replace but, rather, supplements conventional in-class instruction and learning.

Summary

Chapter I introduces the research topic for the dissertation: a study on ESP learners’ experience in the VLE of SL, a topic that has largely been ignored by researchers and practitioners in the field of EFL/ESL/ESP education.

Chapter II presents an intensive review of the related literature. The literature review primarily focuses on empirical studies that were retrieved from intentional and national peer-reviewed publications, scholarly dissertations and theses that were relevant to the topic, and publications from multiple professional conferences in the disciplines of educational technology, computer science, social science, and EFL/ESL/ESP education.

Chapter III details the research methods used for the study. This includes the selection of research design, the description of research setting, participants and recruitment method, limitations, instruments and data collection method. The data were collected entirely in the pre-designed VLE of SL.

Chapter IV presents the findings from the analysis of the data. This chapter provides participants' background information, and addresses the research questions. Qualitative data analysis method was applied.

Chapter V discusses the study findings based on the research questions. The researcher also offers several practical recommendations for ESP learners, instructors, and instructional designers, as well as recommendations for future research. The chapter then lays out the conclusion for the study.

CHAPTER II:

REVIEW OF RELATED LITERATURE

Introduction

The literature review for this study covers a number of interrelated topics. It begins with a brief introduction of Second Life (SL) and how it differs from its counterparts in realizing virtual reality and engaging educational potential. It then summarizes the advantages and deficiencies of using SL as the virtual learning environment (VLE) that is primarily related to higher education, and for various other purposes (e.g., academic, research, professional, teacher education and development). This part of review explores SL's potential for instruction and delivery of content knowledge in multiple subjects and disciplines. Third, the researcher takes an intensive look into studies of teaching and learning English as foreign/second language (EFL/ESL) in SL, and analyzes their merits and drawbacks. The literature review will also discuss the significance of the study. There exists a “gap” in which studies of English language education in SL rarely pay equal and sufficient attention to English for specific purposes (ESP) learners. They predominantly focus on EFL/ESL learners and take a solely linguistic aspect or single-sided approach. Last, the researcher explores one possible way of effectively utilizing SL for the benefit of ESP learners, which is through the implementation of content-based instruction (CBI). It analyzes SL as an viable instructional venue for CBI to engage ESP learning.

The selection of the sources for literature review followed several criteria. First, it included empirical studies and excluded articles that did not address methodology and/or research findings. Second, the databases used for this literature review included Academic

Search Premier, EBSCOhost, Education Full Text, ERIC, and ProQuest (for theses and dissertations). In addition to database searches, searches of journal articles, conference papers and reports from educational/instructional technology-related organizations and societies were also applied, including the International Society for Technology in Education (ISTE), Society for Information Technology and Teacher Education (SITE), International E-Learning Association (IELA), Association for the Advancement of Computers in Education (AACE), Association for Educational Communications and Technology (AECT), and International Association for Mobile Learning (IAMA). Third, the search terms used in abovementioned databases included Second Life, Second Life + education, Second Life + English education, and Second Life + EFL/ESL/ESP/ELL. By doing so, it filtered unnecessary and unqualified sources. However, articles that contained these key words but were written in non-English languages were still excluded. Fourth, the database search time frame was from 2003 (when SL launched) to 2015. Fifth, the researcher identified several existing literature reviews (Aydin, 2013; Dass, Dabbagh, & Clark, 2011; Fang & Lee, 2009; Hew & Cheung, 2010; Hismanoglu, 2012; Inman et al., 2010; Salt, Atkins, Blackall, 2008; Wang & Burton, 2013; Zhang, 2011) that deal with SL and education (general and English), and, therefore, a cross-reference search based on these reviews was last applied to double check for anything missed.

Real Life vs. Virtual Life: A Brief Introduction to Second Life

Linden World, the prototype of SL was conceptualized in early 1991 by Philip Rosedale, the founder and CEO of Linden Lab. His original idea was to create a “microcosm” that can vividly simulate and reflect reality. In November 2002, a beta testing of SL opened to the public with a fee that enabled users to teleport their avatars within SL. If users wanted to use the “land” (namely prim), they also had to pay for that. Those fees were used for maintenance and servers

because VW was running continuously and was networked. Even so, people still found it extremely intriguing and more people joined the growing community of SL. June 23, 2003 was a remarkable date for all SL residents as SL officially went online. In October of that year, Linden Lab improved and supplemented additional communication functionalities. These were realized as part of the goal of building up a resident-centered virtual community. To seamlessly help to transition users from their real life to virtuality, Linden Lab introduced an in-world currency called *Linden Dollar* (L\$) that is freely exchangeable with U.S. dollar (exchange rate is not fixed but fluctuating) for the sole purpose of conducting commercial activity in-world. Later this mechanism was applied for business education by some institutions and programs.

All users are asked to comply with the SL Terms of Service (Linden Lab, 2015b), an agreement acknowledged by its 13 million users. This agreement details users' rights and responsibilities including copyright of their creations in SL, the use of Linden dollars, user privacy and appropriateness, security, and eligibility for using SL among other things. It was estimated by Baker, Wentz, and Woods (2009) that approximately 50,000 to 65,000 users are online at any given time, on a daily basis. Hargis (2008) noted approximately four million in-world residents have obtained a virtual citizenship since 2003. According to Voyager (2013), by September 28th, 2013, there were 35,425,463 signups for SL since its launch in 2003. At least 50,000 people are active in SL.

Linden Lab (2011) later developed SL's educational potential by privileging more free land for educational purposes, and by soliciting worldwide institutions, research institutes, companies and organizations to establish and brand their entities in SL. Many offered instructional courses, virtual field trips, and other academic-related events free of charge to SL residents. Some distinctive features place SL first among other VWs. First, SL has more

“virtual institutions” including some in the Ivy League and other world-renowned institutions. They deliver open courses and lectures in virtual classrooms, so that SL can reach more potential learners than traditional classrooms. Second, the social networking design of SL promises that learners can be immersed in an environment where meaningful and memorable learning experiences occur. Third, user creations and activities remain active and can be retrieved at a later time, and thus, learners can access without time constraints. Last but not least, Ondrejka (2007) pointed out that users have the right and ability “to generate creations of value within a shared, simulated, 3D space” (p. 231). Although many other VWs provide similar collaborative and interactive opportunities, they rarely have achieved something like SL that prioritizes users’ negotiation of meaning and provides necessary tools for creating knowledge and gaining experience. Guest (2007) claimed that SL, as a typical 3D MUVE, is much more popular than other VWs due to its free or low cost for access and comparatively lower technological challenges for novice and normal users. Fetscherin and Lattemann (2008) used the technology acceptance model (TAM) to survey 249 SL users and found that 70% agreed SL had improved their capacity of collaboration and communication. More than 60% perceived SL enhanced interpersonal cooperation, and 56% considered SL easy to use. Finally, Verhagen, Feldberg, Hooff, Meents, and Merikivi (2012) confirmed SL’s economic value and ease of use through empirically testing motivational drivers among 846 SL users.

Second Life and Education in General

Although education was not the original motive for creating SL, its educational implications have been widely recognized by researchers, educators and learners, in both K-12 (e.g., Teen Second Life) and higher education. Stanley and Mawer (2008) coined the term *serious game* to refer to games used for the purposes of advertising, training, presentation,

simulation and education (see Law, 2011). In the early stages of the development of SL, Antonacci and Modares (2005) discussed the educational possibility of SL as a massive multiplayer virtual world. Berge (2008) suggested that SL is something not to be confused with the concept of game because “it has no intrinsic goal-driven rules or intent to playing like a game does” (p. 28). Although there has been a debate on defining SL as a game, some early adopters have already explored its educational potential by comparing SL with other online games. Delwiche (2006) studied how massively multiplayer online games (MMOG) such as Everquest and SL can be used for educational purposes. He suggested that the uniqueness of SL comes from SL having more accessibility, various genres, and flexible extensibility that can be used in education. Based on research done by Garris, Ahlers, and Driskell (2002), Teoh (2011) summarized the differences between 3D online game World of Warcraft and simulation in SL. The former is usually designed as an “imaginary world” (p. 418) that is “separated from real life” (p. 418), with a “fantasy context” (p. 418) and for “entertainment” (p. 418) purposes while the latter is designed based on “real world” (p. 418) scenarios with close connection to users’ “real life” (p. 418) experience in “real context” (p. 418) and served for “computational or for evaluative purpose” (p. 418). Moreover, the reason SL has gained so much attention for its educational significance is mainly because it has a growing number of users and interested educators (Cooke-Plagwitz, 2008). According to Michels (2008), over 300 universities and colleges have already used SL to teach and conduct research. Feldstein (2005) suggested that SL as for educational purpose,

provides a unique and flexible environment for educators interested in distance learning, computer supported cooperative work, simulation, new media studies, and corporate training. SL provides an opportunity to use simulation in a safe environment to enhance experiential learning, allowing individuals to practice skills, try new ideas, and learn from their mistakes. The ability to prepare for similar real-world experiences by using SL as a

simulation has unlimited potential. Students and educators can work together in SL from anywhere in the world as part of a globally networked virtual classroom environment.

According to Dickey (2011), MUVEs like SL offer unique learning platforms with three distinct features: (1) 3D-constructed virtual space that keeps real life in high fidelity; (2) individually customizable avatars that visually represent each user; and (3) interactive tools for interpersonal communications that are in the format of text, audio and symbols (multimedia). Dresang and McClelland (1999) also attributed three elements “interactivity, connectivity, and access” (p. 160) to illustrate SL’s advantage for engaging learning.

Advantages of Using SL in Education

The advantages of using SL for educational purposes discussed in this section are based on several factors that differentiate SL from other VWs in supporting a constructivist approach to learning. First, it offers a creative learning environment that features interaction and collaboration among individual learners, and between an instructor and learners. Second, its openness allows not only instructors but learners to be more autonomous than does traditional teacher-centered education, although it also raises issues and concerns about the power of control over the learning process. Third, the opportunity of enjoying experiential learning that is rarely accessible or available in reality strengthens its educational value, especially for academic advancement and professional development.

Engagement for content knowledge learning. Desiderio, Vitale, Piccolo, Esposito, and Faiella (2009) highlighted SL’s simulation that “can support a disciplinary and interdisciplinary teaching strategy that is motivating and stimulating for students who are more and more oriented to active, constructive and contextualized approaches of learning” (p. 89). One of the most prominent advantages of using SL in education, particularly higher education, is that it allows users to learn with ample exposure to a wide range of pre-designed life-like scenarios in SL, with

optimal time and self-paced convenience (Kaplan & Haenlein, 2009a). McDonald (1997) pointed out that contextualized authentic and text-based materials can be completely presented by computer graphics and images and that content in multimedia format maximally engages and intrigues learners in the learning process. The rapidness and “un-limitedness” of creating subjects and content knowledge in the VLE of SL have ensured it to be an instructionally applicable venue. Carter (2008) studied the learning engagement in SL, and his research findings indicated that SL effectively engages students in learning content knowledge. Similar findings could be also seen from studies done by Bowers (2010), Cooper (2009), and Noteborn, Dailey-Hebert, Carbonell, and Gijselaers (2014). Lamb and Johnson (2009) noted several subjects and disciplines that can be taught in SL, such as language, culture, mathematics, economics, and arts. Table 2 is a comparative chart that demonstrates SL’s capacity of presenting and delivering some content knowledge (discipline and inter-disciplines) in its VLE.

Table 2

Content Knowledge of Various Subjects (Disciplines) Created and Taught in SL

Field of Study (Social Science, Nature Science, Interdisciplinary)	Course/Program and Author Affiliations	Level of Education
Accounting	Central Queensland University (Muldoon, Jones, Kofoed, & Beer, 2008)	UG
	Capella University (Boland, 2009)	UG
	University of Central Florida (Hornik & Thornburg, 2010)	UG
	North Caroline State University(Buckless, Krawczyk, & Showalter, 2012)	GR
	University of Central Florida, University at Albany, SUNY(deNoyelles, Hornik, & Johnson, 2014)	UG
Architecture	Newcastle University (Abdellatif, 2008)	UG/GR
	Bilkent University (Cantimur, 2009)	UG
	East Carolina University (Meggs, Greer, & Collins, 2011)	UG
Art & Music Education	Music Academy Online (Schwartz, 2009)	K-12
	SUNY(Greenberg, Nepkie, & Pence, 2009)	UG
	Northern Illinois University (Han, 2010)	UG
	Northern Illinois University (Lu, 2010)	UG/GR
Counseling	Regent University(Walker, 2009)	UG
History	University of Wisconsin-Green Bay (Morgan, 2013)	UG
Law	Harvard University(Nesson & Nesson, 2008)	UG
	Queensland University of Technology(Butler, 2012)	UG
Literature & Composition	University of Texas at Austin(Mayrath, Sanchez, Traphagan, Heikes, & Trivedi, 2007)	UG
	Fort Lewis College (deWinter & Vie, 2008)	UG
	Middle Tennessee State University (Baldwin, 2009)	UG
	Boise State University (Samuelson, 2011)	UG

Field of Study (Social Science, Nature Science, Interdisciplinary)	Course/Program and Author Affiliations	Level of Education
Management	Pennsylvania State University (Lee, 2009)	GR
	Wright State University(Schiller, 2009)	GR
	Hong Kong Polytechnic University (Duffy & Penfold, 2010)	UG
	University of Houston (Scott, Liu, & Kumar, 2010)	GR
	University of Bedfordshire(Conrad, 2011)	GR
	Maastricht University, Park University(Noteborn, et al., 2014)	UG
Marketing	East Carolina University (Tuten, 2009)	UG
	Boston College (Jin & Bolebruch, 2010)	GR
	University of Western Australia, Monash University, RMIT University(Halvorson, Ewing, & Windisch, 2011)	UG
Museum	Nova Southeastern University (Cool, 2013)	UG
Psychology	Rochester Institute of Technology,Gannon University (Edlund & Hartnett, 2013)	UG
Religious Studies	Pacific University,George Fox University(Zijdemans-Boudreau, Headley, & Ashford, 2009)	UG
	Universiti Sains Malaysia (Zaid, Jamaludin, & Hosam, 2011)	UG
Social Work	Florida Gulf Coast University(Anstadt, Bradley, & Burnette, 2013)	UG
Tourism	Hong Kong Polytechnic University (Penfold, 2008)	UG
	California State Polytechnic University(Singh & Lee, 2008)	UG
	Clemson University (Huang, Backman, & Backman, 2009)	UG
	King's College London (Torno, 2011)	UG
Computer Science	Temasek Polytechnic (Seng & Edirisinghe, 2007)	UG
	Polytechnic Institute of Leiria, University of Trás-os-Montes e Alto Douro (Esteves, Fonseca, Morgado, & Martins, 2009)	UG
	Towson University (Wang & Braman, 2009)	UG
	Heriot-Watt University (Cargill-Kipar, 2009)	UG
	Curtin University (Dreher, Reiners, Dreher, & Dreher, 2009)	UG
	Open University (Rapanotti & Hall, 2011)	N/A

Field of Study (Social Science, Nature Science, Interdisciplinary)	Course/Program and Author Affiliations	Level of Education
	Polytechnic Institute of Leiria, University of Trás-os-Montes e Alto Douro (Esteves, Fonseca, Morgado, & Martins, 2011) University of Aegean (Pellas & Kazanidis, 2013)	UG/HS UG/GR
Engineering	University of the Aegean (Vosinakis & Koutsabasis, 2012) Universidad de La Sabana (Sierra, Gutiérrez, & Garzón-Castro, 2012)	UG UG
Environmental Studies & Geography	Old Dominion University (Noor, 2010) New Mexico State University(DeMers, 2010a)	GR UG
Mathematics	University of California, Berkeley (Harrel, 2009)	UG
Medical Education	Thomas Jefferson University (Toth-Cohen & Gallagher, 2009) University of Maryland (Phillips & Berge, 2009) University of Kansas Medical Center (Gerald & Antonacci, 2009) University of Ballarat (Rogers, 2009) Jefferson College of Health Professions, Kent State University(Toth-Cohen & Mitchell, 2009) University of Plymouth (Boulos & Toth-Cohen, 2009) Capella University (Rose, 2010) Adventist University of Health Sciences (Tao, Lim, & Watkins, 2010) Vanderbilt University(Trangenstein, Weiner, Gordon, McNew, 2010) Michigan State University (Cook, 2011) American Association of Anatomists(Richardson, Hazzard, Challman, Morgenstern, & Brueckner, 2011) Hong Kong Polytechnic University (Chow, Herold, Choo, & Chan, 2012) Edge Hill University,Coventry University,St. George's University of London (Beaumonta, Savin-Badenb, Conradic, & Poulton, 2014)	GR GR GR UG UG UG UG UG UG UG UG UG UG N/A UG UG
Physics	Universidade Luterana Brasileira (dos Santos, 2009)	UG
Information Studies	<u>Communication:</u> University of Texas at Austin (Jarmon, Traphagan, Mayrath, & Trivedi, 2009)	UG

Field of Study (Social Science, Nature Science, Interdisciplinary)	Course/Program and Author Affiliations	Level of Education
	University of Leicester, London South Bank University (Nie, Roush, & Wheeler, 2010) Cape Peninsula University of Technology(Pinteteh, 2012)	UG UG
	<u>Library:</u> San Jose State University (Luo & Kemp, 2008)	UG/GR
	<u>Media:</u> Hong Kong Polytechnic University (Herold, 2009) University of South Australia (Wood, 2009) University of Massachusetts – Amherst(Sullivan, 2009) Charles Sturt University (Hay & Pymm, 2010)	UG UG GR UG/GR
International Studies	University of Technology (Vanni, 2013)	UG

Note. Subjects are listed in alphabetical order; specific programs (projects) are listed in chronological order. (UG=Undergraduate, GR=Graduate, HS=High School)

Career and professional development in SL. Besides its comprehensiveness in providing users with content knowledge, SL also prepares learners for real-world professional development. Table 3 provides a summary of existing programs that have helped learners train and develop essential skills and gain experience as needed in their respective professional realms. It is noted that most of these programs are business-related due to the unique mechanism in communication (Gajendra, Sun, & Ye, 2010) and business-related features SL offers (e.g., Linden dollar).

Table 3

Career and Professional Development in SL

Field of Study (Social Science, Nature Science, Interdisciplinary)	Academic/Professional Affiliations & Programs/Projects Locations/Affiliations
Accounting & Business	Second Life Association of CPAs (Johnson & Middleton, 2008) Towson University(Romero, 2009) University of Edinburgh(McCafferty, 2010) Harbin Institute of Technology(Gajendra, Ye, Sun, & Daying, 2011)
Corporate Training & Job Hunting	University of Central Florida(Bowers, Smith, Cannon-Bowers, & Nicholson, 2008) Università degli Studi di Salerno (De Lucia, Francese, Passero, & Tortora, 2009a) Eygus Ltd., University of the West of Scotland, Open University (Peachey, Livingstone, & Walshe, 2009) Kent state University(Remley, 2010) Virginia Tech(Dannenberg, 2010) University of Calgary, SAIT Polytechnic(Kopp & Burkle, 2010) Capella University(Koufoudakis-Whittington, 2014)
Entertainment & Music	Virtual entertainment in SL (Sutter, 2009) University of Pittsburgh at Greensburg (Schrum, 2009) University of Colorado Denver (Wise, 2011)
Foreign Affairs	Södertörn University College (Bengtsson, 2011)
Journalism	Northern Illinois University (Guzman, 2009) Marquette University (Brennen & Cerna, 2010) University of Porto (Cruz & Fernandes, 2011)
Human Resource	The Open University (Broadribb & Carter, 2009)
Marketing	University of East Anglia, Roskilde University (Barnes & Mattsson, 2011)
Real Estate	California State University, Long Beach (Samala, 2010)

Field of Study (Social Science, Nature Science, Interdisciplinary)	Academic/Professional Affiliations & Programs/Projects Locations/Affiliations
Tourism	Clemson University (Christian, 2010)
Medical Practice	Institute of Psychiatry(Fusar-Poli, Cortesi, Borgwardt, & Politi, 2008) Fielding Graduate University (Cabiria, 2008) Oregon University (Mili, Barr, Harris, & Pittiglio, 2008) Imperial College London (Lafsky, 2009) University of Houston (Siddiqi, Mama, & Lee, 2010) Baylor College of Medicine, University of Montana, Case Western Reserve University (Nosek, Whelen, Hughes, Porcher, Davidson, & Nosek, 2011) University of Hull (Dagleish, 2011) Eastern Michigan University, Università della Svizzera italiana (Cowdery, Kindred, Michalakis, Suggs, 2011)
Consumer Behavior	University of Western Ontario (Martin, 2008) ESCP (Kaplan & Haenlein, 2009b) UMR GAEL, University of La Rochelle(Parmentier & Rolland, 2009) University of North Texas (Thombre, 2011) Dominican University, PookyMedia (Reinhard & Amsterdam, 2013)
Librarian	Pepperdine University (Kowalsky, 2009) Florida State University(Mon, 2009) College of DuPage, University of Kentucky, University of Hawaii at Manoa, George Fox University (Cote, Kraemer, Nahl, & Ashford, 2012) Nankai University (Clarke, 2010)

Note. Subjects are listed in alphabetical order; specific projects are listed in chronological order.

Table 4 illustrates SL's advantage of engaging teacher development, as well as increasing their instructional potential, at both the K-12 and college/adult levels. It is noted that the K-12 teachers are often geographically distant from higher institutions that offer programs in teacher education and development, or their busy work schedules conflict with traditional in-classroom attendance. Howley and Howley (2006) pointed out that due to the insufficiency of local resources and support from urban or district counterparts, rural teachers are often in great need of professional development. Such a situation is not only seen in K-12 teachers but in all others who are isolated from resource-rich metropolitan or urban areas. SL at some level is considered as an alternative or supplement to faculty development and teacher's in-class instruction.

Table 4

Faculty/Teacher Development in SL

Professional Development Level	Features and Benefits
<i>College/Adult Education Faculty Development</i>	
Capella University (Jamison, 2008)	Transition from traditional classroom to VLE in SL was possible and engaging, however, teachers needed adequate orientation and support to ensure and enhance their positive attitude in adopting such novice learning environment.
Texas Woman's University (Dutton, 2009)	Educators perceived the educational potentials SL offers, meanwhile they also recognized its hindrances for utilizing for instruction, which included administrative support and technical limitations.
Florida State University (Mon, 2009)	Playful and immersive experiential environment in SL helped educators and librarians better serve students, concerns for disabled learners were also raised.
Sam Houston State University (Burgess, Slate, Rojas-LeBouef, & LaPrairie, 2010)	Graduate students who majored in instructional technology perceived the applicability of SL as the venue for Community of Inquiry (CoI). And such notion ensured their acknowledgement of SL's instructional potentials.
University of Wyoming (Jennings, 2010)	SL can be used for urban higher education faculty as a social learning tool to engage and enhance their traditional teaching. Faculty shall identify and master proper methodology prior embracing SL as an instructional tool.
Iowa State University (Silva, Correia, & Pardo-Ballester, 2010)	Faculty can be mentored via virtual learning in SL to learn and master such educational technology based on SL's immersive collaboration.
East Carolina University (Ellis & Anderson, 2011)	Adaption of SL with traditional online tools increased collaborative, interactive and innovative teaching experience. Faculty should be encouraged to utilize this alternative educational technology.
Texas State University (Khan, 2011)	Individual instructor was able to teach SL with positive awareness and attitude of his/her social presence in VW, and students' needs should be taken into consideration.
University of Alabama (Blackmon, 2013)	Faculty participants perceived similarity of immersive persona between SL and traditional online mode. SL offers more opportunity for faculty members to construct themselves to better prepare for teaching in this emerging technology.
Chung Yuan Christian University,Texas A & M University (Chien, Davis, Slattery, Keeney-Kennicutt, & Hammer, 2013)	SL helped graduate students from teacher education program better develop curricular by engaging them with self-reflection and self-understanding activity (currere method) in the VLE of SL.
<i>K-12 Teacher Development</i>	
Walden University (Derby, 2008)	Rural teachers utilized SL as a possible professional development tool because they rarely had training opportunity due to geographical distance.
Eastern Michigan University (McVey, 2008)	K-12 teachers who enrolled in graduate level teacher program showed positive attitude communicating in SL as a synchronous discussion tool, although first time users found it less with respects, recommendation was given to gain confidence teaching in such environment.

Professional Development Level	Features and Benefits
University of Nevada (Mahon, Bryant, Brown, & Kim, 2009)	SL could be used for helping pre-service teachers gain experiences in classroom management and student behaviors.
University of Alabama (Wright, Burnham, Inman, & Ogorchock, 2009)	SL helped school teachers better understand cyber-bullying and raised their awareness of the importance of cyber-bullying education.
University of New England (Gregory & Masters, 2010)	Role-playing activities in SL helped pre-service teachers to be engaged in teacher development program distantly without physical restraint.
Lynn University (Storey & Wolf, 2010)	Pre-service teachers perceived the opportunity to be engaged in SL for the development for future teachers that requires them to be equipped with knowledge and experience in emerging educational technology like SL.
University of Piraeus (Vasileiou & Paraskeva, 2010)	Pre- and in-service teachers used role-playing instruction in SL that had positive impact on their learning engagement.
Korea National University of Education (Cheong, Baek, & Kim, 2011)	SL provided valuable environment to enhance pre-service teachers' understanding of teaching techniques necessary for their future instruction.
Iowa State University (da Silva, 2012)	University language teachers explored and identified several affordances for teaching language in the VLE of SL.
Miami University (Dickey, 2011)	Pragmatic use of SL was identified by K-12 in-service teachers; their perception impacted the integration of SL as a new instructional tool for teaching.
Texas A & M University (Ma, Phillips, & McKenzie, 2012)	SL helped pre-service teachers better prepare for content knowledge (algebra) instruction.
Empire State College (Teoh, 2012)	SL's simulation engaged secondary pre-service teachers from multiple majors in one undergraduate level course of language and literacy. They considered SL "could be used as an extra credit option, a supplementary tool, or an enhancement to teaching" (p. 437).
California State University (Selvester, 2013)	SL helped pre-service teachers better understand the learning objective (social roles of gender) due to SL's enhanced interactivity and transformative experience.
University of South Florida, School District of Hillsborough County (Kim & Blankenship, 2013)	Pre-service teachers found it useful participating in professional development activities in SL, due to its quality simulation of real life scenarios.

Note. Programs (projects) are listed in chronological order. ESOL (English as second and other language) teacher development is detailed in later section.

Learner motivation and autonomy. Motivation is defined by Schunk, Pintrich, and Meece (2008) as “the process whereby goal-directed activity is instigated and sustained” (p. 4). Schunk (1995) suggested that motivation in one’s learning process determines what content and method we learn and use, and when we feel like learning. Dalgarno and Lee (2010) have claimed

that SL as a virtual micro world with real life simulation “can be intrinsically motivating and engaging as a result of the high degree of personalization that arises from the ability of the learner to make choices in attempting to achieve individual goals within the environment” (p. 20). Motivation is one of the “psychological needs” (Partala, 2011, p. 787) SL can satisfy by considering usability design to privilege users’ sense of “psychological ownership” (Lee & Chen, 2011, p. 269) in its VLE. Robert and Dennis (2005) noted that synchronous learning (e.g., SL) increases learners’ motivation, mainly because learners are engaged in an ongoing activity that stimulates and encourages them to participate. Keskitalo, Pyykkö, and Ruokamo (2011) pointed out that, due to its “attractive appearance, the existence of avatars, and a shared place, as well as the possibility of communicating synchronously, SL has succeeded in capturing the interest and motivation of most learners” (p. 17). Thus, one’s motivation toward learning can be maximized when he or she is given optimal autonomy, because “autonomous learners are by definition motivated learners” (Ushioda, 1996, p. 2). Learner autonomy is defined by Holec (1981) as “the ability to take charge of one’s own learning...to have, and to hold, the responsibility for all the decisions concerning all aspects of this learning” (p. 3). Du (2011) claimed that a learner’s intention plays an important role in determining his or her attitude toward adopting SL as a learning tool. In other words, learners should be actively seeking meaningful and applicability when utilizing SL for their learning. This is distinctive from traditional face-to-face instruction, and Inman et al. (2010) has suggested that SL can “encourage and foster alternative forms of education which are learner-centered rather than teacher-centered” (p. 54).

Cooper (2007) has considered SL a suitable platform for learning due to its high fidelity in 3D animation that stimulates beginners’ interest in exploring novice knowledge. In a case

study conducted by Good, Howland, and Thackray (2008), participants demonstrated greater motivation in a problem-based learning approach in SL, even when there was anxiety caused by unfamiliarity with the new learning environment. Jarmon, Traphagan, and Mayrath (2008) noted that their participants demonstrated either neutral or positive attitudes toward using SL as a learning tool. Their instructional design also incorporated a problem-based project that was suitable for experiential learning. Lowe and Clark (2008) also noted that their undergraduate participants expressed a willingness to implement SL if they were instructors, even when they encountered certain frustrations themselves, and that their overall experience with SL was positive. In another study by Lowe (2008), graduate students felt SL was fun, beneficial, and helped them build connections with peers. Triplett, Mennecke, Hassall, and Jordan-Conde (2009) believe that SL enhances learners' experience by allowing them to communicate in a relaxed yet constructive manner. Mount, Chambers, Weaver, and Priestnall (2009) further stated that SL's capacity of immersing students in its VLE motivates them to be autonomous learners. This conclusion was drawn from a JISC-funded project titled "DEsign of Learning spaces in 3D Virtual Environments (DELVE)" that involved 20 students in pre-designed substantive tasks in SL. Zaid et al. (2011) studied how Saudi students used SL to learn Islamic concepts, and their findings indicated that students' perception of satisfaction are determined by the course content, delivery method, learning relevance to their real lives, and the opportunity of connecting virtual learning with traditional in-class learning. The primary reason their participants showed positive attitudes toward learning in SL is because class "was delivered using the online environment to create active learning opportunities for students that helped them engage with challenging concepts and provided self-assessment and self-reflection opportunities" (p. 1861). In teacher education, Selvester (2012) studied how pre-service teachers used SL to understand gender roles

in society. Participants demonstrated great interest while their understanding about the subject was enhanced. Collins (2012) studied how students and an instructor collaboratively integrated SL into their existing classroom activity and concludes that “the use of SL provided a stimulating educational platform even when technical issues such as lag, software crashes, and improper equipment made the use of the software challenging” (p. 140) because “students are socially interactive, [they] can create a community of learners, and enjoy the learning process” (p. 140).

In the field of foreign/second language education, Pares-Toral (2013) concluded from her phenomenological study that SL motivates and enhances participants’ academic achievement and language competency of Spanish as foreign language by immersing them in the target language and culture created in the VLE of SL. Lin, Wang, Grant, Chien, and Lan (2014) studied how SL helped a Chinese language teacher engage learners in a comfortable environment, and that students’ learning motivation increased so they were able to focus solely on the content knowledge. In the realm of higher education, Chau, Sung, Lai, Wang, Wong, Chan, and Li (2013) recently compared the educational advantages between SL and traditional learning environments and conclude that SL has great potential for eLearning. This is because such a virtual environment liberates students in a relatively autonomous and intriguing capability. Rahim (2013) studied how two Asian higher institutions (Temasek Polytechnic and Hong Kong Polytechnic University) utilized SL for intercollegiate collaborations and knowledge sharing. The survey results indicate that SL “has positive effects on students’ learning, motivation and attitudes towards learning” (p. 1). Hence, as Masgoret and Gardner (2003) indicated, among all other subject learning, “motivation is more highly related to second language achievement” (p. 205).

Collaboration among learners. Kumaravadivelu (2003) has suggested that learners should understand the significance of collaboration with their peers, their instructor, and even the entire educational system. Kim (2013) has suggested that collaboration is important because “students are not simply taking in new information or ideas; they are creating something new using this information and ideas. These acts of intellectual processing, construction of meaning, or creation of something new are crucial to learning” (p. 13). Ondrejka (2008) noted that, as one of its most prominent educational features, SL can engage learning collaboration when “residents spend a great deal of time in-world educating each other in both direct and indirect ways” (p. 244). By doing so, it increases their creativity and peer reflection, and individual learners within that community act together to construct the knowledge in order to gain the essential experience and skills to succeed. Such collaboration is mostly “cost-effective” (Smart, Cascio, & Paffendorf, 2007, p. 7) and requires little or no investment in time and preparation. According to Barkley, Cross, and Major (2004), there are five types of collaborative techniques in constructivist learning: discussion, reciprocal teaching, problem solving, graphic information organizing, and collaborative writing. These techniques can be applied when learners are given ample autonomy. SL’s multimedia functionality privileges learners with relatively higher autonomy, and therefore satisfies the possibility of utilizing these five techniques (see Andreas, Tsatsos, Terzidou, & Pomportsis, 2010).

Minocha and Morse (2010) studied how SL supported a group of students working together on a team project from a distance. They noted that SL’s ability to leverage individual collaboration among geographically distributed team members enabled them to work together as a virtual team. Similarly, Montoya, Massey, and Lockwood (2011) suggested that SL “has the potential to allow team members to interrelate in a much richer way while interacting with and

within the environment” (p. 452). Steele (2013) concluded from her study that collaboration in SL engages learners’ mutual trust and therefore enhances their group learning outcomes. Strobel and Hawkins (2010) have considered SL’s collaboration to be useful for informal education because it engages learners to “improve skills, gain expertise and express creativity” (p. 5). Larach and Cabra (2010) concluded from their study that collaboration in SL tends to be more creative. De Lucia et al. (2009b) noted that, although there was no great difference between SL and face-to-face collaboration “in terms of performance, comfort with communication, and overall satisfaction” (p. 1025), SL can “be an effective customizable delivery environment to alternatively adopt with respect to a real world” (p. 1052), because face-to-face collaborations often seem unrealistic and demand more labor and extra expenditures. Abbattista, Calefato, De Lucia, Francese, Lanubile, Passero, and Tortora (2009) suggested that SL as 3D environment does not interfere with normal communication but provides richer elements to the synchronous text-based communication. Virtual collaboration in SL can be in the format of “synchronous distance lectures, socialization activities, virtual laboratory, [and] serious game” (p. 6). Alrayes and Sutcliffe (2011) claimed that SL is preferred for casual discussions and tutoring due to its less rigid environment. Their participants preferred in-world collaboration because it is “cost effective, enhances creativity, [provides] virtual interaction [...] virtual presentation [...and] synchronicity” (p. 13). Wang, Anstadt, Godlman, and Lefaiver (2014) also noted that group discussion is one possible collaboration that can be facilitated in SL to engage effective and productive synchronous communications. Keskitalo et al. (2011) studied SL’s potential for global collaboration among several universities in Netherlands, USA, and India. It is noted that SL could be used in distant collaboration so that students from different institutions could work on the same design project while they evaluated other’s work and reflected on their own

performances. Corder and U (2010) also noted that SL helps learners enhance intercultural collaboration, which is also SL's advantage over 2D tools (e.g., blogs, wikis, and online discussion forums) in realizing such collaboration. They also suggested that the integration of 2D and 3D tools should be taken into consideration to make collaboration more diverse and effective. Sutcliffe and Alrayes (2012) studied the differences of face-to-face, Blackboard, and SL collaborations by comparing their affordances in providing collaborative opportunity. They concluded that SL offers better user experience than the others because it "helped motivation and socialization stages" (p. 508). They also suggested that "integration with other technologies is necessary for knowledge construction" (p. 508). In addition to engaging student's collaboration, SL also benefits researchers and educators of various disciplines to work collaboratively at a geographical distance. Jarmon and Sanchez (2008) explored how Educators Coop, the first educator and researcher-based SL virtual community, helped its residents to better collaborate, learn, and network with peers. Participants praised SL for enhancing interpersonal communication and mutual learning.

Learning accessibility. Learning accessibility in SL is multifold. First, there is accessibility for content knowledge to be engaged for experiential learning. It is perceived that what we learn depends to a great degree on what we experience in our environment. Li, Chao, and Li (2013) emphasized that it is always difficult to design an effective yet meaningful experiential learning environment in reality, because not every learner lives in an equally accessible environment. Their knowledge and views about the external world are heavily affected by the existing resources and conditions they experience. What is more unfavorable to experiential learning in reality, as Jung (2002) has suggested, is that "most schooling today is based upon third-person knowledge such as how students learn or what they learn about, without

the opportunity to directly experience for themselves the thing that they seek to learn” (para. 5). Geographical immobility and financial insufficiency are two major issues that hinder students of underdeveloped and developing countries and regions from accessing and enjoying quality learning experiences. SL provides an incomparable alternative to transfer and convey learning objects from real life into VW with authenticity and originality. SL’s conditions and advantages for experiential learning are discussed in a later section.

Second, there is the aspect of accessibility for learners with (learning) disabilities. According to the *Americans with Disabilities Act* of 1990 and its 2008 amendments, qualified individuals with disabilities must enjoy equal rights and benefits from internet-based education as well as classroom-based programs (Burgstahler, 2012). SL for educational purposes takes the needs of disabled learners into consideration. Cromby, Standen, and Brown (1995) have claimed that VR offers opportunities for children, especially those with a physical disability/disadvantage or psychological symptoms (e.g., autism, ADHD, depression, and obesity, etc.) to experience a simulative world that usually is unavailable to them in reality due to factors of time, safety, and distance. SL also enables social support groups to be formed beyond physical distance and identity exposure (Green-Hamann, Eichhorn, & Sherblom. 2011), such as Alcoholics Anonymous (see Van Lear, Sheehan, Withers, & Walker, 2005). Smith (2012) studied SL’s ability to engage learning and create mutual understanding among people with visual impairments and cognitive disorders, and he concludes that SL offers those with impairments a platform to share stories and information in order to raise and strengthen the sense of community and belongingness. Stendal, Balandin, and Molka-Danielsen (2014) noted that SL provides people with lifelong disabilities the sense of inclusion to one’s community by making friends with members and other forms of socialization. SL has the ability of uniting both

psychologically and physically challenged or disabled individuals by engaging them in community-oriented activities and services (see Dziorny, 2012; Lee, Layne, McFarlin, O'Connor, & Siddiqi, 2011; Muircastle, 2012; Parker, 2008; Smith, 2012). Hence, SL is seen an essential supplement or viable alternative for current inclusive education.

Third, there is accessibility as learning opportunity. The unique combination of asynchronous and synchronous learning enables learners to access educational resources without physical and time restrictions, and this reduces or alleviates the insufficiency of local resources. It is critically beneficial for learners with limited learning resources and inability to travel.

SL as supplement to academic mobility and distance education. Gürüz (2011) coined the term “academic mobility” (p. 20) to describe the phenomenon in which academic and scientific exchange and cooperation are realized between participants in different locales. Much of this occurs between developing/underdeveloped and developed countries, simply because the latter have insurmountable advantages in providing various recourses like quality education, advanced research facilities, and sufficient funding. Such mobility is also physical because it requires researchers and students to travel to the target countries. Although it seems such mobility has become a steady trend with globalization, it still has some inevitable barriers such as family, financial, psychological, and social factors that hinder students from studying abroad (Sanchez, Fornerino, & Zhang, 2006). Also, Klahr and Ratti (2000) pointed out that the English proficiency has a tremendous impact on scholars and students' choice of English speaking countries as their research and study destinations.

Virtual mobility, however, offers equivalence of quality education and research resources compared with what physical mobility offers without traveling abroad. SL can be considered virtual mobility as it provides users of one country access to the courses, resources and study

schemes of another country via its VLE while participants remain in their own countries. Seibert-Couch (2011) indicated that “classes held online in virtual world environments provided online convenience for students and reduce the amount of traveling to class while providing an enjoyable and perhaps even more effective experience” (p. 57). The virtual mobility of SL makes it a potential alternative to traditional distance education. Zarraonandia, Francese, Passero, Aedo, Tortora, and Diaz (2011) studied how SL supports the effective use of distance lecture, one of the commonly used instructional modes in the virtual classroom. Survey results indicated that students perceived SL as a good distance modality, and they also showed positive attitudes toward adopting such new technology for their future courses. Similarly, in Seibert-Couch’s (2011) study on students’ perceptions of the educational implications of SL for distance learning, almost all participants expressed positive attitudes and were welcoming and willing to utilize SL. Holmber and Huvila (2008) compared SL as a distance learning tool with web-based learning environments and face-to-face education to determine which type of learning was perceived most effective. They concluded that students did not consider SL to be the best option in engaging real physical presence, and agreed that it was unnecessary to replace face-to-face education by SL. However, its multimodality in communication did stimulate a “fun factor” into learning that the other two types of learning could not easily achieve.

Currently, there are two types of distance education that occur in SL. One serves as a complement and enhancement to the traditional in-class activity as the majority of learning is still based on physical campuses. The other includes courses and programs taught completely in SL. Abdellatif (2008) studied the benefit of using SL as potential distance learning tool to engage architecture students’ virtual communication in supplement to their real interaction. The study summarized three advantages of using SL for architecture design: (1) it increases

opportunity for exchanging ideas for design; (2) it engages more conversation among students; and (3) their dialogues can be recorded and shared for others to review. SL for distance education tends to favor learner-centered modality. Vanni (2013) conducted a study on how students perceived SL as a distance-learning platform to work on an international studies project with their instructor who was geographically distant from them. Students attributed the “intrinsic multimodality” (p. 373) as SL’s advantage in relation to their learning environment. Specifically, such multimodality is “the mixture of sounds, images, spatial organization, written texts and at times multimedia texts imported from YouTube” (p. 373). They also considered the embodiment of an avatar a unique benefit that distinguishes SL with other VWs. Ritzema and Harris explored the viability of using SL to learn computer science from a distance. They concluded that SL can be used for learning complex and logic-oriented subjects such as computer science, due to its “ability to construct a realistic multi-agent environment, without the need to write code implementing physics or network communications” (p. 111). Edirisingha, Nie, Pluciennik, and Young (2009) studied SL’s capacity for fostering socialization in distance learning over those conventional text-based online environments. They noted that SL has the feature of creating lifelike avatars that create a sense of social presence among other media, and, therefore, enhances their motivation and engagement. Moreover, SL can also be used independently as an online program at the college and postgraduate levels. Robertson (2012) discusses an online master’s program in equine science offered by University of Edinburgh, where students demonstrated positive attitudes toward using SL as a medium for distance education. They thought of SL as “their place” to share and they were able to interact in a relatively secure environment.

Extension of traditional “brick and mortar” institutions in SL. Wong (2006)

suggested that the future of classrooms in higher institutions should not be restricted to the campus, but, rather, people should have opportunities to be educated in VWs such as SL. Although the majority of the higher education is based upon a “brick and mortar” presence, the educational potential VW offers is significant. Jennings and Collins (2007) noted that 170 accredited educational institutions had their virtual campus in SL in 2007, most of which were U.S-based institutions, and that the number was rising rapidly worldwide. Kirriemuir (2009) suggested that SL would become the de facto choice for UK’s higher education in VW. Many have utilized VW to conduct research, deliver lectures and brand and promote their physical entities.

Linden Lab (2013) lists some virtual universities that were created in SL. Residents can access those premises and obtain useful information without coming to the physical campus. Early adopters of virtual institutions include the Alliance Library System in Peoria who opened the first virtual library in SL (Jennings & Collins, 2007), the very first credit-based college level course offered by Harvard Law School (Lamb, 2006), the blended (in-class vs. SL) master program in clinical management offered by Coventry University (Stott, 2007), and the Kamimo Project (Creelman, Petrakou, & Richardson, 2008; Molka-Danielsen, Deutschmann, & Panichi, 2009), the very early inter-collegiate in-world cooperation among University College Molde (Norway), University of Kalmar (Sweden), and Central Missouri University (USA) that explored SL’s potential in higher education. The trend of higher education in the virtual environment of SL now tends to focus on intra- and inter-collegiate cooperation and academic/research exchange worldwide.

Dalgarno, Lee, Carlson, Gregory, and Tynan (2010) also performed a similar study in Australia and New Zealand. The initial findings reveal that the participants responded with positive feedback that illustrates the significance of SL in higher education, which was also consistent with other international outcomes from study done in UK and the USA (see Resta & Shonfeld, 2013). Pellas and Kazanidis (2013, 2014b) compared the use of SL into blended (in-class vs. online) and online courses at both undergraduate and graduate levels. Their study results show that graduate participants in SL online courses demonstrated more positive learning outcomes than those in blended courses. Lester and King (2009) analyzed two groups of participants who took the same course and were taught by the same instructor via either face-to-face or online methods (with Blackboard and SL), and the findings showed that participants from online group yielded equal learning outcomes while they enjoyed the learning environment in SL more. Layne, Lee, O'Connor, Horn, and McFarlin (2009) noted that SL could help institutions enhance student retention in pursuing and completing degree programs. McGregor and Reeser (2009) reported that SL has helped students from Texas State Technical Colleges to be more engaged in distance learning. Berbano (2010) studied how Iowa State University (ISU) implemented and utilized SL as a comprehensive platform for ISU's personnel to collaborate on a daily basis. The findings identify three pedagogical motives for ISU to implement SL: "richness of content, richness of student response, and cost savings" (p. 84). Franetovic (2013) confirmed from her case study that SL offers college-level participants an authentic learning environment by engaging them in co-creation and role-play activities, team projects which in real life could be accomplished more effectively in a blended or hybridized way. De Lucia et al. (2009c) concluded from their study that SL's virtual environment extends the traditional campus by providing an equivalent or more effective communication method for students, faculty, and

staff to interact within and outside the virtual community. Lan, Kan, Hsiao, Yang, and Chang (2013) have emphasized that this unique advantage is quite beneficial especially for those “nontraditional students who are unable to attend classes because of work, family, or traveling commitments” (p. 184). SL enhances the idea of lifelong learning (De Freitas, Rebolledo-Mendez, Liarokapis, Magoulas, & Poulovassilis, 2009). While De Lucia et al. (2009c) also agreed that the virtual institution does not necessarily replace the primary role of its “brick and mortar” counterpart, the potentials and benefits SL has provided for higher education are obvious and being enjoyed by those who confidently utilize it.

SL as research tool and research advancement in SL. In addition to instructional purposes, SL can also be applied for conducting research (Feng & Song, 2010). Currently, SL has made two major contributions toward academic and scientific research. First, SL as research tool can be used as a single or as part of multiple instruments for certain projects, such as surveys (see Bell, Castranova, & Wagner, 2009; Briones, 2014; Cocciole, Chae, & Natriello, 2007; Dean, Cook, Murphy, & Keating, 2012; Messinger, Stroulia, Lyons, Bone, Niu, Smirnov, & Perelgut, 2009; Moschini, 2010; Rak, 2009), interviews (see Dean, Cook, Keating, & Murphy, 2009; Hasler, Tuchman, & Friedman, 2013), assessments (see Olasoji & Henderson-Begg, 2010), participant recruitments (see Cassanova, 2009; Haque & Swicegood, 2013), as well as for teaching research methodology (see Bhattacharya, 2014). The reason for using SL as research tool is because it can reach more participants than more traditional instruments, and the nature of the virtual environment protects participants’ confidentiality especially when they are members of vulnerable groups (e.g., minors and disabled).

Second, SL as a research platform offers ample opportunities for researchers. SL as a micro-world is constructed with the same or similar social mechanisms and principles as can be

perceived and reflected in real life. Several studies in the field of social sciences (e.g., arts, business, communication, education, ethnography, law, literature/literacy, psychology, and sociology, etc.) were conducted using the virtual environments of SL (see Antonijevic, 2008; Bardzell & Odom, 2008; Behm-Morawitz, 2013; Carrington, 2013; Clark, 2014; Dawkins, 2011; Diehl & Prins, 2008; Firat & Yurdakul, 2011; Gard & Goda, 2007; Girvan & Savage, 2010; Grosman, 2010; Han, 2011; Harrison, 2009; Hillman, 2011; Jin, 2009; Kock, 2008; Koutra, Papalakis, & Sanchez, 2014; Krecker, 2014; Krotoski, 2009; Lawless-Reljic, 2010; McAulay, 2008; Minocha & Reeves, 2010; Minocha, Tran, & Reeves, 2010; Moon, 2007; Olapiriyakul, 2010; Padilla-Miller, 2014; Rycroft, 2007; Schackman, 2010; Schlegel, 2014; Sharma, Qiang, Wenjun, & Qi, 2013; Smith, 2011; Stewart, 2014; Voloj, 2012; Wagner & Ip, 2009; Wilkes, 2009). Moreover, SL can also be utilized for research in the field of natural science. Bainbridge (2007) has suggested that SL as a virtual environment allows researchers to conduct experiments and simulations in virtual laboratories, as well as research in observational science (see Attasiriluk, Nakasone, Hantanong, Prada, Kanongchaiyos, & Prendinger, 2009; Boulos & Toth-Cohen, 2009; dos Santos, 2012; Gorini, Gaggioli, Vigna, & Riva, 2008; Lindsay, 2011; Selvester, 2012; Suomi, Mäntymäki, & Söderlund, 2014) and computer science (see Esteves, Antunes, Fonseca, Morgado, & Martins, 2008; Kumar, Chhugani, Kim, Kim, Nguyen, Dubey, Bienia, & Kim, 2008; Varvello, Ferrari, Biersack, & Diot, 2010; Varvello, Picconi, Diot, & Biersack, 2008; Varvello, Picconi, Biersack, & Diot, 2009), since SL was originally created based on the principles and knowledge in computer programming and related mechanisms. Ondrejka (2007) points out that the relatively cheaper expenses for creating virtual experiments in SL also “lower the cost of learning” (p. 28), which is the “critical driver of innovation” (p. 28).

Drawbacks of Using SL in Education

Admittedly, as with all other great educational technologies, SL is not a “panacea” for eliminating any educational disadvantage. There are still several factors that hinder the use of SL for education. These include factors from learners, teachers, institutions, and SL itself.

Learners and instructors' negative perceptions and attitudes toward utilizing SL.

One of the most prominent drawbacks that can be seen in SL is learners' steep learning curve. This issue has been identified by several researchers (Aldosemani, 2014; Anthes, 2007; Cheal, 2009; da Silva, 2012; Inman et al., 2010; Mayrath et al. 2010; McKay, van Schie, & Headley, 2008; Pfeil, Ang, & Zaphiris, 2009; Sanchez, 2009; Taylor & Chyung, 2008; Wang & Braman, 2009; Warburton, 2009). The primary reason is that SL as a VLE is comparatively complicated for novice learners, especially those who are not computer literate or proficient. They must deal with technical issues before embarking on actual learning in SL. If this unfamiliarity and a buffering period occur over time, learners might express technical anxiety for using computers (including peripherals) and related applications in interaction and communication (Baker, Wentz, & Woods, 2009; Brown, Fuller, & Vician, 2004; Carr, Oliver, & Burn, 2010; Matsumura & Hann, 2004). Rogerson, Nie, and Armellini (2012) studied how postgraduate students who majored in an applied linguistics and TESOL (teaching English to speakers of other languages) program perceived the ease of use of three educational technologies: voice boards, E-book readers, and SL. Among these three applications, participants found SL to be the most difficult one due to its complexity and high demand for concentration and attention. Therefore, it can incur a higher investment with a lesser impact on their learning experiences. Sanchez (2007a) studied undergraduate students using SL in their literature course, and he concluded that the “lack of instructions within this Second Life implementation along with technical and interface

difficulties coupled with student's not understanding the purpose of the activities led to feelings of anger" (p. 1043). Zhang (2013) indicated that instructors' increasing workload in SL is one of the major factors that makes them reluctant to adopt SL as an instructional tool.

Second, not all studies about SL demonstrate the positive attitude from learners' perspective. According to Zhou, Jin, Vogel, Fang, and Chen (2011), individual users with different ages, genders, and educational backgrounds tend to show their motivations and interests in utilizing SL for educational purpose differently. Those who are older and educated with higher academic degrees show more effort and interest in exploring SL's research and educational functionalities. Inman (2011) studied how pre-service teachers learned to use SL as instructional tool for their future students, and only 26% of the total participants reported that they felt comfortable using SL for their future students. Lambert and Kidd (2008) reported that graduate students in their study did not see the educational value of SL. Vogel, Guo, Zhou, Tian, and Zhang (2008) used the technology acceptance model (TAM) and its revised revision to evaluate users' perception of the usefulness and usability of SL. Their findings show that participants considered SL one of the least useful learning tools among all other tested applications. However, Saeed, Yang, and Sinnappan (2009) also pointed out that the original TAM should take hedonic factors into the evaluation, since SL as one type of MUVE is in nature entertainment-enabled and, therefore, one's perception of SL's usefulness and usability is also affected by his or her non-traditional motivational constructs. FitzGibbon, Oldham, and Johnston (2008) stated that the reason education major participants did not consider SL as a learning tool was due to SL's "lack of awareness and a *fortiori* experience" (p. 1403). Also, Sykes, Oskoz, and Thorne (2008) have suggested that SL is less stable for a secure learning environment. In Carter's (2008) study, students enrolled in one SL online course consistently

found a “lack of opportunities for deliberation and discourse, as well as a lack of intellectual and social interaction among peers and the instructor” (p. 22). Moreover, Bortoluzzi (2012) identified that the majority of virtual learning is “Anglo-Western” (p. 127) based, and, thus, learners of other cultural and social backgrounds might not easily accept and adapt to such a model (see Vogel et al., 2008). Jarmon (2009) indicated that students’ “duration of time spent in SL and the frequency of students’ visits to SL” (p. 6) are two important factors that affect students’ perception of the usefulness of SL. Therefore, Inman et al. (2010) have recommended that “educators should establish a clear connection between course objectives and course activities in [SL]” (p. 54) in order to meet students’ actual needs.

Third, many teachers find it difficult to incorporate SL into their existing instructions and curricular, as it seems to require a relatively higher skill and degree of experience in designing and implementing virtual learning courses and programs (Blackmon, 2013; Chittaro & Ranon, 2007), and sometimes an in-depth knowledge of computer programming. Those who are positioned as the mainstream force in academia are mostly in their late 40s and 50s and are often seen as less technology-savvy *digital immigrants* than their students who were born much later and are labeled as *digital natives* (Prensky, 2001, p. 1). Chien (2012) pointed out that one of the very reasons of “hindering integration of technology into curriculum is the generation gap between digital natives and digital immigrants” (p. 14). And, since there is incongruence between one’s attitude and actual practice, teachers’ perceptions of the usefulness of technology might directly lead to the reluctance to use what SL offers (see Dagleish, 2011). For instance, Johnson (2011) studied how Millennial-aged students, faculty, and staff from one community college in a Mid-Atlantic state perceived the effectiveness of SL in their daily teaching and learning activities. The findings show that not everyone acknowledged and embraced SL’s

educational significance, especially those who have never or rarely used technology on a daily basis. In sum, teachers' beliefs and willingness toward using educational technology (e.g., SL) are greatly affected by the availability of training opportunities, external supports, accompanying resources, and references for instruction (Schrum, Shelley, & Miller, 2008). Calongne (2008) reminded us that teaching in VLE demands an adjustable pedagogy, and Macedo and Morgado (2010) have suggested that content creation in SL is a time-consuming process and sometimes involves copyright issues. Collins, Jeffery, and Berge (2008) have emphasized the necessity for faculty to change their roles as they transition from traditional teaching into SL's VLE. Atkins (2008) suggested that instructors should have multiple roles in SL: a SL resident, a learner, and a practitioner. Each role relies on the other two and they are interdependent. These multiple roles can greatly affect learners' self-efficacy and autonomy in SL (Pellas, 2014; Storey & Wolf, 2010). Instructors also need to adapt themselves with different learning modes (e.g., synchronous, asynchronous, and mixed) (Bignell & Parson, 2010), help cope with possible communication challenges in the VLE of SL (Sherblom, Withers, & Leonard, 2009), and implement possible intervention to engage class participation (see Wingard, 2014).

Institutional readiness and receptivity for SL. Although many learning institutions have adopted SL as either an instructional tool for teaching and learning in multiple disciplines, or institutional medium to promote and engage school administration and student affairs, the significance and outcomes are individually distinctive. This is mostly attributed to what Desiderio et al. (2009) have identified the "critical points such as lack of investments, the inadequacy of technological infrastructures, as well as the resistance to modernization and to change of many teachers, anchored to traditional teaching methods" (p. 92). Differences in these critical points have led to varying degrees of institutional readiness and receptivity among

individual schools. Second, many school administrators and faculty are skeptical about the accountability of SL for learning (see Dutton, 2009). These critics hold the view that SL in its original formation is game-based “playful” interaction, since there has not been a clear division and definition between (serious) game and instructional use. This is true even though SL has been shown to be beneficial for learners by interchangeably engaging them in collaborative, cooperative, and individualized learning. These critics are concerned about users’ “virtual addiction” (Boellstorff, 2010, p. 177) to SL that might potentially dissociate them from real life, and distraction “by outside avatars could drop in during an active class without warning and without being invited” (Mark, 2014, p. 166).

Third, Dalgarno, Lee, Carlson, Gregory, and Tynan (2011) have suggested that “academic staff have chosen not to adopt them, due in large part to the complex array of technical and policy hurdles that must be negotiated in order to make use of such resources within higher education institutions” (p. 316). They conclude that the inadequacy of internal technical support, the lower awareness and familiarity of SL’s usability in higher educational settings, and the ignorance of equity and ethical issues are some major attributes that negatively affect faculty and staff’s willingness to use SL in their daily work.

Last but not least, as Herold (2012) pointed out, some institutions are also concerned with the negative image that the media ascribes to SL (see Graves, 2008). He has indicated that “conducting educational activities in an environment branded dangerous by the media, is often too much of a risk for educational administrators and institutions who worry more about the public ‘face’ of the university than about academic publications” (p. 8). Sanchez (2007b) has suggested that, in order to properly implement SL into a university classroom, we should broaden our view of SL from a solely educational application to that of a sociotechnical system.

The first technical aspect would be concerned with “computers, networks, tutorials, hardware, and policy” (para. 14) and the latter one would focus on “creating social spaces, opportunities for in-word assistance, demonstrating the presence of others, continuous feedback loops from various users, and providing social as well as instructional activities” (para. 14). As the ultimate decision-maker and direct practitioner, an individual academic institution holds absolute autonomy that can influence its attitudes (either positive or negative) toward embracing and incorporating technology into daily teaching and administration.

Technical issues in SL. Malaby (2009) noted that Linden Lab’s mission statement clearly proclaims that they “will struggle to have Second Life work in any country, be available to anyone wanting to use it, and work well on a wide range of computing devices” (p. 143). Although Linden Lab technicians and SL enthusiasts from all over the world have jointly endeavored to improve user experience in SL, some technical issues still exist that hinder the successful development and promotion of SL (Stoerger, 2010; Warburton, 2009).

First, as an online service SL requires a reliable network connection between a user’s computer and SL’s server, so there may be an issue in internet connectivity and bandwidth (Bessière, Ellis, & Kellogg, 2009; Hansen et al., 2008), as internet speeds across individual users vary dramatically. For instance, dial-up is the slowest way of connecting to the internet, and therefore, it is realistically impossible for users to run SL with such an option. Wireless can provide faster speed with broader bandwidths; however, it is relatively unstable and greatly affected by physical obstacles that would weaken the signal. Cable and DSL are two preferable and mostly recommended internet connection options (Linden Lab, 2013a), but they are the most expensive services in terms of monthly service fees, ranging from \$30 to \$90 and above in the USA, depending on the actual bandwidth users choose.

Second, the universal compatibility of SLV with computing devices is still pending, and therefore, there may be a software issue (Harmon & Jones, 2001; Taylor & Chyung, 2008). The original design of SLV was only for running on traditional desktops and laptops. However, with rapid technological breakthroughs, mobile devices are emerging into our digital life, and handheld smart phones and tablets are two major innovations in personal computing devices. Unfortunately, current SLV is not compatible with them due to the hardware, software and internet limitations. This devalues SL's potential for mobile learning that emphasizes "learning on-the-go" (FCC, n.d., para. 2).

Third, due to the increasing expansion of both residents and prims, in order to avoid and minimize the in-world lag and server redundancy, a normal virtual classroom can hold a maximum of 100 learners at a time, and, therefore, SL is not suitable for classes and lectures with larger enrollment, which is what a typical physical classroom always demands.

Fourth, Atkinson (2008) pointed out that SL also faces issues in cyber security. Miller (2008) warned that virtual attacks may target SL residents who might fall victims to ID theft, intellectual property infringement, spams, fraud, and inappropriate content for minors. Samala (2010) reminded us that Linden Lab keeps tracking users' registration information for authentication purpose, but if it is handled improperly, the private data could be compromised and abused. Adrian (2008) also emphasized that one's reputation that is associated with his or her virtual identity is somehow vulnerable to be denigrated.

Last but not least, the trend of the digital divide tends to be more polarized. According to the Organization for Economic Cooperation and Development (OECD) (2001), the digital divide is defined as "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and

communication technologies (ICTs) and to their use of the internet for a wide variety of activities” (para. 1). Such a divide can be found in both domestic and international contexts. The social and economic inequalities are the direct cause of such a divide, and those who cannot enjoy the benefits and advantages of technology, or who are identified as being in a low-IT literacy group are being marginalized from their counterparts who own, benefit, and profit from those technologies (Salt, 2005). Although Cheal (2009), O’Connor and Sakshaug (2009), and Sanchez (2009) noted that learners who are not technology-ready to operate SL are somehow resourceful to use alternative platforms, the digital divide remains the biggest hinder for individual users of any digital resource.

Second Life’s Affordances for Language Learning

Henderson, Huang, Grant, and Henderson (2012) have proposed several affordances of VWs for language acquisition. They are divided into eight categories: “affective filter” (p. 402); “persistent environments and records” (p. 402); “physical and linguistic co-presence” (p. 402); “avatar control and learner autonomy” (p. 402); “the value of text interactions, even in a virtual world experience” (pp. 402-403); “mediated environment” (p. 403); “context sensitive interactions” (p. 403); and “body language” (p. 403). They have suggested that VWs such as SL is particularly suitable for language learning and teaching as it engages and enhances individual learner’s self-efficacy. Self-efficacy is defined by Bandura and Schunk (1981) as “people’s judgment of their capabilities to organize and execute courses of action required to attain designated types of performances” (p. 31). Shakarami, Khajehe, and Hajhashemi (2013) coined the term *digital self-efficacy* to specifically illustrate how learners judge their capability in a digital (computer) learning environment. The affordances of one educational technology (e.g., SL) are the “characteristics of an artefact [...] that determine if and how a particular learning

behaviour could possibly be enacted within a given context” (Kirschner, 2002, p. 19). Mayrath, Traphagan, Jarmon, Trivedi, and Resta (2010) noted that the “multi-user, high graphical fidelity, multimodal nature of SL creates many affordances for teaching and learning” (p. 404). Therefore, one’s self-efficacy is predominantly affected by his/her level of manipulating these affordances (Shakarami et al., 2013).

Ziglari (2008) has emphasized that “language engagement occurs when the language knowledge of the learner interacts with the environment and this exposure-language offers ‘affordances’ which are learning opportunities to the learner” (pp. 376-377). Therefore, the need for evaluating learners’ actual performance, based on their perceived affordance of the learning environment, becomes the central focus of any instruction, in any provided learning environment. Kaplan-Rakowski (2010) pointed out that current research should focus more on SL’s affordances for foreign language education. Pellas and Kazanidis (2014a) concluded from the findings of their study that instructors and instructional designers should carefully consider the affordances of SL in order to effectively teach and design courses for SL learners.

Second Life and EFL/ESL Education

With the rapid development and advancement of internet and communication technology, and the affordability of personal digital devices like desktops and laptops, English education has shifted drastically from in-class activity to online/distance and eLearning models. Such a transformation emphasizes the significant role of those educational technologies that benefit both language instructors and learners by liberating the constraints of physical boundaries, insufficiency of instructional time and authentic resources. Ambient Insight (n.d.) reported that investment and spending on global digital (online) English language education market reached \$1.8 billion in 2013, and will reach \$3.1 billion by 2018. Among over 150 e-Learning content

suppliers, SL has earned unparalleled attention from researchers, educators and learners. Tusing and Berge (2010) summarized three major instructional advantages of SL over traditional in-class English learning. First, it maintains and strengthens learners' oral proficiency as achieved in the traditional classroom; second, it engages communication between non-native and native English speakers virtually and distantly; and third, such virtual connectedness enables learning to be realized without time and space constraints.

It is worth noting that many existing SL in-world language courses, projects, and programs are created and offered based on above-mentioned advantages and affordances. After a decade's development and criticism from researchers and practitioners of education at all levels, we may safely conclude that the educational potentials SL offers are positive and growing. SL as a typical learning VW has demonstrated its close connection with a constructivist approach in learning. This section examines the existing literature on how SL is utilized as an instructional venue for English teaching and learning.

Advantages of Utilizing SL in EFL/ESL Education

Overall, SL has several unique features that can benefit EFL/ESL learners, as Hismanoglu (2007) suggested:

Interactions: SL offers opportunities for social interactions among a group of people and their communities;

Visualization and contextualization: It provides users with playing and creating contents, sometimes unattainable in real life, because they are distant, costly, made-up or improbable to access;

It offers opportunities to recognize and learn about other cultures;
It makes immersion in 3D environment simple, having a strong impression of "being present";

Simulation: It provides playing contexts, sometimes hard to know in real life, considering them as an advantage for educational purposes. (p. 105)

These features coincide with what Darhower (2002) defined as “a learner-centered discourse community” (p. 249) that has unique advantages that traditional EFL/ESL education lacks (see Table 1). Schwienhorst (2002) summarized several advantages of VR (e.g., SL) in supporting constructivist language learning that:

As an interface, VR with its underlying spatial metaphors is a more natural way of organizing information resources than an interface that relies solely on the use of buttons and/or menu bars, providing a multimodal interface to resources supporting learning;

VR allows for greater self-awareness and encourages learners to experiment with different roles through the use of virtual representations, thereby reducing the affective filter;

VR can enhance conversation management and group work by allowing for collaboration in a variety of rapidly changing group work scenarios;

VR tools such as recording tools may go beyond face-to-face communication in the way they can enhance linguistic and cognitive awareness of the learning process, especially through the medium of writing;

VR supports interaction by locating participants in a shared environment, thus allowing for a common linguistic reference point;

Shared VR applications enable learners to collaborate on resources in real time; In VR, learners are encouraged and enabled to actively participate in the creation and organization of their learning environment (p. 205).

The literature review at this point, aimed to explore SL’s capacity and advantages for engaging English learners’ learning processes in a constructivist approach. This section reviews studies that focused on learner autonomy, collaboration, perception (e.g., attitudes and motivations), engagement for distance learning, and benefits for English practitioners and educators. All of these factors have direct impact on providing EFL/ESL learners an authentic learning environment that might enhance their learning outcomes.

Enhancement to English learners' attitudes and motivations. The importance of language learners' motivation, as Wehner, Gump, and Downey (2011) have indicated, is that it can "determine how and to what extent they acquire a language" (p. 278). Horwitz, Horwitz, and Cope (1986) coined the term *foreign language anxiety* (p. 125) to address the stressful situation often seen in classroom-based foreign language learning environments. They considered students' fear of negative evaluation from their instructors and peers to be the primary attribute that leads to such anxiety, and apprehension and embarrassment deepen such anxiety (Yu et al., 2013, p. 1155). These factors negatively affect learners' motivation in learning. Such phenomena are more obvious in Asian contexts, especially in China, as Liu and Jackson (2008) note from their study that Chinese EFL/ESL students "did not like to risk using/speaking English in Class" (p. 71), and they "felt anxious in their English language classrooms, and they feared being negatively evaluated and were apprehensive about public speaking and tests" (p. 71). Horwitz et al. (1986) suggested that, in order to minimize or eradicate anxiety in foreign language learning, learners should be situated in a non-threatening environment that is fun, confidence-oriented, and multiple learning style-enabled. In light of this concern, Grant, Huang, and Pasfield-Neofitou (2013) concluded from their comparative study of foreign language learning between real world classroom and SL that, the latter one was less stressful based on participants' perceptions. And such perception was not greatly affected by the technical related anxiety that usually occurs in technology-driven learning environments. Similar conclusions are also drawn from studies done by Balcikanli (2012), Chen (2012), Couto (2010), Wehner et al. (2011), and Yu et al. (2013). Specific to EFL/ESL education, Wang et al. (2009) noted in their study when Chinese EFL learners were technology-ready and optimistic, their motivation was also positively enhanced. They preferred incorporating SL into their normal EFL program. Wu

(2012) studied how Chinese EFL learners perceived SL as an educational tool for English learning. She interviewed several students who had more or less experiences learning English in SL, and most of them agreed that SL offered them a non-traditional environment that could enhance their motivations to learn more beyond their available resources, eventually helped them to become active learners. Kamali (2012) studied how 15 Turkish EFL students from one Turkish university utilized task-based activities in SL to oral improve their English proficiency. The findings reveal that, SL helped these students to minimize their anxiety of learning oral English by engaging their motivation and enhancing self-confidence toward speaking publically in the VLE of SL. In sum, language learners' attitude and motivation are two important factors (Oroujlou & Vahedi, 2011) and SL somehow could help develop learners' positive attitudes by increasing their motivation and self-efficacy, so their anxiety could be minimized or eliminated.

Engagement for learner autonomy and collaboration. Wang (2011) has claimed that high level language learners might not be those who are more intelligent but, instead, might be those who might actually be autonomous and independent thinkers. He suggested that “instant and informed decision making is a prerequisite for successful functioning, helping learners become autonomous is one way of maximizing their chances for success” (p. 273). In order to engage and increase a language learner’s autonomy, Dörnyei (1998) suggested that the focus of instruction should shift from what the teacher provides to what learners demand. In other words, the instruction ought to be learner-centered. However, learner autonomy does not mean it is “teacherless learning” (Thanasoulas, 2000, para. 10), as the ultimate goal for learner-centered instruction is that instructors help and lead learners toward self-access and self-directedness. P. Benson (2001) classified five types of practice that can foster language learners’ autonomy. One of them is a technology-based approach that highlights the use of educational technologies such

as networks, computers, and related applications. By incorporating these technologies, students are able to collaborate online (virtually) with each other on the same project, guided by their instructors to ensure the fulfillment and quality of designated tasks or projects.

Online collaboration as one of SL's noticeable benefits fosters negotiation for participants of diverse cultural backgrounds. Lee (2010) stated that, due to the cultural difference between Asian and western countries, collaborators behave in dramatically different ways. For instance, Asians tend to be inward and express their respect and thoughtfulness by being quiet, while students from western countries were encouraged to be more outward from a very young age and are much more vocal in expressing their ideas and opinions. Lee (2010) concluded that the consequence of these psychological differences is that "Asians first think then talk, in stark contrast to Westerners, who think by talking" (p. 390). Therefore, in face-to-face collaboration, if Asian students had less time preparing to think before they talk, the total effectiveness of collaboration would be substantially decreased. However, in VW where collaborators had no physical confrontation, Asian students were given ample time and ease to freely think and then express themselves. This is pedagogically significant and beneficial for Asian EFL/ESL learners because SL "is an environment that helps minimize their self-consciousness" (Lee, 2010, p. 40). A similar finding can also be seen in Thomas' (2010) study on Japanese college level English learners' collaboration in the VLE of SL.

Another contribution SL offers to learner autonomy is that it can engage cultural collaboration among learners of diverse cultural backgrounds via virtual interaction (Balcikanli, 2012; Jia et al., 2010). The virtual collaboration in SL offers "rich possibilities for real-time foreign language instruction in a 3D space" (Jia et al., 2010, p. 568) that allows learners to reflect between their own culture (C1) and the culture of the target language (C2). This serves to

enhance deeper comprehension of the target language since “language and culture are inseparable” (Balcikanli, 2012, p. 141). In addition, SL can “offer a rich potential to create tasks for the development of intercultural awareness” (Nocchi, 2011, p. 131) which is critical for language learning, because the lack of intercultural awareness often results in disruption of communication among learners of diverse cultural backgrounds. Zhang (2013) stated that SL is significant in engaging learners’ “culture-based communicative thinking” (p. 244).

Li, Wong, Gui, and Yeung (2013) studied how one university in Hong Kong designed and managed a virtual campus in SL to enhance undergraduate students’ competency in technical and web-based English writing. Students used personalized avatars to assess each other’s work, and received feedback from peers to help improve writing skills. The findings show that virtual learning in SL is more effective than traditional in-class and two dimensional online discussion activities because it offers various collaborative tasks that enhance students’ interest in the learning process. Yu, Song, Resta, Chiu, and Jang (2013) proposed from their study that SL could also be used for trans-national collaboration to learn authentic language with native speakers of the target language. They believed that, with more freedom from location and time restraints, the learners would become more autonomous. The studies done by Wang et al. (2009, 2011) also reflected the possibility of trans-national collaboration between English instructors and learners from a non-English speaking country.

SL’s elimination of “ceiling effect” and supplement to English distance learning.

Rifkin (2005) criticized the insufficiency of four-year university foreign language instruction that cannot prepare students to be capable to utilize the target language. He called this phenomenon a “ceiling effect” (p. 3) that is frequently seen in typical college-level foreign language curricula. Blasing (2010) suggested that SL could help eliminate this invisible ceiling by providing

“opportunities for extended, active, immersive practice time” (p. 9), and “opportunities for broad access to native speaker communities and a virtual space for collaboration and exchange” (p. 9).

Knutzen and Kennedy (2012) conducted a pilot study on the integration of virtual language learning facility in SL to teach English for students of Lingnan University in Hong Kong. The course was developed in partnership with Texas A&M University and taught by instructors from their TESOL program. The capacity of learning and teaching synchronously enabled instructors and learners to be embedded in a VLE beyond physical boundary between two geographically distant locations, and ultimately they formed a “global classroom” that was supplementary to students’ learning opportunities. The interactive communication with native English speakers increased their motivation to be more participatory in ways that might not be achieved in in-class scenarios lacking quality instructors and authentic resources.

Immensely impacted by globalization, today’s distance education is mostly based on the wider application of telecommunication in which the “teaching and learning events are distributed over time and place, occurring synchronously and asynchronously using different media” (Dabbagh & Benson, 2007, p. 191). SL “can be implemented as a tool for distance education” (Inman et al., 2010, p. 54) by supplementing the scarcity, insufficiency, and unavailability of local resources, with its abundant capacity of providing multimedia instruction, either synchronously or asynchronously. Multiple examples have been seen in the previous section of how SL engages distance learning, which also suggests its potential to be utilized as a supplement and enhancement to existing English distance education. This is because SL is equipped with qualified instructors and authentic learning materials in a relatively secure environment, to engage English non-native speakers who are often geographically distant and remote from English speaking countries and regions. Balcikanli (2012) conducted a study of

how Turkish and American students utilized SL as a distance learning tool to learn each other's languages. They applied voice chat to discuss topics like customs and habits that interested both groups. Study findings indicated that both groups expressed the feeling that SL helped them better acquire the knowledge they had expected, and learning occurred via authentic interaction between learners and the native speakers of the target language. SL also provides a venue for bridging cultural competence which is an indispensable element in language acquisition.

The VLE of SL is available to all registered users, with recurring sessions (if recorded for asynchronous learning) that can be accessed and reviewed unlimited times even when the class session has ended. This feature is distinctively more beneficial than traditional in-class learning. Distance learning also makes individual learning life-long and mobile, and this is critical for geographically distant language learners since their primary motive and purpose for learning language is not degree-driven. Therefore, the desire and goal of pursuing degrees from a "brick and mortar" institution is not applicable here.

SL for TESOL teacher development. Not only can SL enhance language learners' English proficiency, but also it offers alternative and extended opportunities for TESOL practitioners and students' professional development. The University of Leicester (n. d.) incorporated SL into its distance program of MA in Applied Linguistic and TESOL. Case study results indicated that "SL enabled the students to apply theory in a practical setting and encouraged them to consider issues in applying SL to their own teaching contexts" (para. 1). Antoniadou (2011) studied a transatlantic collaboration between Spanish students in a TESOL program and their mentors from the USA. Although they encountered several technical and personal issues, the overall feedback was positive, and students considered SL an applicable tool for their future teaching. Lybeck, Bruhn, and Feyissa (2012) found out that SL could be used for

peer teaching which is quite beneficial for TESL students since SL simulates interaction between students that enables them to reflect their teaching based on feedback from their peers. In addition to post-secondary settings, Blankenship (2010) also explored SL's potential for pre-service ESOL teachers' professional development. In her project, Blankenship used the video conferencing software Skype to help communicate with participants. She found out that, although individual participants had different attitudes toward utilizing SL, the overall feedback was positive and SL increased participants' "self-regulation and pedagogic transformations" (p. xiii) from conventional in-class instruction to technology-oriented teaching, which also complied with national standards for using educational technology in foreign language teaching. Liu (2000) suggested that, as TESOL students, a multiple-site practicum offers them "a better appreciation for need analysis" (p. 19); "a firsthand understanding that ESL teaching must be student- and context- dependent" (p. 19); and "a valuable cultural experience" (p. 19). SL as a micro-society provides a platform in addition to the traditional practicum site. Research and practice done in SL should be encouraged as it is a new direction in the field of computer-assisted language learning (Cooke-Plagwitz, 2008). Xu, Yeh, Dieu, Lee, Cao, González, Arena, and Johnson (2010) have emphasized that EFL/ESL professionals should be better equipped with knowledge for teaching in non-traditional environments that demand the use of novice technology-driven teaching applications, in order to be better prepared for serving the *Net Generation*.

Bridging the "Missing Gap": The Future of EFL/ESL Education in SL

In addition to those drawbacks identified in the previous section, what mostly affects EFL/ESL learners and instructors from successfully utilizing SL include two factors: technical issues and support (Aldosemani, 2014; Antoniadou, 2011; Cooke-Plagwitz, 2008; Gowans,

2011; Li et al., 2013; Liou, 2012; Peterson, 2010; Siribaddana, 2011; Zhang, 2013) and the degree of complexity, familiarity, and appropriateness of task design toward SL's unique mechanism for language learning (Deutschmann, Panichi, & Molka-Danielsson, 2009; Grant & Clerehan, 2011; Hundsberger, 2009; Ishizuka & Akama, 2011; Jauregi & Canto, 2012; Jauregi, Canto, de Graaff, Koenraad, & Moonen, 2011; Jee, 2010; Jee, 2014; Liou, 2012; Mayrath et al., 2007; Mayrath et al., 2011; Milton, Jonsen, Hirst, & Lindenburn, 2012; Molka-Danielsen, Richardson, Deutschmann, & Carter, 2007; Mount et al., 2009; Peterson, 2010; Peterson, 2012; Thomas, 2010; Wang et al., 2009; Wang et al., 2011; Wang, Calandra, Hibbard, & McDowell, 2012; Wigham & Chanier, 2013). Despite these two major factors, some empirical studies have supported the position that, the VLE of SL can be an instructionally applicable venue, either as supplement or an alternative to traditional in-class EFL/ESL teaching and learning. Table 5 is a comparative summary of those empirical studies. This hopefully helps to identify what has been achieved and what needs further study.

Table 5

Empirical Studies of Teaching and Learning EFL/ESL in SL

Empirical Studies	Projects (Courses) and Participants	Research Method	Findings/Conclusions	Recommendations for Future Study
Molka-Danielsen et al. (2007)	<i>Social English for Doctoral Students</i> Participants were PhD students and faculty from Norway, Sweden, Italy, Estonia, and USA.	Qualitative (unstructured, reflective interview & observation)	SL mimicked real world that can help non-native English speakers develop English language skills in a social-constructivist approach, due to SL's capability of providing opportunity for experiential learning.	More research is needed to focus on English learning in a contextualized manner with learners of diverse social and cultural backgrounds.
Deutschman et al. (2009)	<i>Social English for Doctoral Students</i> <i>Oral Competence for Doctoral Students</i> Participants were 13 doctoral students from Australia, Estonia, Italy, Malta, Norway, Sweden; and 5 teachers from Australia and Britain.	Qualitative (survey, group evaluation, personal interview, & observation)	SL engaged more oral participation among learners, due to the authentic communication in English with native speakers.	Multimodal usage of SL needs to be explored to better utilize SL for English learning in order to develop learners' professional needs.
Deutschman & Panichi (2009)	<i>Oral Competence for Doctoral Students</i> Participants were 7 doctoral students with various disciplines and from Australia, Italy, Malta, Spain, Sweden, Russia, and two teachers with dual citizenship of Italy/Australia and Sweden/Britain.	Mixed: Qualitative (observation) Quantitative (statistical description)	In-world signaling reflected learners' behavior in VW, which also provides important reference for teachers to better facilitate instruction.	Research on learners' pragmatic adaptation of SL for English learning needs to be addressed.
Pereira (2009)	<i>Language Learning Quests</i> Study recruited four participants with age range between 13 and 15.	Qualitative (interview & observation)	Purposefully designed game-like tasks in SL helped learners develop 4 basic skills (listening, speaking, reading, and writing) for English acquisition.	Fundamental skills in English learning should be integrated in SL to make language learning more communicative and pragmatic-oriented.
Wang et al. (2009)	Participants were 20 undergraduate students from the USA who enrolled in a required course <i>IT 2010: Computer Skills for Information Age</i> , and 61 full time sophomores who majored in English in the School of Foreign	Mixed: Qualitative (survey, interview, observation, & document review)	Chinese students' readiness for technology ensured their positive attitude and willingness to incorporate SL into their existing EFL program.	Future study should focus on engaging students' goals with interactions in the authentic tasks in order to make English learning more meaningful.

Empirical Studies	Projects (Courses) and Participants	Research Method	Findings/Conclusions	Recommendations for Future Study
	Languages at one university in China.	Quantitative (statistical analysis)		
Jee (2010)	Participants were 34 ESL learners who enrolled in the ESL Services at one southwestern university in the U.S.A, age ranged from 16 to 44.	Qualitative (survey, interview, & observation)	Design of pedagogically appropriate tasks in SL engaged earners' interaction with peers and instructor.	Future research on using SL for various content areas should be considered.
Peterson (2010)	Participants were 7 intermediate level EFL learners from China and Japan, with age range between 22 and 44.	Qualitative (observation, field note, pre- & post-study survey, & interview)	Task-based interaction among learners elicited considerable language outcomes while their positive attitudes toward learning were also simultaneously enhanced.	Future study needs to focus on how interaction can be fostered at work rather than general context.
Thomas (2010)	<i>Computers and Communication</i> Participants were 25 junior and senior undergraduate students from one Japanese university, they majored in English with lower intermediate level proficiency.	Qualitative (case study: observation, field note, informal interview, & video recording)	Task-based instructional design in the authentic learning environment of SL gave learners ample opportunity to collaborate and immerse in order to achieve academic goals.	Collaboration in SL should be more meaningful, rather than simply completing the designated tasks. Future research calls for focus on SL's pragmatic use for English learning.
Gowans (2011)	<i>Global Imaginarium</i> Participants were 32 EFL learners of upper-intermediate and advanced levels of English proficiency.	Qualitative (exploratory case study: observation)	Participants were able to utilize communication strategy in SL in order to fulfill the conversation tasks, with teacher facilitation and continuous support.	"further research needs to be conducted with focus on interactions between, culturally diverse L2 learners, as well as potential of SL for language teaching and learning" (p. 45).
Wang et al. (2011)	<i>SL_EFL Program</i> Participants were two male and two female Americans and 29 full-time sophomores who majored in English from one Chinese university.	Qualitative (case study: survey, interview, & protocol)	American student teachers collaborated with Chinese EFL students to help them better acquire the four basic language domains (listening, speaking, reading, and writing).	SL as an instructional tool should be equipped with clearly defined objectives, curriculum, and resources, so that English learners would be able to have more opportunities to learn beyond the basic language domains.
Xu, Park, & Baek (2011)	Sixty-four undergraduate students from South Korea were recruited, their ages ranged from 20 to 22.	Quantitative (quasi-experimental analysis)	Digital story-telling created by students in SL increased more self-efficacy and flow than those who were done offline (using Windows Movie Maker).	Using digital storytelling in SL to teach English should encompass what the society demands. Therefore, future study on the use of such pedagogy needs to be more practical.

Empirical Studies	Projects (Courses) and Participants	Research Method	Findings/Conclusions	Recommendations for Future Study
Balcikanli (2012)	Participants were 7 American college students who studied Turkish in the USA and 8 Turkish EFL learners who studied English in Turkey.	Qualitative (interview & observation)	EFL learners were able to interact and communicate with native speakers of target language in an authentic environment that used to be often unavailable in conventional classroom.	Research can be extended to further develop learner's autonomous skills gained in SL to satisfy their respective learning objectives and goals.
Kamali (2012)	Participants were 15 Turkish upper-intermediate level preparatory class students of Middle East Technical University (METU)	Qualitative (case study: questionnaire & interview)	Task-based language learning activities in SL helped students overcome language anxiety in order to improve their English oral proficiency. Their motivations and self-confidence were enhanced via the oral communication among avatars.	Future study can shift from "lifelike contexts" (p. 134) to "argumentative topics or academic subjects" (p. 134).
Kastoudi (2012)	Four adult advanced-level ESL learners and one English native speaking teacher participated in the study.	Qualitative (case study: observation)	Negotiation of meaning and interaction in SL enabled participants acquire more vocabulary.	Research on virtual quests in SL should be conducted beyond single aspect of language acquisition (e.g., vocabulary).
Knutzen & Kennedy (2012)	<i>Global Classroom Project</i> The project involved 200 participants from Lingnan University of Hong Kong who were ESL learners, and TESOL program students from Texas A&M University.	Qualitative (observation & online discussion)	Global classroom created in SL enabled ESL learners interact with native English speakers beyond time and space restraints, such immersive learning environment made interpersonal communication more effective and authentic.	Besides purely language learning in SL, "further integration with instruction should include participatory theatre/immersive learning projects with History, Academic English, Management,Sociology, and Philosophy courses" (p. 100).
Liou (2012)	Participants were 25 undergraduate students from one university in Taiwan.	Qualitative (survey, interview, & observation)	Design of four tasks in SL offered EFL learners ample opportunity to communicate and collaborate in an authentic environment	More research on sense-making learning in SL should be explored.
Milton et al. (2012)	<i>Vill@ge Project</i> College level students (aged between 20 and 25) from Swansea University (UK) and Szeged University (Hungary) participated in the project.	Qualitative (observation)	Volume of English words produced in the VLE of SL greatly increased when EFL learners had opportunity communicating with native English speakers.	Subsequent research needs to focus on how learners' lexical competency can be used for specific subject or real life experience.

Empirical Studies	Projects (Courses) and Participants	Research Method	Findings/Conclusions	Recommendations for Future Study
Peterson (2012)	Participants were 8 Japanese college students aged between 19 and 23.	Qualitative (survey, interview, & observation)	SL provided a “stimulating environment for learners to undertake a range of beneficial forms of social interaction involving collaborative dialogue in the” (p. 37) target language so that learner’s autonomy and learning outcomes were both ensured and enhanced.	Future research should pay attention to how English language development in SL can be fostered in a specific context other than a generally communicative environment.
Wang et al. (2012)	<i>SL_EFL Program</i> Participants were from one Chinese university and one American university in the southeastern United States	Mixed: Qualitative (observation) Quantitative (quasi-experimental: A. pre-test: language test, B. posttest: language test, blog, survey, interview)	SL provided “a richer social and cultural experience for EFL students” (p. 959), and “students was highly motivating and effective in facilitating EFL learning” (p. 959).	N/A
Wang & Shao (2012)*	A group of 39 freshmen from Zhejiang International Studies University (China) was recruited for the study.	Qualitative (observation)	Without actually signing up for SL, SL still could be utilized to help students “learn and practice listening comprehension, translation skills, and new English words” (p. 16).	More applicable potentials of SL for ESL/EFL learning should be further developed.
Wu (2012)*	Study recruited several Chinese SL residents who were also affiliated with a bulletin board system (BBS) called <i>China's SL Union</i> .	Qualitative (interview & observation)	Chinese SL residents were able to utilize SL together with SL-themed BBS and friend group to be actively engaged in English learning	More research is needed to look into how learners’ cultural factors and actual demands can be incorporated with SL instruction.
Chung (2012)	Participants were first year college students from Taiwan.	Qualitative (interview & observation)	Students were able to utilize SL as an authentic learning environment to practice common workplace language.	Future research should look into how SL can be implemented for learning and teaching professional English.
Li et al. (2013)	<i>English for Technical & Web-Based Writing</i>	Qualitative (survey &	SL engaged more collaboration among learners. This also benefited their writing	SL’s potential of extending “professional knowledge and life skills

Empirical Studies	Projects (Courses) and Participants	Research Method	Findings/Conclusions	Recommendations for Future Study
	Undergraduate students from a university in Hong Kong participated in the study.	observation)	since more peer review and self-reflection were simultaneously engaged.	for all-rounded development” (p. 343) should be further concerned.
Wigham & Chanier (2013)	<i>ARCHI21 Project</i> Participants were 17 students ranged from undergraduate to master level, and aged between 21 and 25. Their mother tongues included French, Spanish, Chinese, Italian, Korean, and Arabic.	Qualitative (survey, interview, & observation)	Both verbal and nonverbal modes of communication created in SL helped learners generate more language input and output.	The affordances of non-verbal communication in SL need to be further explored, and instructor should seek the use of SL as a synthetic world environment.
Yu et al. (2013)	Total of 94 university students from Taiwan (48) and Japan (46) joined in the study.	Qualitative (survey, interview, & observation)	Students were motivated to engage more oral competency while their learning anxiety decreased via communicative collaboration in SL.	N/A
Zhang (2013)	Participants were 10 business-related majors graduate students from one university in North China.	Exploratory qualitative (semi-structured interview & observation)	Some pedagogical affordances and challenges of teaching spoken English in SL were identified. This includes linguistic, technical, and instructor factors.	Future study could focus on ESL learners from non-English speaking countries like China and Japan with various backgrounds.
Aldosemani (2014)	Participants were one female and five male ELL students from Saudi Arabia who enrolled in English class through International Students program, and four native English speakers from U.S.A.	Qualitative (case study: interviews, documentation)	Saudi ELL participants “indicated they gained cultural knowledge and understanding after their interaction with American native speakers through SL” (p. 132), and SL “experience could improve their [English] linguistic skills” (p. 132)	Future study should focus on acknowledging ELLs’ actual needs and goals beyond simply linguistic skills.
Chen (2014)	“Nine adult EFL learners worldwide were recruited” (p. 48).	Mixed: Qualitative (survey, documentation, interview, observation) Quantitative (“participants’ pre- and post-task-based	“Students in this study perceived SL as a potentially effective platform to empower their [English] language learning” (p. 50), due to the task-based interaction they were privileged in SL.	N/A

<u>Empirical Studies</u>	Projects (Courses) and Participants	Research Method	Findings/Conclusions	Recommendations for Future Study
Jee (2014)	<p><i>Speaking and Listening</i> Participants were 21 high-intermediate level and 13 low-intermediate level ESL students from one ESL institute in the USA (22 were female and 12 were male).</p>	interaction" [p. 49]) Qualitative (observation)	Authentic task design like Jigsaw and Decision-making enabled learners elicit more negotiation of meaning during communication with instructor and among peers.	Future research needs to focus on content of the task and learners' level of proficiency when implementing these tasks in SL. And task design should be more real life-oriented.

Note. Studies are listed in chronological order. *Studies did not involve actual in-world instruction.

Table 5 indicates that existing studies have placed a great emphasis on exploring the preliminary phase of English learning, which is the acquisition of four basic skills and partial development of their linguistic integration. However, rarely have these studies concerned themselves with the pragmatic use (e.g., academic and professional) of English acquisition for non-native English speakers. Based on these studies, it is recommended that future research in the field needs to be more specific and pragmatic-oriented. In other words, the research focus should shift from teaching and learning general English to ESP in SL (Aldosemani, 2014; Balcikanli, 2012; Chung, 2012; Deutschmannet al., 2009; Deutschmann & Panichi, 2009; Jee, 2010; Jee, 2014; Kamali, 2012; Knutzen & Kennedy, 2012; Li et al., 2012; Milton et al., 2012; Pereira, 2009; Peterson, 2010; Peterson, 2012; Thomas, 2010; Wang et al., 2009, Wang et al., 2011; Xu et al., 2011). The following section discusses such focus based on historical, social, and technological attributes in the development of EFL/ESL education.

Learning English for Specific Purposes (ESP): A Globalized Demand and Trend in EFL/ESL Education

According to the British Council (2006), one in four people in the world speak English at a certain level, and among them are 375 million EFL/ESL speakers. The National Clearinghouse for English Language Acquisition (NCELA) (2011) reported that the number of English language learners (ELLs) enrolled in American public schools has increased from 3.5 million (in 1997-1998) to 5.3 million (in 2008-2009), due to the overwhelming Hispanic population and non-English speaking immigrants from all over the world. The British Council (2006) indicated that English speaking countries like the USA, UK, Canada, New Zealand, and Australia remain the preferred destinations for non-native English speakers to study English, because authentic resources, quality instructors, and immersive language environments are more readily available

to students who study English in their home countries. Many of those who came to English speaking countries had the goals of learning English as a language while applying for college admission based on their English performance. Therefore, English competency is seen one of the most influential prerequisites in order to be admitted to and succeed in one's academic path (English for academic purposes).

It is clear that a closer and more in-depth cooperation is occurring between the two hemispheres, in just about every aspect of social life. This development has stimulated the process of globalization in a steady and faster pace. The concept of globalization is described by Dabbagh and Benson (2007) as a “psychological phenomenon that can be applied to many contexts to imply that most people are connected simultaneously with distant events, directly or indirectly, intentionally or unintentionally, promoting a perception or an awareness of the globe as a single environment” (pp. 189-190). As the consequence of globalization, today’s EFL/ESL education has transformed dramatically from purely education-oriented to market-led industry in recent years. English as the global language serves the role of minimizing communicative obstacles and ineffectiveness among those who speak different languages, and between English native speakers and non-native speakers. Kaur (2010) noted that “English is increasingly becoming the chosen medium to facilitate communication among people of diverse linguistic and cultural backgrounds” (p. 192). The popularity and predominance of English has secured its significant role as a global language and English proficiency is often a decisive factor in one's success in academic, professional, and personal life. Harmer (1991) stated that “people want to study English because it offers a chance for advancement in their professional lives” (pp. 1-2).

However, as Belcher (2004) pointed out, the current EFL/ESL education in non-English speaking regions such as Asia, Africa, and parts of Europe only favors teaching English for

general purposes. In other words, teaching and learning English are for the purpose of acquiring the language with maximum expectation of maintaining the four basic skills (writing, reading, listening, and oral). When English becomes the only language for communication, non-native English speakers can at least converse in English, but, English under EFL/ESL curricula is still taught at its primitive linguistic level. Although some college courses are taught in English, Beckett and Li (2010) criticized its “shallow content teaching” (p. 47). Pennycook (1997) suggested that functional literacy (of a target language) and communicative competency of language learners should not be removed from academic, personal, and professional contexts. In that sense, current English learning in those regions tends to be “purposeless,” meaning that English is taught as an independent subject without immersing it in or embracing it with other disciplines. It is under such a background that some researchers (Adamson, 2006; Benabdallah, 2012; Chen, 2004; Wiwczroski, Silye, & Tar, 2005) have advocated a shift of focus toward research and teaching from general English to ESP education. According to Mackay (1978), ESP is taught “not as an end in itself but as an essential means to a clearly definable goal” (p. 28), and Hutchinson and Waters (1987) consider ESP as a teaching approach “in which all decisions as to content and method are based on the learner's reason for learning” (p. 19). Those notions distinguish ESP from traditional EFL/ESL education, which is teacher-centered, and the ESP course/program in its origin and purpose is also distinguished from what has been taught in general English environments, Robinson (1980) wrote,

An ESP course is purposeful and is aimed at the successful performance of occupational or educational roles. It is based on a rigorous analysis of students' needs and should be “tailor-made.” Any ESP course may differ from another in its selection of skills, topics, situations and functions and also language. It is likely to be of limited duration. Students are more often adults but not necessarily so, and may be at any level of competence in the language: beginner, post-beginner, intermediate, etc. Students may take part in their ESP course before embarking on their occupational or educational role, or they may combine their study of English with performance of their role, or they may already be competent

in their occupation or discipline but may desire to perform their role in English as well as in their first language. (pp. 13-14)

An early concept of ESP was proposed by Halliday, McIntosh, and Strevens (1964) as a suggestion that there should be a focus particularly on communicative needs of English and corresponding practice for those professional groups. Widdowson (1978) also suggested that the research focus on English education should shift from a traditional linguistic-oriented to real life communication. Such advocacy is related to two historical turning points (Hutchinson & Waters, 1987). First, the post-WWII era stimulated the USA with an “enormous and unprecedented expansion in scientific, technical and economic activity on an international scale” (p.6), and such expansion assured that the USA would surpass the rest of the world and established its powerful influence on other countries, from every aspect of the social life, including the use of English. The other factor is the 1970s energy crisis that influenced a transition of social value and ideology from those English-speaking countries to oil-abundant non-English speaking regions (e.g., Middle East and Southeast Asia).

Gatehouse (2001) listed three major reasons from English learners’ perspective that have resulted in the emergence of focus on ESP in English education: learners’ needs have become a priority; a linguistics revolution has evolved the research of language learning for real communication; and the learner-centered learning model has demanded for different strategies. Hyland (2007) suggested that the traditional materials EFL/ESL learners used to learn with “were often based solely on the lexical and grammatical characteristics of scientific and business discourses in isolation from their social contexts” (p. 386), and this has resulted in a disconnection between what they have learned and what they could apply for in real life, because “these materials have largely been replaced by those that acknowledge wider interactional and semiotic contexts, where language and tasks are more closely related to the situations in which

they are used” (p.386). In sum, we might say that “language learning is language use” (Ellis, as cited in Schwienhors, 2009, p. 153).

Aviation-Related English Learning: A Typical ESP Case

Carter (1983, p. 131) categorized three types of ESP in general: English as restricted language, English for academic and occupational purposes, and English with specific topics. The first one focuses on learners’ particular roles in using the language. In other words, the restricted language is only used among certain people with defined professions and contexts. The second type is mostly seen in academic settings where students use English as a medium to learn other content knowledge and skills, especially where such courses or programs are better taught in English. The final one shifts the purpose toward topics in which English is used situationally, such as nonnative English speakers participating in an international conference, or multinational scientists jointly working on a project, where they must communicate and cooperate in one language.

Aviation-related English can be seen as covering all these three types. First, there is English used for communication between pilot and air-traffic controller (ATC). Such communication is only effective in a pre-determined situation and it becomes incomunicable when used outside the professional environment (Mackay, 1978). Second, English for flight attendants can be considered as English for occupational purposes, as those who are trained to become future flight attendants are prepared to use English as a communicative medium in serving both domestic and international airlines. For the first two types of ESP, the International Civil Aviation Organization (ICAO) (2005) requires all flight crew members and air traffic controllers who are involved in international traffic (not limited to English speaking countries and regions) to prove their English proficiency. An ICAO Rating Scale is used to evaluate their

performances. Finally, English used in lectures for air safety or pilot training is considered as a specific topic since knowledge in these areas was originally written and presented in English and in order to better comprehend and acquire them, non-native English learners need to use English for more accurate and effective learning outcomes.

Learning beyond Language: The Nature of English for Specific Purposes

The previous literature review indicates that many existing studies about English language teaching and learning in SL were conducted for the purpose of exploring its pedagogical implication in a general or purely linguistic manner. It is more about language acquisition other than its pragmatic use in a systematic way such as information sharing, communication, utilization, and reproduction. Bardovi-Harlig and Mahan-Taylor (2003) pointed out that traditional EFL/ESL education overemphasizes the learner's linguistic competence and is quite insufficient for developing the communicative competence of the target language. Stevens (2006) suggested that SL represents much of the future trend in learning foreign language with technology. Von der Emde, Schneider, and Kotter (2001) have summarized five characteristics of VWs like SL that can benefit for authentic foreign language learning by enabling "natural communication and content" (p. 213), "autonomous learning and peer teaching in a student-centered classroom" (p. 215), "individualized learning" (p. 218), "experimentation and play" (p. 218), and "students as researchers" (p. 219).

The nature of ESP education suggests that the acquired language should be used for mastering various skills and/or gaining experience for learners' specific goals (e.g., personal, academic/educational, and professional) that are usually unavailable or inaccessible in their native (first) language. In order to realize this goal, learners should obtain sufficient content knowledge via learning the target language. Historically, CBI can be implemented to enhance

ESP learning. As Grabe and Stoller (1997) pointed out, “early versions of content-based instruction (CBI) were used in English for Specific Purposes (ESP) programs” (p. 5). They also noted that “ESP curricula...have been designed to teach specific content and language skills to students and professional employees ranging from engineering and medical students to lawyers, business executives, airline mechanics, bank tellers, and hotel employees” (p. 15). According to Stoller (1997), one of CBI’s most prominent and important benefits is its capacity to enhance the natural teaching of the four basic language skills (reading, writing, speaking, and listening) in an integral and pragmatic way. Putnam (1983) has emphasized that language should not be taught for the purpose of solely mastering the language because “languages are typically taught at many levels within the educational system for widely varying reasons” (p. 34). In other words, language learning holds dual roles in its social and cultural developments. It is not only for purely linguistic distinction and understanding between source and target languages, but, rather, it functions as a medium for inter-language communication. Met (1999) stated that CBI “programs, models, and approaches have proliferated at all levels of instruction, from elementary schools through postsecondary levels, bringing with them a diverse nomenclature to identify instructional settings where language and content are integrated” (para. 1).

What distinguishes CBI from other language instructions is that its primary focus is on learner’s own language proficiency, prior educational background, existing learning experience, and short- and long-term goals. By considering those essential factors that greatly impact learners’ learning outcomes, CBI privileges learners with autonomy and opportunity in self-reflection and peer-review. This is in light of Krishan’s (1985) “*i+1*” *Input Hypothesis*. This hypothesis considers second language acquisition as the consequence of learners being exposed to the target language with certain amount of input (*i*) with construction on vocabulary, grammar

and all other essential language elements that are slightly beyond their current level (i+1). This input is made clear to students by creating a context that supports its meaning. Therefore, a second language is most successfully acquired when instructions are content-based. The learning conditions occur when: the focus of second language instruction is on meaning rather than on form; the language input is at or just above the proficiency of the learner; and there is sufficient opportunity to engage in meaningful use of that language in a relatively anxiety-free environment. Only a content-based environment seems to satisfy all abovementioned conditions. Tarnopolsky (2012) defined what CBI should look like and particularly addresses its close relation to the realization and enhancement of ESP learning,

Content-based instruction is the integration of content from the subjects of students' majors with the goals of target language teaching. It ensures parallel acquisition of knowledge from certain non-linguistic disciplines together with acquisition of the target language and the skills of communicating in it. In such instruction, the ESP curriculum is most closely linked or even based on the curricula of one or several of students' majoring disciplines so that learning the target language content follows the requirements of learning some professional content from the majoring disciplines through the medium of the target language. The development of students' target language communication skills proceeds mostly subconsciously through their teaming in the target language the content matter from the majoring subjects. In this way, content-based instruction eliminates the gap between language learning and learning professional subjects ensuring students' learning the latter through the medium of the former. (pp. 73-74)

From the above analysis, Tarnopolsky (2012) concluded that CBI, as one of two constituents in realizing a constructivist ESP learning, is "responsible for the selection of materials for the teaching/learning process" (p. 79). Moreover, Richards and Rodgers (2006) have claimed that CBI is supported by three major characteristics of language acquisition, "language is text and discourse-based" (p. 208), "language use draws on integrated skills" (p. 208); and "language is purposeful" (p. 208). Brinton Snow, and Wesche (2003) also noted that CBI is, in fact, fundamentally theme-based, and individual CBI can be tailored according to learners' specific needs and purposes. Also, the complexity of the instruction and degree and scope of the

knowledge and skills covered are dependent on both parties (instructor vs. learners). It has transformed from the traditional “one size fits all” instruction that rarely takes adequate consideration from learners’ perspectives such as individual need.

Moreover, CBI is not an isolated language instruction but can be implemented into daily class activities as either supplementary or as an independent element to existing curricula. Wesche and Skehan (2002) noted that students who obtain higher levels of language proficiency are those who are instructed in content-based models. They are exposed to different academic disciplines across campus. They have tried their best to understand and appreciate other cultures and they communicate in multiple languages. They are willing to connect with others and participate in activities among multilingual and cultural communities. Curtain and Pesola (1994) stated that “in content-related instruction, the foreign language teacher uses concepts from the regular curriculum to enrich the program with academic content” (p. 35). This is the central objective for CBI, and “the curriculum content is chosen to provide a vehicle for language learning and to reinforce the academic skills needed by the students” (p. 35). CBI at this point essentially meets ESP’s learning goals.

Ngan (2011) studied how CBI was implemented to teach accounting in English to Vietnamese college students. In the designed CBI class, accounting knowledge was delivered and presented in English. Students learned accounting knowledge by first acknowledging the English that conveyed the knowledge. The material provided in CBI was authentic, meaning it was directly used in native language instruction. In order to engage student learning, the instructor actively manipulated the instruction. The findings and evaluation indicate that students showed greater motivation in learning both language and content knowledge, that their

linguistic competency was improved, and that 92% of the total participants admitted they had learned something useful beyond language, per se.

Implementing CBI for ESP

CBI as syllabus/lesson plan. Eskey (1997) has suggested that CBI can be considered as syllabus in supporting ESP learning. He noted,

The content-based syllabus is best viewed as an even newer attempt to extend and develop our conception of what a syllabus for a second-language course should comprise, including a concern with language form and language function, as well as a crucial third dimension—the factual and conceptual content of such courses. (p. 135)

Grabe and Stoller (1997) also indicated that CBI allows greater flexibility and adaptability to be built into the curricular and activity sequences. In other words, in accordance with a syllabus, CBI can be customized to fit specific needs of particular group of students or individual learners in the form of CBI-based lesson plans and/or curricular. This is another benefit CBI contributes to ESP education. A tertiary level CBI lesson plan can be seen from McDorman's (n. d.) design of *Introduction to the Florida Court System*, which is also a typical ESP-oriented CBI lesson plan that focuses on English for legal purposes.

Sheltered instruction model. CBI is specified in several models, which, according to Brinton (2013), are “theme-based, sheltered, and adjunct” (p. 900). Theme-based and adjunct instructions focus more on learners’ linguistic competency, and the sheltered mode, as Dueñas (2009) has suggested, is an appropriate CBI approach for ESP learning since the overall goal of such instruction is to facilitate content learning rather than language acquisition. In the sheltered model, a “course is taught in a second language by a content specialist to a group of learners who have been segregated or ‘sheltered’ from native speakers” (Brinton et al., 2003, p. 15). Specific to ESP, such a model is delivered as “field-specific courses taught by teachers in the disciplines using English as the language of instruction” (Butler-Pascoe, 2009, p. 2). This model is

particularly applicable for ESP learners who are restrained in non-target language speaking environments such as their home countries. As Knight (2010) noted, beginning ESP learners are usually those “who are in the process of developing expertise in their fields need English communication skills as tools in their training” (p. 120). This includes non-native English speakers at the college undergraduate level who majored in computer science, business, engineering, and aviation.

One typical example of sheltered mode CBI can be seen from the study done by Wei (2005) on how American college students learned Japanese business and current affairs via the learning of the Japanese language. American students who studied under a sheltered model were instructed by a Japanese native speaker who specialized in the business major, and the study survey shows their motivation was engaged and raised as they were confidently learning both Japanese language and business and affairs. Another example is from Chapple’s (1998) study of how Hong Kong college students used English as the instructional medium to learn in a film course. The study findings indicated that students gained considerable knowledge in both language and film while they found the learning process to be enjoyable and engaging.

Technology and ESP Education

McDonald (1997) suggested that, with the rapid development and advancement in new technologies like network and digital devices, more institutions are equipped with full access to online resources and personal computers for educational purposes. English education has shifted drastically from in-class activity to online/distance and eLearning models that emphasize the benefits of those educational technologies for both language instructors and learners by liberating the constraints of physical boundaries, insufficiency of instructional time, and authentic resources.

Educational technology involving the use of computers, network, and databases is highlighted because this technology can be better utilized to provide learners with contextualized meaningful learning materials and resources in an interactive and experiential environment.

Butler-Pascoe (2009) recommended that technologies can also be applied in the ESP classroom because it affords several advantages for ESP learners:

1. Provides interaction and communicative activities representative of specific professional or academic environments;
2. Fosters understanding of the socio-cultural aspects of the language as practiced in various fields and professions;
3. Provides comprehensible field-specific input and facilitates student production;
4. Provides sheltering strategies for language development and content-specific understanding (modeling, bridging to students' background experiences; contextualizing, metacognitive activities, etc.);
5. Utilizes task-based and inquiry-based strategies reflective of tasks in discipline-specific settings and situations;
6. Utilizes authentic materials from specific disciplines and occupations;
7. Supplies authentic audiences including outside experts in specific fields;
8. Supports cognitive abilities and critical thinking skills required in the disciplines;
9. Utilizes collaborative learning;
10. Facilitates focused practice for development of reading, writing, listening, and speaking skills across the curriculum and disciplines;
11. Is student-centered and addresses specific needs of students;
12. Uses multiple modalities to support different learning styles;
13. Meets affective needs of students: motivation, self-esteem, and autonomy; and
14. Provides appropriate feedback and assessment of content knowledge and English skills. (pp. 2-3)

There are limited empirical studies exploring how technology can be implemented to engage ESP learning and teaching. González (2005) incorporated CBI into a blended learning mode that included online and face-to-face settings to teach students architectural knowledge in English. She provided students authentic materials and grouped individual students to better collaborate in order to ensure higher order thinking. In addition to these strategies, she implemented Moodle and Yahoo Messenger to engage peer communication. Moreover, due to the nature of architecture courses in which students needed more opportunity to design and sketch the prototype and blueprint, González also utilized Groupboard, a collaborative whiteboard that enabled individual students to work together on the same drawing project. Although several applications were applied, the use of multiple modalities in a non-integrated way caused both instructor and students to be less effectively involved in the learning and teaching activities designed in a blended way, and the inconsistency between face-to-face and online sessions hindered the learning continuum.

Similarly, in Susser's (2006) study, Japanese undergraduate students were taught a tourism course in English, and the instructor utilized several web-based applications like websites, emails, and discussion boards, together with word processors to help students to better acquire the knowledge necessary for achieving the course objectives. The overall outcomes turned to be positive, but the distribution of those applications varied according to the individual student's capacity of utilizing these applications. The instructor's role as facilitator became less controllable and therefore individual learner's effectiveness varied.

Hadjiconstantinou and Yerou (2012) also studied some instructional technologies (IT) that have been used for ESP teaching and learning, including online self-authoring tools like wikis and blogs; social network sites like Facebook and Twitter; and learning management

system like Moodle. Their findings show an overall acceptance and willingness for using IT for students' ESP learning. However, the instructional tools applied in the study were mostly text-based that had not been fully integrated with other forms of communication to better engage learners in a holistic and systematic way. Hence their design of such an IT-oriented ESP course was only used as an alternative tool to traditional in-class activity. Rumpite, Zuga, and Ritins (2006) note that online course design for ESP learning is creative and has intrigued learners to be active and positive thinkers. Unfortunately, the insufficiency of commercial products that can support collaboration in various task designs, has limited its instructional potential for ESP education. On the contrary, SL has already become a prominent and rapidly developed instructional technology for language learning and, as seen in previous section.

Second Life: The Viable Environment for ESP Learning

SL's simulation of reality in a higher fidelity has privileged its users to be immersed in a virtual environment in order to experiment and interact with the subjects and peers that they used to encounter in real life. The advantage of such simulation, as Klevjer (2001) noted, is that it consists of "complex, nonquantifiable patterns of cultural, economic, social, and psychological processes that are translated and reduced into simple rule-based generative systems" (p. 6) so that learners do not have to focus on decoding and transferring the complexity of reality prior to experimenting with it in VLE. Experiential learning is defined by Li et al. (2013) as "the process whereby knowledge is created through the transformation of experience" (p. 37). It is "learner-centered rather than teacher-centered that focuses on authentic learning and to a degree uses self-direction to provide an opportunity for feedback as well as learning from experience" (Dantes, 2015, p. 43). SL's 3-D VLE provides the spaces for such experience (Wood, 2009) and quite often such experience "would not have been otherwise available" (Meggs et al., 2010, p. 382).

Christou (2010) claimrf that the experiential nature of VW (e.g., SL) supports constructivist learning, and, therefore, as the other one of the two prerequisites that constitutes a constructivist approach in ESP learning, SL's experiential learning environment is “responsible for the learning activities that are used” (Tarnopolsky, 2012, p.79). This part of the review summarizes the rationales and advantages of using SL as an instructionally applicable venue for implementing CBI in order to teach ESP learners English for their specific purposes.

SL's Conditions for Experiential Interactive Learning

SL as the learning environment for experiential interactive language learning has several unique merits. It has the capability of implementing authentic tasks like role-playing, providing comprehensive and abundant content knowledge for experiential enhancement, engaging interactivity by interpersonal communication, and benefiting instructional design.

Authentic tasks in experiential learning environment. In order to foster experiential learning in SL, Jarmon et al. (2008) suggested that performative strategies like “role playing, improvisation, and other action-based activities” (p. 161) should be used. These strategies are implemented in the format of a project or task. Particularly, Jeffery and Collins (2008) considered role-playing one of the most useful language tasks. A task in foreign language learning is defined by Richards and Renandya (2002) as “an activity which learners carry out using their available language resources and leading to a real outcome” (p. 94). González (as cited in Butler-Pascoe, 2009) emphasized that tasks in ESP instruction should “promote real communication through activities in which the language is used to carry out meaningful real-life tasks” (p. 4). Jarmon et al. (2009) depicted a learning scenario that exemplifies SL's advantage of engaging role-playing as one of the commonly used learning tasks in ESP teaching:

Therapists, soldiers, pilots, lawyers, business people, doctors, nurses, and teachers all normally engage in real life role play while learning the contexts and conditions particular to their professions during their days at the university or in training. Multi-User Virtual Environment (MUVEs) like Second Life are uniquely suited media for developing role playing scenarios to engage learning, if we provide the right mix of opportunity and structure. Indeed, role playing in Second Life and other MUVEs may represent perhaps one of the single most compelling education opportunities for adults in 21st Century. (p. 5)

The above-mentioned statement also reflects what Thompson (2008) noted, namely, that learners perform best when they are immersed in the subjects to be learned. Schmeil and Eppler (2008) have considered role-playing an essential task design for knowledge sharing and collaborative learning in the SL learning community. Vasileiou and Paraskeva (2010) noted that “role-playing can be used for teaching literature, history, or science or for complex social problem demonstration” (p.29). Kramer (2011) conducted qualitative research to confirm the effectiveness and applicability of utilizing role-playing in SL for educational purposes. In real life, role-playing involves “immediate interpretation of, and reaction to, signals from other” (Bell, 2001, p. 68). However, for language learners it is always difficult for them to quickly transform their actual roles in their real life into the designated characters. On the contrary, role-playing in a virtual environment allows learners to have adequate time for self-reflection and consultation with instructors or peers during a scenario with the awareness of other participants. Mayrath et al. (2007) studied how students used role-playing in SL as an authentic task to achieve their learning objectives. The task helped students to be engaged more in the learning process provided students more enjoyment, engagement, a good learning experience, content relevance, and clarity of objectives. Students were able to associate what they learned in VW to real life, and it also greatly enhanced their motivation and attitude toward future learning on the subject. This unique yet authentic language task is also identified and emphasized by several other researchers (Aliakbari & Jamalvandi, 2010; De Freitas, 2008; Deutschmann & Panichi,

2009; Gao, Noh, & Koehler, 2009; Haycock & Kemp, 2008; Jarmon, 2008; Mayrath et al., 2007; Mayrath, Traphagan, Heikes, & Trivedi, 2011; Molka-Danielsen et al., 2007; Rappa, Yip, & Baey, 2009; Tseng, Tsai, & Chao, 2013). Holmes (2007) suggested that role-playing provides learners with specific characteristics and personalities necessary for learning autonomy. Mayrath et al. (2011) quoted from one of their participants about the merit of virtual role-playing in SL, that “role playing activity probably would have failed if we had done it in real life, but it worked in this world of SL because people were able to take on another character and do something new” (p. 135). Childress and Braswell (2006) also argued that “role-playing scenarios which were once only possible in a face-to-face environment may now be conducted in an online virtual world” (p. 190). Ho and Ong (2007) further confirmed from their study that role play in SL enhances learners’ critical thinking and argumentation skills. Then, Jamaludin, Chee, and Ho (2009) claimed that SL can be used for argumentative training via role-playing. Unlike face-to-face argumentation, learners in SL do not have to directly confront each other; instead, they communicate with each other via their avatars, either voice- or text-based. The avatar in SL is the social and contextual persona and representation that connect user’s real identity (e.g., gender, appearance, personality, ideology, etc.) and virtual presence (see Grosman, 2010; Koles & Nagy, 2012; Mennecke, Triplett, Hassall, Conde, & Heer, 2011; Padilla-Miller, 2014; Schultze & Leahy, 2009). By engaging virtual communication and interaction among avatars, it ensures learners’ anonymity and solicits more linguistic output that can be recorded for later analysis (Peterson, 2011). This is especially beneficial for language learners since it can minimize the interpersonal tension often seen in reality. Lee (2010) suggested that interaction and communication in SL “can be done without fear of embarrassment or loss of face, helping eliminate social or cultural biases between Western and Asian students in an educational setting”

(p. 40). This is crucially important for Asian EFL/ESL learners since it greatly reduces or alleviates the language anxiety that frequently occurs in their real life learning environments. Abal (2012) suggested that SL can lower English language learners' anxiety by immersing them in simulative and role-playing activities. Vasileiou and Paraskeva (2010) noted that "using role-playing techniques students participate actively in learning activities, as they express their feelings, ideas, and arguments, trying to convince others of their viewpoint, and, thus, they create and develop self-efficacy beliefs" (p. 29). Other ESP-oriented tasks, as Tarnopolsky (2012) proposes are "simulation of professional activities" (p. 28); "project work" (p. 28); "brainstorming" (p. 28); "case studies" (p. 28); "discussion" (p. 28); "students' presentations" (p. 28); and "students' search for professional extra-linguistic information through target language" (p. 28). SL's multimedia-enriched simulation, with collaborative and interactive capabilities enables both instructional designers to design and learners to be actively involved in authentic tasks. Reigeluth (1999) pointed out that the authentic tasks are central and integral elements of constructivist instruction.

Content knowledge for experiential enhancement. The term *micro world* is coined by Rieber (1992) as "a small but complete subset of reality in which one can go to learn about a specific domain through personal discovery and exploration" (p. 93). SL is one of the most prominent micro worlds that is rendered with 3D visualization and real life simulation, and often these virtual simulations have "low actual risks and costs" (Fang & Lee, 2009, p. 266). This feature provides learners with ample opportunity to access and experience the subject world in a virtual environment that is created based on the content knowledge and situational scenarios that are difficult to be (re)presented in traditional classrooms (see Ahern & Wink, 2010; Boulos, Hetherington, & Wheeler, 2007; Calongne & Hiles, 2008; Chittaro & Ranon, 2007; Oxford &

Oxford, 2009). Therefore, it “encourages students to turn abstract knowledge into concrete understanding” (Fang & Lee, 2009, p. 266). These include, for instance, re-creations and reenactment of historical figures and events (see Morgan, 2013), virtual tour of museums (see Cool, 2013), virtual business practice (see Nicovich, 2012), scenarios that are impossible or hard to be simulated in normal life (see Bloomfield, 2008; Galagan, 2006; Gonsalves, 2008; Foster, 2007; Lafsky, 2009; Rogers, 2009), focus groups that are vulnerable or health-care related issues that take human beings as the subjects (see Beard, Wilson, Morra, & Keelan, 2009; Cabiria, 2008; Nosek et al., 2011; Schwartz, Green, & Faser, 2010; Siddiqi et al., 2010; Wiecha, Heyden, Sternthal, & Merialdi, 2010), experiments that are too dangerous or unstable to conduct and replicate (see Dalgarno, Hedberg, & Harper, 2002; Li et al., 2013; Smart et al., 2007), and field trips that demand costly expenditure for travel and accommodation (DeMers, 2010b) and countries and regions that are politically unstable and insecure for field trip (Salmon, 2009). The unstrained and unlimited access to content knowledge in SL provides learner a relatively secured and inclusive environment for experiential learning. Table 4 lists some examples of content knowledge that were created and taught in SL.

Interactivity in SL. Lau and Lee (2012) noted that “virtual reality can possibly enhance students’ learning experiences by providing them with a heuristic and highly interactive simulated virtual environment. Being explorative and fun are essential parts of students’ learning experiences in virtual reality” (p. 1). This is critical because interaction is an essential element to engage and enhance experiential learning (Tarnopolsky, 2012). Interaction in a constructivist learning process is viewed as the primary way for individual learners to share, exchange, and apply the knowledge and experience acquired with others. What makes SL an ideal platform for interaction between instructor and learners, and among learners is that the in-

world simulation combines users' lifelike avatars with audiovisual representations of the reality in "which they would not be able to experience otherwise, in their natural presence" (Goksel-Canbek, Mavrommati, Makridou-Bousiou, & Demiray, 2011, para. 12). Petrakou (2010) studied how SL was incorporated into an online course at college level. The findings show that SL enhances interactivity since "it allows for synchronous communication and places the student in a spatial dimension" (p. 1120). The unique interaction among learners' avatars provides them a newer perspective than the traditional text-based communication that lacks personality, character, and relevance to real life. Saunders, Rutkowski, Genuchten, van Vogel, and Orrego (2011) also studied the interactivity in SL, and they conclude from data themed as directionality, perceived ease of use, and perceived enjoyment that SL offers users with solid presence in virtual space so that they can interact with each other through the creation of virtual space and objects in SL. Jauregi et al. (2011) explored SL's potential of engaging learners' social interaction and intercultural awareness by allowing learners to participate in four pre-designed authentic tasks that emphasized interaction between native speakers and learners of the target language. The findings indicate that these tasks helped increase learners' affordance in virtual learning. Tseng et al. (2013) studied how SL's avatar-based virtual environment enhanced learners of Chinese as a foreign language to be more interactive with instructors and peers in order to better understand linguistic input of the target language. Both instructor and learners perceived that the key factor for successful learning in SL was the "access to realistic scenarios and on the presence of non-verbal cues" (p. 367). Similarly, Lan et al. (2013) designed a series of interactive Chinese learning activities in SL that required participants to engage in meaningful interaction with an instructor and among peers. The results show that SL could elicit effective social interaction and oral communication, and such interaction is not "achieved by merely rote learning or recitation"

(p. 199). Robinette (2011) suggested that responsiveness and engagement affect participants' interactive experience, and the presence of avatars in SL enhances participants' interactivity among peers.

Extended to existing studies on teaching and learning EFL/ESL in SL, some studies have focused on how SL's unique interactivity engages learners in English learning. Jee (2010) studied how ESL students performed in task-based synchronous communication in SL. She designed three language tasks (jigsaw, decision-making, and discussion) to see which task lead to more effective interaction between high-intermediate and low-intermediate level students. The results indicate that low-intermediate level students tended to show more positive attitudes toward learning engagement because that these tasks were appropriate for their existing knowledge level. Peterson (2010) studied how seven college students from China and Japan perceived and facilitated the given task to engage their English learning. He found out that SL could be used as a "venue for the development of language fluency rather than accuracy" (p. 290). Similarly, Peterson (2012) also studied how nine Japanese college students utilized pre-designed tasks and activities collaboratively in order to interact with both instructor and peers in SL. It was concluded that SL provides a "stimulating environment for learners to undertake a range of beneficial forms of social interaction involving collaborative dialogue in the TL [target language]. The participants displayed considerable autonomy, and also obtained valuable practice in managing TL interaction" (p. 37). Although Peterson's (2010, 2012) studies primarily focused on learners' capability of utilizing text-based communicative interaction, it is noted that SL can also be used for verbal interaction due to its multimedia functionality (see Jauregi et al., 2011).

In sum, in order to help students engage in more experiential learning in SL, the design of task-based interaction should be seriously taken into consideration by both instructors and instructional designers. It is suggested by several researchers (Deutschmann & Panichi, 2009; Peterson, 2009; Toyoda & Harrison, 2002) that the instructor's role in VW like SL should be less dominant allowing learners to have more opportunity to be autonomously interactive. Wang (2011) has advocated that the instructor's role in constructivist language learning process should be performed as facilitator that "provides students with experiences that allow them to hypothesize, predict, manipulate objects, pose questions, research, investigate, imagine, and invent" (p. 274).

SL's Engagement for Content-Based Instruction

SL as an instructional venue also has several noticeable benefits for implementing CBI to engage ESP learning. This is primarily due to its capacity of providing comprehensive content knowledge, authentic learning materials, and quality instructors.

Richness and comprehensiveness of “content” in SL. Can (2009) pointed out that "implementing online applications, using instructional technologies and diverse media in the process of learning and teaching languages are all advocated by constructivist approach" (p. 69). He further stated that it "should be holistic with content oriented perspective, authentic and complex learning environment" (p. 68). The reason for implementing CBI in SL for ESP learning is that SL offers abundant and readily available authentic subject/content knowledge that are as good or better (in both quantity and quality) than those taught in traditional face-to-face classrooms.

SL's advantage in providing rich and comprehensive contents is prominently due to what Malaby (2006) summarizes as the four rotations of contents in SL. The contents created in SL

are categorized by programmers who constructed the infrastructure of SL, to the end users who developed and embraced of what predecessors created. Contents in SL are rotated among four layers. First, there is content as a developer's idea and framework toward the creation of SL. Second, there is content as a marketing resource that is either for commercial or non-commercial purposes (e.g., personal use vs. company branding). The third is content as the commodity that is eventually presented in SL (e.g., final entities that everyone can see). And the fourth involves content as aesthetic ideas that either inspire others' creation or involves being inspired by others (in other words, individual content creations that are in fact derivatives and associations from others' work). The entire content creation mechanism is comparatively dynamic and dependent on each one of the four contents, which quite distinguishes SL with other VWs. Spiro, Feltovich, Jacobson, and Coulson (1992) noted that constructivist strategies are best utilized for learning outcomes when acquired knowledge is relatively advanced as in, for instance, aviation-related knowledge that is profession-specified. Other examples of content knowledge and subjects that have been created and taught in SL can be retrieved from a previous section (see Table 4).

Authentic learning environment, resources, and quality instructors in SL. Authentic tasks as previously discussed are available in an authentic learning environment, and such environments can be either physical or digital (e.g., virtual) (Lombardi, 2007). The physical authentic environment for language learning is the country or region where target language is predominantly used for communication among its members, and all their social activities rely primarily or exclusively on this language. It is economically unrealistic for non-native English speakers to come to the English speaking countries just for the purpose of immersing themselves in such authentic learning environment. However, VWs like SL can be used as virtual authentic learning environments, as Lombardi (2007) noted

Authentic learning typically focuses on real-world, complex problems and their solutions, using role-playing exercises, problem-based activities, case studies, and participating in virtual communities of practice. The learning environments are inherently multidisciplinary. They are not constructed in order to teach geometry or to teach philosophy. A learning environment is similar to some ‘real world’ application or discipline: managing a city, building a house, flying an airplane, setting a budget, solving a crime, for example. (p. 2)

According to Blasing (2010), SL “offers educators access to native speaker communities, cultural exchange, and the possibility of creating content-rich learning activities —such as scavenger hunts, role-plays and virtual cities or museums — for all levels of learners, from beginner to advanced” (p. 115). Goksel-Canbek et al. (2011) suggested that in SL one would expect to find more opportunities for real interaction with native speakers of the language learnt or even virtual trips to their countries.

Contents presented in SL are those simulated objects and activities of similar high fidelity and quality as those seen in reality. According to Koh, Tan, Tan, Fang, Fong, Kan, Lye, and Wee (2010), authentic materials presented in 3D-based simulation increase learners’ motivation to persevere in their learning. An authentic learning environment is an essential element for ESP instruction as it aims to motivate learners to engage in real-life activities by initially enabling them to collaborate on certain ambiguous problems and projects that can be solved by multiple solutions. Such learning experiences are not gained from what the instructor guides learners to do but from what learners explore. Hence, those who have been accustomed to traditional teacher-centered instruction need to transform roles in learning, in order to avoid suspension of disbelief (Herrington, Oliver, & Reeves, 2006). It is noted that such a psychological factor is more obvious in physical authentic learning. This is because learners directly confront both instructor and peers in an unfamiliar and uncomfortable situation that increases the chance of resistance and unwillingness (Herrington et al., 2006). On the contrary, SL provides a relatively

relaxed physical and psychological distance that protects and harbors novice learners in digital entities that are in the format of avatar. Therefore, the immediacy of conflict and confrontation that can occur in reality can be effectively alleviated or reduced. This ensures the formation and development of learner-centered constructivist learning process.

It is widely noted that in Asian EFL/ESL contexts, there is a scarcity of well-trained and knowledgeable instructors in both target language and content knowledge (Warrington, 2008). However, via the VLE of SL, it is relatively economical and convenient to recruit a qualified content knowledge instructor who is also a native English speaker with EFL/ESL teaching experience and from one English speaking country or region. Liou (2012) studied how students from one college in Taiwan used SL as an authentic learning environment for communication study in English. Four tasks were used to systematically enable learners to familiarize themselves with and utilize the resources in SL for English learning, including SL orientation, chatting, pedagogical activities and peer review. With a qualified instructor participating in every process of SL's in-world tasks, it was acknowledged by researchers that, even when students encountered technical issues like low quality internet connections, their attitudes were positive due to the initiation of in-world orientation, clarification of learning objectives, and effective task design and implementation. These factors satisfy the affordance of interaction and immersion with peers and instructor, and among learners in SL.

Henderson et al. (2012) used SL to teach non-Chinese natives Mandarin Chinese. In their designed course, students were taken into a virtual simulation of a Chinese restaurant in SL where students learned to order Chinese food in their Chinese names, and they utilized simulative visual aids to help learners better understand the names of the foods while learning the food culture behind the language as well as famous recipes and food ingredients. By

immersing in such VLE, students not only mastered the Chinese language, but also were able to utilize it into a real life experience. They were capable of ordering authentic Chinese food in correct Chinese while sitting in a Chinese restaurant. However, they did not need to come to China for that purpose as all instruction was done virtually by an experienced bilingual (Chinese and English) instructor. This study is a typical example of using SL for CBI, although the target language was not English, it still shows the positive evidence that SL is a viable instructional venue for CBI to teach language for specific purposes.

In sum, SL as an instructional venue has demonstrated its advantages in providing quality and comprehensive content knowledge in incorporating CBI, as well as immersing learners in an interactive and experiential environment that reflects the real world. Both conditions are realized in SL to ensure ESP teaching and learning to be successful. Tarnopolsky (2012) indicated that ESP classes taught at tertiary schools should not separate experiential learning from CBI, because if English was not taught based on a specifically predefined content, “the very sense and essence of teaching English for specific/professional purposes will be irretrievably lost” (p. 74). This pedagogical advantage of SL has guided the research focus of the study.

SL’s benefits for instructors and instructional designers. As highlighted in previous chapter, subjects/disciplines and activities created in SL are permanently available unless the owners/creators delete them or when SL undergoes necessary maintenance routines. The continuum and persistence of in-world simulations have ensured the instructional sustainability. Once created, both instructors and learners can access unlimited times, without abandoning, replacing, or repurchasing for extra resources. Linden Lab (2009a) provides a *Second Life Education Directory* that includes some major and functioning virtual institutions, instructional projects and programs that interested instructors can usually access without requesting

admission. Conners (2009) studied 67 educational sites that could be of great reference for instruction, most of those active institutions, projects, and programs are regularly updated and maintained by owners. Linden Lab (2013b) also manages a wiki portal that specializes in offering educational information, resources, and technical support. In addition to instructional support, there are several programs and projects created specifically for EFL/ESL education. Hismanoglu (2012) listed four highly developed English education resources in SL (pp. 106-107) and other programs like “ESL in Second Life, Second Life English, EFL/ESL in Second Life Team, English Village and I am learning English” (Balcikanli, 2012, p. 135) can also be directly used by language instructors.

Unlike all other VWs, SL has a well-established dynamic mechanism that liberates both users and instructional designers, no matter what prior VW experience and background they have. Those who have little or no knowledge in using SL for educational purposes are not isolated from experienced users both in-world and outside of SL. Linden Lab provides an online support service, a user-oriented community (Linden Lab, 2015c), and listservs like SL Educators (Linden Lab, n.d.) and SLR (Second Life Research) (Dawley, 2009) that can help troubleshoot technical or personal issues for learners, course instructors, and instructional designers, and experts from various disciplines also provide valuable guidance and information on exploring SL’s educational potentials (see Tu & Smith, 2010). Moreover, since SLV is technically an open source software (Linden Lab, 2015d), programmers and instructional designers are encouraged to explore and develop more of its potential by modifying SL as avatar-controlled scenario-based games (see Atkinson, 2013; Kastoudi, 2012; Pereira, 2009; Pereira, Cánepa, David, Filippo, Raposo, & Fuks, 2009; Vega, Fuks, & Carvalho, 2009; Vega, Pereira, Carvalho, Raposo, & Fuks, 2009) and integrating it with virtual library resources (see Boulos et al, 2007;

Jennings & Collins, 2007), other educational applications (e.g., blog, learning management system, MS Office Suites, online discussion board, podcast, YouTube, and wiki, etc.) and devices (e.g., conferencing system, Whiteboard, projector, etc.) (see Bowers, Ragas, & Neely, 2009; Burgess et al., 2010; Carter, 2008; Carter& Elseth, 2009; Corder & U, 2010; da Silva, 2012; De Freitas, 2008; De Lucia et al., 2009a; De Lucia et al. 2009b; Deutschmann & Panichi, 2009; Ellis & Anderson, 2011; Girvan, Tangney, & Savage, 2013; Goode, 2011; Hismanoglu, 2012; Kemp & Livingstone, 2006; Kemp, Livingstone, & Bloomfield, 2009; Knutzen & Kennedy, 2012; Lawless-Reljic, 2010; Lemon & Kelly, 2009; Livingstone, Kemp, & Edgar, 2008; Minocha & Roberts, 2008; Molka-Danielsen et al., 2007; Peachey et al., 2009; Redd & Silva, 2010; Saunders et al., 2011; Schwartz et al., 2010; Silva, 2012; Sutcliffe & Alrayes, 2012; Thomas, 2010; Vickers, 2007; Wu, 2012) in order to engage and extend learners' experience gained from in-world to real life applicability. Moreover, the incorporations of SL with other educational applications also helps instructors better assess learners' performances (Crisp, Hillier, & Joarder, 2011). In sum, SL's incomparable extendibility, embeddability, and compatibility with third-party applications provide some of the most noticeable advantages that distinguish SL with all other VWs and educational technologies.

Kingston (2011) concluded from the study findings that instructional designers are able to transit “their experience and past practices to guide their efforts in the design of instruction” (p. 65), from the traditional classroom to VLE in SL and the traditional design process which includes analysis, design, development, implementation, and evaluation (ADDIE) can also be applied in SL (Kingston, 2011; Wang & Hsu, 2009).

Summary

Globalization has impacted people's lives in multiple ways including how we are educated. In EFL/ESL education, globalization is centrally reflected by the inevitable shift from traditional in-class, linguistic-oriented instruction to online/distance and virtual learning that highlights and features the pragmatic implication of the target language. This chapter reviews the advantages and deficiencies of using SL as an instructional medium and explores its educational implications. The review reiterates the benefits of SL for EFL/ESL education, identifies some drawbacks that include various learner factors, and most importantly the missing underpinning: the lack of research focus and practice on ESP that calls for further discussion and development. The literature review explores SL's two major conditions that realize and engage ESP teaching and learning: the opportunity for constructing experiential and interactive learning environment and advantages and benefits for implementing CBI. The literature review has laid the empirical and theoretical foundations to the proposal of research questions of the study.

CHAPTER III:

METHODOLOGY

Introduction

The unprecedented and inevitable trend in globalization has called upon English language educators, practitioners, administrators, and learners to be better equipped with the knowledge and skills for utilizing English in a more pragmatic way. This study explored the viability of utilizing Second Life (SL) as the virtual learning environment (VLE) to teach and learn English for specific purposes. The research adopts a qualitative approach because it is grounded in an essentially constructivist philosophical position, which might enable both researcher and readers to understand “the meaning people have constructed about their world and their experiences” (Merriam & Associates, 2002, p. 4). The intent of qualitative research is to examine a social situation or interaction by allowing the researcher to enter the world of others and attempt to achieve a holistic rather than a reductionist understanding (Maxwell, 2005; Merriam, 1998; Patton, 2014). Qualitative research puts great emphasis on discovery and description, and the objectives are usually focused on extracting and interpreting the meaning of experience (Denzin & Lincoln, 2011; Merriam, 1998). Under such a methodological lens, “words and pictures rather than numbers are used to convey what the researcher has learned about a phenomenon” (Merriam & Associates, 2002, p. 5).

Setting

Background and Rationale of Studying Aviation-Related English as an ESP Subject

This study was situated in the field of aviation inter-communication, where English was used for specific purpose to communicate between pilot and air traffic controller (ATC). Aviation English among non-native English-speaking personnel is seen as critical and sometimes greatly impacts one's career growth. This is more obvious when International Civil Aviation Organization (ICAO) (2005) requires all non-native English-speaking aviation-related personnel to achieve and maintain English proficiency at a satisfactory level. Zhou, Ou, Cao, and Li (2007) noted that ICAO English proficiency requirements are the major challenge for Chinese airliner pilots and crew members, as well as ATCs, and this is especially prominent among those who serve international airlines and work at international airports. English learners who major in aviation-related programs are prepared to become future pilots, flight attendants, and ground management and air traffic control personnel. However, their actual needs of mastering English for their professional purposes have rarely been realistically satisfied. Those who have passed various English language tests often find themselves still unable to utilize English in their respective workplaces. Therefore, ICAO's (2010) *Guidance Manual* has recommended that English training should be content-oriented. Mathews (2007) explained that the content of aviation English determines language training not be taught like it was previously. The simple linguistic acquisition of aeronautical radiotelephony and phraseology (English as restricted language) cannot satisfy the needs of experienced pilots and controllers, as well as those of novice trainees. It is essentially important for every pilot and co-pilot to comprehend and master the aeronautical jargon in English in order to accurately communicate with ATCs who are involved in international traffic. Therefore, Mathews (2007) has emphasized that the teaching of

aviation English to non-English native speakers should consider the necessity of teaching the language and content simultaneously in order to make learning more profession-oriented and practical. This is particularly critical for those non-native, English-speaking pilots and controllers who have direct involvement in the civil aviation industry. Mathews (2007) has suggested that one possible way of delivering those content courses is through web-based learning because aviation-related personnel are busy professionals, and it is costly and unrealistic for them to sit down in a traditional classroom environment and comply with scheduled attendance. Aviation inter-communication was chosen as the content subject for this study based on these considerations.

Research Site

Richardson and Newby (2005) have emphasized that distance education (e.g., SL) “should be less concerned with comparisons between traditional, face-to-face classroom environments versus distance learning environments and focus instead on ‘how learners learn in online learning environments’ and ‘how students engage with their online courses’” (p. 2). For this reason, the entire study was conducted within a pre-designed VLE in SL. Specifically, the environment was a semi-private virtual classroom with access and extension to relevant aviation artifacts and facilities (for field experience and practice) adopted and modified by the researcher. The virtual classroom and aviation artifacts and facilities were only accessible via teleport invitation sent by the researcher.

Course Design Description

The SL in-world course for the study was titled *English for Aviation Communication: An Interactive Course in the Second Life® World* and contained two modules. Module 1 was the SL orientation that helped new users better familiarize themselves with the VLE of SL and all other

information and experience necessary to successfully participate in the course. Module 2 consisted of the three types of aviation-related English for specific purposes (ESP) as discussed in previous chapter, intercommunication between pilots and ATCs, which was English as restricted language. There were three sessions in Module 2 with the average duration of 50 minutes for each session.

Module 1: SL orientation. This module consisted of two sessions of instruction with each session lasting for about 55 minutes. It was designed in light of the first two steps: “setting the stage” (para. 15) and “acclimating” (para. 15) in Wang et al. (2012) and their three-step mode of SL course design that provides learners extra technical support and assign simpler tasks to help them become more familiar with the SL dynamic. According to Peterson (2006), a pre-study orientation could help novice users better understand and utilize SL. Murray (2015) suggested that an orientation session engages learners’ use and perception of SL for their subsequent study in VLE of SL. Therefore, Wang et al. (2012) suggested that instructor should “prepare students for task completion” (p. 958).

In Session 1 of Module 1, a video tutorial provides a brief introduction on how to create and manage an SL user account, configure an avatar, and other basic functionality one can operate. Learner participants were initially led to *Orientation Island Public* (Linden Lab, 2015e), the in-world orientation premise for all new users. They were able to find a brief introduction and FAQs in that location. Andrews (2007) warned that SL users might find the Orientation Island less useful when they are simultaneously engaged in such a virtual environment. To minimize this negative factor, learner participants were allowed to raise any questions and concerns about their experiences and involvements in SL whenever needed via

either in-world or through external communication such as instant messaging (IM) software QQ International (Tencent, 2015).

In Session 2 of Module 1, learner participants were directed to two of the best user-run communities for newcomers: *New Citizens* and *Shelter* (Wagner, 2008) and one community volunteer page where “instructors, mentors, live help staff, and greeters” (Hayes, 2006, p. 156) were ready to answer questions and help new users. A series of SL video tutorials adapted from YouTube were also provided as extra support. All video/PPT presentations were displayed on the virtual jumbotron in the virtual classroom of SL.

At the end of the orientation, a pop quiz on the use of avatar and other basic functionalities and features of SL was given in order to ensure learner participants fully understood and familiarized themselves with the VLE of SL. After the completion of Module 1, it was expected that learners would be able to begin their learning journey in SL, namely, “testing the waters” (Wang et al., 2012, para. 15). Table 6 lists a summary of the SL orientation that reflects above-mentioned considerations.

Table 6

Module 1 Summary

<i>After completing this orientation, learners are able to</i>	
<p>1. Recall and identify the basic terminologies and commands used in SL. 2. Distinguish and employ instructor's commands. 3. Describe SL's mechanism of in-world communication and interaction. 4. Recognize SL's in-world regulation, policy, and VW culture. 5. Locate needed information from the resources provided. 6. Establish the connection between learning objectives and SL use.</p>	
<i>Activities</i>	
Session 1	Session 2
A. Brief introduction of this orientation. (5 min) B. Video presentation of intro to SL's history, development, and educational potentials. (10 min) C. Visual demonstration on avatar's basic functionalities. (15 min) D. Learners are given pressure-free, researcher-guided practice on avatar operation (e.g., moving, customizing, and chatting, etc.) and other essential in-world functionalities. E. (20 min) F. Learners are given specific commands on operating their avatars for some simple tasks. (10 min)	A. Guided tour of virtual classroom, simulative facilities (cockpit and ATC tower) in SL and related premises (e.g., SL Orientation Island, New Citizens, and Shelter, etc.). B. (20 min) C. Learners are given pop quiz on SL basics & functionalities. (10 min) D. Instructor/researcher-led SL Q&A mini seminar. (20 min) E. Learners are given bilingual (English and Mandarin Chinese) version of SL user manual (with detailed introduction and links to available resources) in PDF format. They are allowed to raise any questions and concerns about the use of SL, via in-world communication, IM, or email to the researcher after the orientation. (on-going process) F. Orientation summary and closure. Preview of Module 2. (5 min)

Note. Quiz was embedded in SL.

Module 2: Intercommunication between pilots and air traffic controllers (ATCs).

This module consisted of three sessions. The rationale for designing such content was based on the consideration that interpersonal communication is seen as essential in every industry and workplace, but unlike business communication and other professional settings in our society, communication in civil aviation is more restricted because such English usage (primarily aviation terminology and phraseology) is pre-defined based on their particular situations, and is therefore only communicable within such a context. However, due to the insufficiency of authentic literatures and information written in non-native English personnel's native languages, and the blockage of internet access to relevant authentic resources (e.g., Google and Wikipedia) in countries such as China (Frizell, 2014), many Chinese professionals have ignored or underestimated the importance of intercommunication between pilots and ATCs in the civil aviation industry. The design of Module 2 utilized SL's in-world simulations of several regional airports with air traffic control facilities (both interior and exterior) and cockpits of two mainstream passenger aircrafts to give learners a direct and immersive experience in those work places that are always inaccessible and unrealistic in traditional classroom.

The primary instruction for Module 2 was in the format of multi-media presentations with instructor's narrations. This was in accordance with what the instructor used to teach in face-to-face classrooms as well as in online instruction. By doing so, the instructor was able to more naturally transition into VLE in SL. Video presentations were used due to their comprehensiveness and authenticity in presenting content knowledge in English in a multi-media manner. All videos were adapted from YouTube with free permission of distribution for educational purposes and were converted and embedded then presented in the virtual classroom in SL. Videos were carefully selected according to the specific topics and learning objectives

and in consultation with the instructor. The reason for using YouTube videos is because, as the biggest video sharing website in the world, YouTube has been blocked in many countries including Mainland China (Chang, 2009), and, therefore, Chinese learners have no direct access to these videos. SL at this point offered them an opportunity viewing those videos indirectly.

Session 1 started with the instructor's brief introduction of the Module 2 and continued with video and PPT presentations. The primary learning objectives for this session were to help learners recall and become aware of the importance of aviation communication in the civil aviation industry and to help identify and seek possible solutions of several inter-communication failures. Learners were also able to explain the cause and effect of a phenomenon (e.g., aviation communication failures) and draft a "compare and contrast" style of English essay on these topics. During interval off-line time (instructor and learners were not synchronously presented in the VLE of SL) between each in-world session, learners were allowed and encouraged to review recorded videos of previous class sessions and raise any questions and concerns via in-world asynchronous communication. The instructor responded to these questions and concerns prior to the next in-world session.

Session 2 began with the same instructor-led activities that included a review of the previous session, video and PPT presentations on the learning objectives of intercommunication hardware, systems, and facilities, and their standard English names, abbreviations, and acronyms. Learners were given game-like tasks to help engage their understanding and comprehension of these objectives. After the completion of Session 2, students were able to identify and articulate the above-mentioned learning objectives.

Session 3 aimed to extend learners' conceptual knowledge of aviation communication to the real-life scenario. It started with a brief introduction and then video presentations of real-

time intercommunications between pilots and ATCs were presented. The instructor later demonstrated how to perform as both pilot and ATC in an authentic and professional manner, and asked the class to do role-playing with him in turn. Learners were then paired up to role play for both positions (pilot vs. ATC). The role-playing was recorded and one recording was selected for an analysis task that assessed the learners' comprehension on the learning objectives. The instructor provided assessment on learners' performances and advices and suggestions on future improvement.

Wang et al. (2012) suggested that instructors should "encourage post-task reflection" (p. 958) and "provide feedback" (p. 958). After the completion of Module 2, learner participants completed self-reflections, and the instructor provided assessment on learners' performances and brief course evaluation. They were filed in the researcher's observation as "portfolio assessment" (Benson, 2003, p. 75).

The tasks designed and completed in Module 2 focused primarily on the interactions between instructor and learners and among peer learners, which were in light of what Tarnopolsky (2012) suggested for ESP learning (see Table 7).

Table 7

Tasks in Module 2

Tasks in Module 2 (S=Session)	Authentic ESP-oriented tasks (Tarnopolsky, 2012, p.28)
S3. Role-playing: Pilot Role-playing: ATC Role-playing: Pilot vs. ATC	Simulation of professional activities
S3. “What’s going on? Who’s doing wrong?”	Project work
S1. Group discussion “Which is which” 1 “Which is which” 2 S3. “What’s going on? Who’s doing wrong?”	Brainstorming
S1. Case study	Case studies
S1. Group discussion S3. “What’s going on? Who’s doing wrong?”	Discussion
S1. Group discussion S3. “What’s going on? Who’s doing wrong?”	Students’ presentations
S1. Document retrieving and analytical writing S2. Flashcard 1 Flashcard 2	Students’ search for professional extra-linguistic information through target language

Table 8 lists a summary of learning objectives and activities achieved and completed in Module 2. The content-based aviation English lesson plan implemented for Module 2 is detailed in Appendix C.

Table 8

Module 2 Summary

After completing Module 2, learners are able to:

1. Recall the history and development of civil aviation communication.
2. Raise awareness of the significance of communication in civil aviation industry.
3. Analyze and explain common causes and possible solutions of aviation communication failures.
4. Identify the appearances and describe the functionalities of intercommunication equipment used in cockpit and ATC tower.
5. Identify the appearances and describe the standard English names, abbreviations, and acronyms of the intercommunication equipment used in cockpit and ATC tower.
6. Identify the appearances and describe the standard English names, abbreviations, and acronyms of commonly used communication system and software used in two-way (pilot and ATC) intercommunication.
7. Identify and differentiate the terminological meanings of general phraseology used in typical two-way (pilot and ATC) communications in real time.
8. Distinguish and interpret ATC's incoming communication and pilot's incoming communication.
9. Demonstrate competitive verbal communication with pilot (and ATC) using correct and appropriate English phraseology.
10. Cultivate the perception of the difference between English as general language and English as restricted language.
11. Establish and recall the usage and situation of general phraseology used in typical two-way (pilot and ATC) communications in real time operation.
12. Compare and practice the typical procedures of initiating contact with ATC, and the typical procedures of receiving initial contact from pilots.
13. Complete the procedures of subsequent contacts and responses with ATC, and the procedures of subsequent contacts and responses with pilots.

Activities

Session 1

1. Introduction (5 min)
2. Video presentation (5 min)
3. PPT presentation (5 min)
4. Session review and summary (5 min)
5. Assessment on learners' performances (on-going)
6. Case study (15 min)
7. Group discussion (15 min)
8. Document retrieving and analytical writing (on-going)
9. Individual learner's self-reflection (on-going)

Session 2

1. Review of last session (5 min)
2. Group discussion (5 min)Video presentation (5 min)
3. Session review and summary (5 min)
4. Assessment on learners' performances (on-going)
5. PPT presentations and team tasks (30 min for 2 sections)
6. Flashcards (on-going)
7. Individual learner's self-reflection (on-going)

Session 3

1. Review of last session (5 min)
2. Video presentation (10 min)
3. Session review and summary (5 min)
4. Assessment on learners' performances (end of the session)
5. Role-playing (30 min for 3 sections)
6. Group discussion (5 min + on-going process)
7. Individual learner's self-reflection (on-going)

Instructional Design Guidance

Shih and Yang (2008) emphasized that a qualified instructor in an authentic learning environment should “first, create motivating goals for students to get information; second, situate students within an authentic learning context; third, give students tasks that must be completed by analyzing the information they get and devising a course of action” (p. 58). In light of this recommendation, and based on the instructor’s prior teaching experience in both face-to-face and online modes, the researcher took several factors proposed by Mayrath et al. (2010, pp. 422-423) into consideration when designing the authentic SL course. They are categorized as pedagogical, contextual, and logistical factors (see Table 9).

Table 9

Factors Considered for Designing SL Course

Pedagogical Factors	Contextual Factors	Logistical Factors
relevance	activity durations	usability
complexity of SL skills	frequency of events	training
use of SL affordances	prior student experience	technical support computer issues

The pedagogical factors are relevance, complexity of SL skills and use of SL affordances. Relevance means the “relevance between an activity and an instructional objective” (p. 422) and that “when students explicitly understood SL’s relevance, they valued the integration of SL in the course” (p. 422). Module 1 helped learners better understand the relevance and significance of learning English for specific purposes in SL. The complexity of SL skills refers to the “complexity of SL skills needed to complete the activity” (p. 422) because “SL tasks that require high skills also require more time” (p. 422). To minimize such complexity, Module 1 helped learners better acquire and become familiar with SL’s interface and basic functionality, so they

would be able to spend more time accomplishing the tasks in Module 2. And each task in Module 2 was given ample time for learners to understand the requirements and objectives prior to working on it. SL’s instructional affordances include “the 3-D immersive environment, global collaboration, role-play simulations, modeling and creation, and multimedia publishing” (p. 422). To enhance SL’s instructional affordances, the tasks and activities in Module 2 were designed in the format of collaboration between learners and instructor, and among learners, role-play simulations, and multimedia modeling (e.g., instructor’s lectures and presentations).

The contextual factors are activity duration, frequency of events and prior student experience. Activity durations refers to “the length of a SL activity” (p. 422). This is an important factor because “class time [has always] constrained students’ SL use” (p. 427). Based on this factor, individual activities and tasks were limited to within 20 minutes based on the consideration of several factors such as a learner’s familiarity with SL, learning interest, retention, and anxiety. The frequency of events “refers to the number of times activities were conducted throughout the course” (p. 422). For this course, the same or similar activities and tasks were conducted and completed multiple times throughout Module 2 in order to help learners better establish the level of participation and engagement. Prior student (game) experience refers to the fact that those “who are ‘gamers’ are more generally comfortable in 3-D immersive environments compared to ‘non-gamers’” (p. 423). To overcome this gap, Module 1 helped learners with various SL experiences minimize individual differences in recognizing and accepting SL as a positive learning tool.

The logistical factors are usability, training, technical support and computer issues. Usability refers to the issue that “students found SL to have a learning curve” (p. 427). The usability was reflected from learners’ performances and feedback during Module 1. This gave

the researcher ample time and information to modify and improve the instructional design for the upcoming Module 2, which was the primary portion of the study. Moreover, “the amount of training provided depended upon the resources available, the students’ skill levels, and the skills required for the SL activity” (p. 423), and it is also “dependent upon the duration and frequency of the SL activity, training may be needed to scaffold students” (p. 427). For this reason, Module 1 served as the primary function of training new users. Technical support includes “instructional design consulting and setting up and managing SL spaces or groups for class activities” (p. 423). For this SL course, the researcher was responsible for troubleshooting any technical issues. He would “closely monitor student language performance” (Wang et al., 2012, p. 958) and negotiate with the instructor on any incongruence. Last but not least, it is “important to describe the computer requirements explicitly to students before the activity began so they could plan accordingly” (p. 423) because “student’s ability to access SL needs to be considered so all students can participate” (p. 427). To ensure this, learner participants were recruited based on their having satisfied the minimum or preferable computer requirements recommended by Linden Lab (see Appendix B).

Participants

Knobel (2003) suggested that research into online communities is time-consuming and that sometimes researchers might feel distracted and eager to complete the study in a rushed manner. Such negative psychological factors can also be true of participants. Moreover, the complexities for learning in virtual worlds (VWs) as identified by Erlandson, Nelson, and Denham (2010) also affect the success of conducting a study in such a non-traditional setting. Taking these factors into consideration, the selection of participants was based on purposive

sampling (Schutt, 2006; Silverman, 2013) that can increase participants' confidence, involvement, and engagement toward the study (Patton, 2014).

Learner Participants

Bertaux (1981, p. 31) suggested that in most qualitative research the minimum acceptable sample size is 15. For this study, a group of 16 learner participants from one higher education institution in China that offers aviation-related programs was recruited. Recruitment was done via the assistance of one professor with whom the researcher is acquainted and who was willing to help recruit learner participants. This professor's affiliated institution offers multiple aviation-related programs. Thus, purposive sampling, which is one of the typical nonprobability sampling methods for case study research, was then used.

The criteria used to select the 16 learner participants were (1) they majored in aviation-related programs (e.g., avionic engineering, civil aviation management, pilot and flight attendant training) and were willing to participate in the study; (2) they took the College of English Test Band 4 (CET-4) test, the initial national college-level (for undergraduates only) English proficiency test issued and administered by China's National College English Test Committee (n.d.), obtaining a minimum score of 550, which is the average "passing" rate of the full score 710; (3) they were computer literate and had access to computing devices (either public or personal) that met the minimum requirement or recommended configuration (see Appendix B) of successfully running the SL viewer and connecting to the internet; (4) their age was 19 or above; and (5) they had extracurricular time of at least one hour per week for four consecutive weeks. In order to engage effective and valid recruitment, the researcher offered free consultation services to each participant wanting to apply for graduate schools in the U.S and/or seeking jobs in aviation-related professions, based on their respective preferences.

Content Knowledge and English Language Instructor

Ideally, in an English content-based instruction classroom a content knowledge instructor (CKI) cooperates with an English language instructor (ELI) who provides assistance in regards to certain linguistic issues. For this study, the functionality of CKI and ELI was fulfilled by one instructor. In order to identify and locate such CKI/ELI resource, candidates were contacted in an area local to the researcher's US institution. One final candidate was chosen and invited because this person (1) was willing to participate in the study; (2) held valid Certified Flight Instructor (CFI) credential certified by Federal Aviation Administration (FAA, 2004); (3) was a native English speaker and ideally without a noticeable Mississippi-Gulf dialectical accent; (4) had taught aviation courses in English (as also required by FAA) for non-native English speaking students (e.g., those from Asia, South America, and Europe) in at least one fixed-base operator (FBO) that provides instructional services like civil aviation training (e.g., prep course for FAA written exam and in-flight instruction for solo test and check ride), either in-class or online before; (5) was computer literate and able to operate Second Life Viewer (SLV) with internet connection; and (6) was able to devote at least one hour per week for four consecutive weeks for the study. As an incentive, the researcher advertised the instructor participant's service as CFI to those might be interested.

Limitations

There were several limitations that were centrally related to the participants of the study. First, since learner participants shared the same ethnic background with the researcher (Chinese from Mainland China), the researcher did not scrutinize each participants' cultural, social, and ideological background as well as if these factors affected participants' performances, learning outcomes, and perceptions in SL. Second, according to Bain and Rice (2006), gender difference

has little effect on one's perception and attitude of using technology-related applications (e.g., computer) for learning, therefore, the study also did not take gender as a possible factor into consideration. Third, although all recruited learner participants provided documented proof (e.g., standardized English tests) of a certain level of English proficiency, it was still difficult for the researcher to verify their actual linguistic background and ensure they had adequate knowledge to comprehend the lectures and instruction. Last, according to Maxwell (2005), *participant reactivity* is a phenomenon in which interviewees might have difficulty adapting to the researcher's role as interviewer. To avoid or minimize this negative factor, at the beginning of this study, the researcher clearly explained the objectives of this study to the learner participants, emphasized the importance of being honest and truthful to their answers and performances, and informed them in advance of the procedures that would be used in order to best protect their confidentiality.

Instrumentation and Data Collection

Tolson, Fleming, and Schartau (2002) suggested that the descriptive case study method "allows data to be collected from as many sources as are considered appropriate to provide in-depth information" (p. 515). Therefore, to better understand the participants' perspectives and gain more in-depth understanding toward the phenomenon being studied, the researcher employed multiple qualitative instruments such as survey, interview, observation, and document review. This strategy strengthened the rigor, breadth, and depth to the study and offered corroborative evidence of the data obtained (Creswell, 2012; Denzin & Lincoln, 2011; Golafshani, 2003). To help illustrate this strategy, Table 10 presents the data management plan, which describes the data sources, data collection methods, and data analysis methods used for each research question.

Table 10

Data Management Plan

Research Questions	Data Sources	Data Collection Methods	Data Analysis Methods
What are learner participants' attitudes and motivations in learning ESP in SL?	Learner Participants	Survey (pre-course) Observation (during course) Interview (post-course)	Qualitative Content Analysis
In comparison to in-class learning, what are learner participants' experiences of learning ESP in SL?	Learner Participants & Instructor Participant	Observation (during course) Interview (post-course) Document review (post-course)	Qualitative Content Analysis
What do learner participants consider to be the affordances of SL for ESP learning?	Learner Participants & Instructor Participant	Observation (during course) Interview (post-course) Document review (post-course)	Qualitative Content Analysis

Survey

According to Fowler (2013), the advantage of using surveys in qualitative research is that they are relatively easy to be administered and managed. This study used an online pre-study survey (see Appendix D) to collect learner participants' background information such as academic program, level of English proficiency, current and future academic goals, future professional/career plans, and pre-study survey questions. The survey was designed using

Qualtrics and was administered within the VLE of SL, via an embedded link in order to not interrupt the normal instruction within the SL. The pre-study survey was given at the end of Module 1.

Cocciole et al. (2007) conducted the study on the possibility and benefit of using SL as a research tool for survey; the findings showed that participants were more familiar and willing to use in-world survey, and by doing so they could easily refer to the virtual environment. This method was quite applicable to this study as the researcher aimed to understand how participants learned in such a VLE and the use of in-world survey provided a valuable reference. The survey was written in English. In case of the instability of SL in-world communication, the link was also emailed and shared in a QQ private group (only group members had access to it).

In-world Observations

In order to understand participants' experiences in SL in real time, in-world participant observation was utilized. Participant observation was defined by Schensul, Schensul, and LeCompte (1999) as "a process of learning through exposure to or involvement in the day-to-day or routine activities of participant in the research setting" (p. 91). For this study, observation was primarily focused on the teaching and learning activities between instructor and learner participants in Module 2. A total of 160 minutes of the course were observed by the researcher. In-world observations were recorded with audio and video with participants' unanimous consent. In-world communications (e.g., voice, text, and motion) were recorded by the screen capture software Camtasia Studio (TechSmith, 2015). Voice communications were transcribed verbatim and text communications were directly copied from SLV's dialogue window and transcribed. The motions of avatars were captured and recorded by Camtasia Studio from researcher's avatar's point of view. The observation plan (see Appendix F) details the step-by-step procedure

of how the researcher conducted observations and collected data in SL. Based on this plan, an observation logbook (see Appendix G) was used to record the detailed information the researcher perceived as relevant to the research questions as well as study settings suggested by Schensul, Schensul, and Lecompte (1999), which included the number of attendees and the descriptions of the activities being observed. The observation logbook was also used to obtain advice and suggestions from both instructor and learners participants.

Interviews

Post-study interviews lasting 15-20 minutes were conducted with each learner participant (and the instructor) at the end of the SL course. Interviews “attempt to understand the world from the subject’s point of view, to unfold the meaning of people’s experiences, to uncover their lived world” (Kvale, 1996, p. 1). Interviews in qualitative research are usually semi-structured so that researchers are able to focus on the subject while the flexibility of the interview is also ensured (Bamberger, Rugh, & Mabry, 2006). A post-study interview was used for this study and the interview questions were designed as open-ended and delivered in a conversational manner (Kaplan & Saccuzzo, 2012). Interview questions are listed in Appendix E. Schensul, Schensul, and LeCompte (1999) advised that, in order to be a qualified interviewer one should

Keep in mind how the topic relates to and illuminates the larger question asked in the study;

Determine whether the person being interviewed is staying on topic, and if not, how to reintroduce the topic;

Understand what logical connections the interviewee is making in the discussion when those connections are likely to be quite different from those of the interviewer;

Probe for meaning of terms;

Recognize when the interviewee’s ideas are clearly expressed, and when they need to be elaborated to make sure that they can be understood by everyone who reads the notes or transcripts. (p. 122)

Based on these considerations, interviews for individual learner participants were conducted within SL using internal audio chat (unless required by participants to use text communication). By doing so, learner participants were less affected by external interruption and the consistency and smoothness of the in-world activity were then ensured (Dean et al., 2009; Hasler et al., 2013). In-world interviews were also seen as an integral part of studying SL's educational potential. Moreover, the use of SL's rapidly developed internal communicative mechanism made the interview process more manageable and secure (e.g., avatars represent real interviewees).

Bamberger et al. (2006) suggested that researchers pay attention to cultural diversity and linguistic differences between interviewer and interviewees. Although the primary language used for the study and interview questions was English, learner participants were still allowed to choose between Chinese and English as the communicative language for individual interviews. Interviews for individual learner participant were conducted during their respective available time slots, and were contacted via IM software QQ and email in advance for confirmation. All interviews were audio-recorded (Creswell, 2012) with participants' consent. Audio recordings were transcribed verbatim by the researcher via the assistance of InqScribe (Inquirium, 2013), for a more accurate and effective transcription. The final version of the transcripts was reviewed by participants for their approval before analysis.

Document Review

Review of any generated documents is essentially supportive to other instruments being used for this study. Merriam (2001) pointed out that document review could "help the researcher uncover meaning, develop understanding, and discover insights relevant to the research problem" (p. 133). Primary documents collected were the instructor's assessment on learners'

performances in Module 2 and brief SL course evaluation, learners' self-reflections on Module 2 at the end of Session 3, the written assignments for Task 3 in Session 1, and the researcher's observation log. The multiple modalities used for document review provided more objective while thorough perspectives from both instructor and learners to help the researcher better understand participants' actual experiences and performances in the teaching and learning process in SL. A document summary form was adapted from Bloomberg and Volpe (2012) in order to effectively collect and analyze generated documents (see Appendix H).

Data Security and Ethical Assurance

Data were solely collected by the researcher and saved as digital documents (e.g., MS Word document, PDF document, and MS Windows-compatible media files). Data were secured in the researcher's personal laptop and backed up to two external hard drives and three cloud storage services. All documents, devices, and storages were password-protected and not to be shared with a third party. The online survey link was deactivated after the PI successfully collected responses from all learner participants. The VLE in SL remains inactive but can be accessed by invitation link only. Participants were encouraged to deactivate their SL accounts and/or delete their avatars; however, this was not mandatory.

Equally important as research done in real life, studies designed for VWs like SL require the researchers to be responsible for both informing and protecting participants. Although it is anticipated that no serious and obvious ethical threat could occur to the participants and their well-being, the researcher employed multiple methods to safeguard participants' rights. First, the researcher obtained approval from the Institutional Review Board (IRB) at the University of Alabama on all study-related procedures and materials (see Appendix I). Second, a formal informed consent form (ICF) was distributed to each participant. Third, participants' rights and

interests were considered when reporting and disseminating the data. For this study, the data were used for the sole purpose of compiling the dissertation; and, therefore, no further action was taken beyond this purpose. Fourth, unlike in the real world, participant's identity in VW was less identifiable, especially when display names (alias) and avatars were used to represent actual participants. Moreover, their display names are also not revealed in this document and this strengthens confidentiality since avatars in SL can be retrieved by their display names. Overall, as the ultimate goal for research ethics, the researcher was extremely cautious to keep participants' real identities consistently confidential and secure (Corbin & Strauss, 1998).

Data Analysis

According to Merriam (1998), in order to ensure that the data analysis be accomplished in a more accurate and holistic manner, the process for data collection and analysis should be done simultaneously without isolating each other. She also pointed out that qualitative analysis often results in incidences that "cut through the data" (p. 11) and cause researchers to be unable to systematically and effectively associate the data collected with the method they attempt to apply. Stake (1997) warned that qualitative case studies can be too subjective due to over-reliance on researcher's impressions. Hence, in order to minimize or avoid these potential obstacles that might hinder the successful, unbiased and objective analysis, a set of systematic data analysis procedures were established and implemented.

Data Analysis Procedures

In order to ensure the integrity, completeness, smoothness, and effectiveness of the data analyzing process, qualitative content analysis was applied. It is "a catch-all term covering a variety of techniques for making inferences from 'texts'" (Bernard, 1995, p. 339) and "focuses on the characteristics of language as communication with attention to the content or contextual

meaning of the text” (Hsieh & Shannon, 2005, p. 1278). As “one of the descriptive qualitative approaches to data analysis” (Vaismoradi, Turunen, & Bondas, 2013, p. 399), qualitative content analysis was used with the research goal to “describe meaning of materials [and] develop categories or themes” (Cho & Lee, 2014, p. 15).

Research question (RQ) 1. Data were analyzed based on the answers of pre-study survey questions (SQs) and post-study interview questions (IQs) for learner participants (IQs 1, 7, 8, & 9) as they primarily dealt with participants’ experiences that were relevant to their outcomes, attitudes, and motivations before and after taking the SL course. The researcher applied a summative approach to qualitative content analysis that utilized counting and comparisons of the frequently appearing keywords or descriptors identified from the raw data in order to look for the interpretation of the underlying contexts. The summative method started “with identifying and quantifying certain words or content in text with the purpose of understanding the contextual use of the words or content” (Hsieh & Shannon, 2005, p. 1283).

To do so, the researcher first re-read the questions and answers of both survey and interviews, then put survey answers and interview transcripts into TextSTAT (Free University of Berlin, 2014), a text analysis software that can identify the frequency of individual words or specific descriptors that occur in the pre-selected text documents. The analysis unit was based on individual learner participants, so sixteen sets of word lists were created. The researcher then scrutinized these word lists across units, filtered unnecessary but highly used words (e.g., articles, conjunctions, prepositions, and pronouns), and kept the words or descriptors (e.g., nouns, verbs, and adjectives) that were relevant to the RQ1 (attitudes and motivations) and any perceptions shared by the majority of the learner participants. The key words or descriptors included survey items checked by learner participants (SQs 1 – 10), and those identified from the

interview transcripts and in-world observation, such as positive keywords and descriptors (e.g., yes, willing to, sure/surely, and definitely, etc.). At this phase, the analysis was temporarily quantitative (frequency count). Next, as Hsieh and Shannon (2005) have indicated, a latent content analysis should be continued in order to extend the quantitative analysis to qualitative inquiry. Latent content analysis is “the process of interpretation of content” (pp. 1283-1284) and its “focus is on discovering underlying meanings of the words or the content” (p. 1284). The context information is considered as the latent content (Mayring, 2000). To initiate the latent content analysis, the researcher retrieved these selected key words/descriptors back to their original sources and sought for the contextual meanings and rationale they used these key words and descriptors. He employed a values coding method “that reflects a participant’s values, attitudes, and beliefs, representing his or her perspectives or worldview” (Saldaña, 2013, p. 268). This helped the researcher to better understand how survey answers were correlated with the post-study interviews, and his own observation, which reflected learner participants’ actual attitudes and motivations. During this process, several categories were identified directly from the data analysis, which included participative rationales, current English learning, willingness to improve English competency, perceptions of the importance of English competency, perceptions of the significance of educational technology for English learning, perceived advantages offered by SL, overall learning experiences in SL, and future adoption of SL for English learning. Three main themes emerged from these categories: 1) practical motivations, 2) positive attitudes, and 3) consistency of the positive attitudes. At this point, the goal of directed content analysis was “to explore the usage of the words/indicators in an inductive manner” (Zhang & Wildemuth, 2009, p. 309).

The way of ensuring the trustworthiness of summative analysis was to establish the credibility for the analysis, which was done via member check with learner participants to acknowledge their intended meanings of the use of these key words and descriptors, and the researcher's own observation of learner participants' performances as the outcomes of their potential motivations (Petrides, 2006).

Research question (RQ) 2. To answer this question, a *conventional* approach (Hsieh & Shannon, 2005) to qualitative content analysis was applied. It is also called *inductive* category development approach (Mayring, 2000) because “codes, categories, or themes are directly drawn from the data ... [and] prior knowledge regarding the phenomenon under investigation is limited or fragmented” (Cho & Lee, 2014, p. 4). The outcomes of conventional analysis are the themes or categories that are most relevant to the research objectives identified, and for this study, this objective was the learner participants’ experience of learning English for their specific purpose in the VLE of SL.

The researcher followed combinatory procedures suggested by Thomas (2006) and Elo and Kyngäs (2007) to perform the inductive analysis for qualitative data. First, the researcher selected the unit of analysis, which included participants’ interview transcripts and generated documents, and observation logbook. They were re-organized; all transcripts and documents were formatted in the same font and size with labels and titles of the transcripts and documents highlighted. Interview transcripts were charted to make comparison among individual learner participant’s answers to the same interview questions (IQs 2-6). Instructor’s interview transcript was displayed right next to that of learner participants for easy correlation. Second, the researcher scrutinized the data by reading transcripts word by word. This helped him to identify initial codes and texts that “appeared to capture key thoughts or concepts” (Hsieh & Shannon,

2005, p. 1279). During this process, an open coding method was employed, which used “notes and headings [that] are written in the text while reading” (Elo & Kyngäs, 2007, p. 109). The researchers tried to note as many headings as possible, which included how SL enabled learner autonomy, opportunities SL offered for learner participants to be more communicative, interactive, and collaborative, how learners utilized resources in SL to learn both aviation English and content knowledge, the design of tasks for ESP-oriented course, and so forth. When the researcher finished open coding on four interview transcripts (1/4 of total learner participants) that were randomly chosen from four learner participants who did not major in the same program and the instructor’s interview transcript, he identified the preliminary codes that emerged from the text segments. These initial codes were noted on the right side of the transcripts for better comparison and categorization. The researcher continued to code the remaining data. During this process, some new codes were added when data did not fit the existing codes, such as the deficiencies of learning in SL perceived by learner participants and unexpected incidences (e.g., technical, instructional, and learners’ own issues) that occurred during in-class sessions. The researcher also identified some “irrelevant” data, and labeled them as “un-coded” texts. Such data included some transcripts of the voice and text communications between instructor and learners, and among learners, which were irrelevant or less informative (Schilling, 2006). Corbin and Strauss (1998) indicated that when “no new information seem to emerge during coding” (p. 136), the data saturation is achieved. The researcher discontinued coding when data was saturated. Next, the researcher listed all generated codes on the coding sheet in order to conveniently group the similar or relevant codes into meaningful categories. First, fifteen categories were generated. Based on their correlations, these initial categories were re-organized into relatively higher-order categories that eliminated the overlapping, redundant,

and irrelevant categories. The higher-order categories included aviation content knowledge learning, aviation English learning, learner autonomy, learners' interactions with instructor and collaborations among peers, activity and task design for ESP learning, incidences during SL course, and deficiencies and drawbacks of using SL for ESP education. Creswell (2012) advised that the outcome of inductive analysis is to create 3 to 8 summative categories, which incorporate and reflect the most important and key themes toward answering the research questions. These seven categories were classified as subthemes under two main themes: 1) I could learn more in SL than in the classroom, and 2) SL was a “double-edged sword.” The two final themes encompassed all collected data regarding learner participants’ actual experiences of learning ESP in SL.

The validity of the conventional analysis was assessed via *stakeholder checks*, which it “might involve opportunities for people with a specific interest in the research, such as participants, service providers, funding agencies, to comment on categories or the interpretations made” (Erlandson, Harris, Skipper, & Allen, 1993, p. 142). To do so, when interviewing was complete, all participants were allowed to review the summary of the data so they were able to identify any errors caused by the researcher. They were also permitted to modify the interview transcripts and documents they generated. A brief description of the initial findings for RQ2 was also provided to participants for their review and comments, so that the researcher was able to revise the categories or interpretations accordingly.

Research question (RQ) 3. A *directed* approach (Hsieh & Shannon, 2005) to qualitative content analysis was used to answer this question. It is also called a *deductive* category development approach (Mayring, 2000) since the analysis began “with preconceived codes or categories derived from prior relevant theory, research, or literature” (Cho & Lee, 2014, p. 4).

For this research question, the preconceived categories were SL's eight affordances for language learning proposed by Henderson et al. (2012).

This directed approach to qualitative content analysis began with the selection of the unit of analysis. The researcher used the same data sources as for RQ2. Next, the researcher determined the preconceived categories, which were adapted from Henderson et al. (2012), the eight affordances for language learning (see Table 11).

Table 11

SL's Affordances for Language Learning

Affordances	Descriptions and Explanations
affective filter	“Virtual presence can result in reduced apprehension and embarrassment that otherwise can impede experimentation such as through roleplaying” (p. 402).
persistent environments and records	SL like other “virtual worlds are persistent” (p. 402).
physical and linguistic co-presence	“The immersive social environment of virtual worlds provides a range of discourse elements that are generally not available in less immersive environments” (p. 402).
avatar control and learner autonomy	“Students control their avatars to explore and interact, independent of the instructor” (p. 402).
the value of text interactions, even in a virtual world experience	“Virtual worlds such as Second Life can provide a contextually rich environment (e.g. with graphics, animation, audio and text stimuli) that can serve as powerful cognitive aids to text-based interactions” (p. 402).
mediated environment	SL has “the advantages of other simulations in that information can be included and excluded as needed” (p. 403).
context sensitive interactions	“Virtual worlds [e.g., SL] can interact in contextually appropriate ways with learners” (p. 403).
body language	“In language acquisition, body language enhances communication by adding layers of meaning to what is spoken, which can aid comprehension as well as afford opportunities to explore mannerisms and gestures intimately linked with the target language and cultural practices” (p. 403).

The researchers then employed the axial coding method, which was used to identify, modify, and consolidate the final codes for the categories. The axial coding was appropriate when the initial coding cycle was done (open coding), as it aimed to make connections between categories, and move inductive analysis into a deductive approach. During this process, some pre-conceived categories were revised, added, and removed. This was due to the fact that some data could not be coded into one or more of these predetermined categories. For instance, “persistent environments and records” and “body language” were all excluded as none of the data appeared to describe or address these phenomena even though they were identified in previous literature. For the data that could not be coded into the pre-conceived categories, the researcher coded them into new categories, or coded into a combined and refined predetermined categories. The final categories that were presented as SL’s affordances for ESP learning, which included reduced affective filter via avatar and VLE, co-presence of content and linguistic knowledge for CBI, learner autonomy enabled and enhanced by avatar control, convenient and prompt transition from in-class learning to experiential “field-trip,” learning retention and continuity ensured and engaged by multiple task design, practicability due to real-life simulation, learning flexibility, and authenticity of both instruction and resources offered at a distance manner.

The trustworthiness of applying directed analysis for the RQ3 was also assessed via stakeholder checks, the researchers particularly articulated the newly-developed categories (as the affordances) to the participants and explained them with plain Chinese to inquire their consent and/or disagreement on the findings. When they raised disagreements or suggestions, the researcher reviewed and modified the categories accordingly.

In sum, the three approaches to qualitative content analysis employed for this study can be distinguished by their different coding schemes. Table 12 presents the three coding schemes

that were in reference to Hsieh and Shannon's (2005, p. 1286) comparison among above-mentioned three approaches.

Table 12

Coding Schemes Used for the Three Content Analysis Approaches

Research Questions (RQ)	Types of Content Analysis Used	Analysis Started With	Time of Defining Codes or Keywords	Sources of Codes or Keywords	Coding Methods Used
1	Summative	Keywords identification	Keywords were identified before and during analysis.	Keywords were derived from researcher's inquiry and relevance to RQ.	Values
2	Conventional (Inductive)	Reading of the data	Codes were defined during analysis.		Open
3	Directed (Deductive)	Review of previous literatures	Codes were defined before and during analysis.	Codes were derived from existing literatures and research findings. (see Table 11).	Axial

While coding was an on-going process, the researcher also utilized another very important technique in qualitative data analysis, namely that of *memoing* (Birks, Chapman, & Francis, 2008; Charmaz, 2006; Glaser, 1978; Miles & Huberman, 1994; Strauss, 1987; Tesch, 1990) to record reflective notes that the researcher acknowledged from the data and participants. To do so, a data summary table (see Table 13) was developed by the researcher to record and compare individual participant data (e.g., participants' quotes) in a holistic and comparative way. The summary unit was single survey or interview question.

Table 13

Data Summary Table (Excerpt)

Parti-cipant	Corresponding Transcripts	Keywords	Codes	Memo & Audit Trail
<i>Interview Question 8: Are you willing to utilize SL for your future English learning? Please explain in detail.</i>				
1	“Definitely! I’d like to learn in SL if I was given such opportunity.”	Definitely Like to learn Opportunity	Affirmative Availability	The tone & “!” Check his educational background & any consistency of positive expression about learning in SL?
2	“I will give it a try if our school has such course.”	Give it a try Has such course	Affirmative (Conditional) Availability	Review his performance and instructor’s assessment and peers’ evaluation of Task 4 in Session 3.
3	“I am willing to learn (SL) in the future, if there is a more specific course designed and offered for flight attendant like me.”	Willing to learn Specific course	Conditional Availability → Specificity & Relevance	School (administrative level) seems to be one BIG determining factor for implementing SL course. 1. What about academic and personal needs? 2. Must it be implemented at school level or anything else?
4	“Sure, I think I like learning in SL. Once our school realizes its (SL) educational implication, we might be able to have such course in our curriculum.”	Sure Like learning in SL Educational implication Curriculum	Affirmative Administrative readiness vs. Academic readiness	Course design needs to be specific. Content → meets everyone’s need → What about this SL course? → Did everyone reach their goal? → Language vs. content or just language or just content? Similar to P1? Check detail Perception at school level is important, as seen from P2. What kind of curriculum? SL-only or blended?
5	“If I was given such opportunity, I think I would.”	Opportunity I would	Conditional Availability	Her notion seems quite representative among all other LPs. Availability becomes the primary reason for their willingness (positive attitude) to continue learning in SL, in the future.
6	“Maybe I can use SL for future learning. However, this is only possible when I have access to it and it has enough learning resources for me.”	Maybe Access Learning resources	Neutral or uncertain? Accessibility Availability of 1. Course 2. Resources in the SL course	Why “maybe” here, as compared to others? → possible attributes (need to look back to demo info): 1. Personal interest? Professional need? 2. Program enrolled 3. Future plan (If any?) 4. Anything else? Go back to survey questions

Measurements to Ensure Trustworthiness

Triangulation. According to Schwandt (2007), “triangulation is a means of checking the integrity of the inferences one draws. It can involve the use of multiple data sources, multiple investigators, multiple theoretical perspectives, and/or multiple methods” (p. 298). Triangulation ensures both the trustworthiness of the study and the researcher’s broader and in-depth understanding about the phenomenon being studied (Angen, 2000; Kohlbacher, 2006; Morse, Barrett, Mayan, Olson, & Spiers, 2002; Patton, 2014; Sandelowski, 1993; Vogt, 2005), and this is particularly critical for case studies (Merriam, 1998; Stake, 1995; Yin, 2009). This study, triangulation was realized by the use of multiple data sources (instructor vs. learner participants) and multiple data collection methods such as surveys, interviews, document review, and observation (see Data Management Plan).

Member check. Schwandt, Lincoln, and Guba (2007) emphasized that it is important to cross check the data before analysis in order to engage triangulation. Vogt (2005) suggests the use of *member check*, which is “the practice of researchers submitting their data or findings to their informants (members) in order to make sure they correctly represented what their informants told them. This is perhaps most often done with data, such as interview summaries” (pp. 190-191). For this reason, interview transcripts and documents were first distributed to each participant for their review and approval before input for analysis.

Audit trail. The researcher also maintained an *audit trail* (Lincoln & Guba, 1985) that chronicled the development of his thoughts and ideas and documented the rationale for all choices and decisions made throughout the research. To do so, memoing was used for “mapping research activities” (Birks, Chapman, & Francis, 2008, p. 70) in order to ensure the dependability and confirmability of the study (Lincoln & Guba, 1985; Padgett, 1998).

Back translation and reconciliation. Last but not least, due to the fact that not every learner participants responded the interview questions in English, the researcher first translated the Chinese transcripts into English, and then used the translation software Babylon 10 (Babylon Software Ltd., 2015) to translate the English back to Chinese. When back translation was done, the original material in source language (Chinese) was then compared with the back translation to look for any confusion or misunderstanding that needed to be solved in order to achieve reconciliation. By doing so, it engaged additional quality control and ensured the accuracy of researcher's translation.

Researcher's Role in the Study

As the sole and principal investigator in the study, the researcher was responsible for ensuring that the SL course to be delivered successfully. He was also responsible for scheduling in-class sessions, preparing learning and instructional materials, answering participants' inquiries about the study, troubleshooting possible technical issues, discussing with instructor about the instruction, and assisting instructor when needed. However, the researcher was seen an independent observer who was not directly involved in the teaching-learning activities and tasks in the SL course.

Researcher Positionality

The researcher holds a Bachelor of Arts degree in English language and literature from his home country (P. R. China). He has earned a Master of Education degree in teaching English as second language (TESL)/literacy from a nationally accredited university in the U.S. and has also completed all coursework of a Doctor of Education program in second language studies in the same institution.

He is currently enrolled in a PhD program in instructional leadership, with a concentration in instructional technology at the University of Alabama (Tuscaloosa). Over four years' systematic study in the field of instructional design, he is capable of designing interactive course and program in various learning environments including VWs like SL. He can also design quality educational courseware and develop accompanying curricular based on specific learning objectives.

The researcher has been using SL since its debut in 2003 and is a long term "resident" in several major and most frequently-visited premises of SL. He has designed and utilized several virtual learning courses and lectures within SL. He is capable of using Linden Scripting Language.

During his graduate study, the researcher took qualitative courses (e.g., case study and survey research methods) in a sequential manner. He has an in-depth and thorough understanding of the nature, procedures, and techniques of qualitative research method. He has taken graduate level statistics courses for educational research, and has prior experience of practicing and utilizing statistical and qualitative research software such as SPSS, ATLAS.ti, Dedoose, Ethnograph, HyperRESEARCH, MAXQDA, Nvivo, QDA Miner, and Transana. He is capable of utilizing eLearning authoring software including Adobe eLearning Suite, Articulate Storyline and Studio, iSpring Suite, and Lectora Inspire to design interactive, multimedia courseware and online courses. Moreover, he is familiar with multiple learning management systems (LMS) such as Blackboard Learn, ClassDojo, Edmodo, Google Classroom, Moodle, Ning, and Schology.

The researcher has taught English to non-native English speakers (primarily Mainland Chinese) at college/adult level for over two years and Mandarin Chinese to international students

who were from Asia, U.S.A, and Europe for over five years. He also teaches English and Mandarin Chinese online courses to non-native speakers in the formats of instant messaging, video conferencing, and MOOC while residing and pursing higher degree in the U.S. His bilingual (English and Mandarin Chinese) competency helped learner participants to be more engaged in the study as they shared at least one communicative language at a mutually comprehensible level. In addition, being a non-native English speaker himself, the researcher was able to relieve discomfort and strengthen his rapport with those non-native, English-speaking participants throughout the study.

Therefore, based on his broader academic and educational background, and diverse social and cultural experiences, the researcher was seen both an insider to the studied group and situations as well as an outsider, who should maintain a relatively unbiased conduct throughout the study. The researcher took several approaches to maximally reduce some potential biases (e.g., procedural, interviewer, response, and reporting bias). For instance, the researcher clearly indicated the purpose of the study at the beginning of the study; he gave interviewees a relatively relaxed and secure (non face-to-face and individual) atmosphere and flexible schedule and consistently reminded learner participants to perform naturally and answer questions to the best of their knowledge. The researcher also maintained audit trail and observation log to ensure the consistency and accuracy of the data collection and analysis process and gave participants the ability to review and approve the final versions of the documents (e.g., interview transcriptions, assignments, feedback) collected. For those uncertain or ambiguous quotes identified from the documents, the researcher inquired corresponding respondents to ensure there was no misunderstanding and misinterpretation prior to the data analysis.

Summary

This chapter details the rationale of using a qualitative approach as research method and descriptive case study as the type of research design. The research design plan then is laid out including information of study setting, participant background, and criteria for participant recruitment, as well as the limitations that is related to participants. The qualitative data collection and analysis methods are given and explained in detail. The researcher particularly addresses issues such as validity of data analysis, measurements to ensure the trustworthiness of the study, and his role in the study. A complete description of researcher's credential that demonstrates his capability of conducting this study is listed at the end of this chapter.

CHAPTER IV:

RESULTS AND ANALYSIS OF DATA

Introduction

The purpose of this single case study was to explore with a sample of Chinese college undergraduate level students in aviation-related programs their perceptions and experiences of how they utilized Second Life (SL) as a learning platform for English study for their specific purposes. The following research questions guided this study:

1. What are learner participants' attitudes toward and motivations for learning English for specific purposes (ESP) in SL;
2. In comparison to in-class learning, what are learner participants' experiences of learning ESP in SL; and
3. What do learner participants consider to be the affordances of SL for ESP learning?

Data were collected from pre-study survey (learner participants), in-world observations, post-study interviews (for both instructor and learner participants), and document review. Qualitative content analysis method was used to analyze the collected data.

Sample Characteristics

Sixteen Chinese undergraduate students from Mainland China served as the analysis unit for the study. They were all from one comprehensive university in northeast China. Part of the pre-study survey collected demographic information about participants' educational background such as their academic program, existing English proficiency, and their academic or career plans.

Among these 16 learner participants, 11 were male and 5 were female, 14 were sophomore and 2 were junior students. The participants were either 19, 20, or 21 years old. They majored in four different civil aviation-related programs: airliner pilot (n=4), air traffic management (n=4), civil aviation management (n=5), and flight attendant (n=3). According to the answers of survey question 10, none of the learner participants used SL before. The demographics are summarized in Table 14.

Table 14

Learner Participants' Basic Demographic Information

Participants	Age	Gender (M=male F=female)	Programs currently enrolled	Academic levels	Previous experience with SL
P1	20	M	Airliner Pilot	sophomore	No
P2	20	M	Civil Aviation Management	sophomore	No
P3	20	F	Flight Attendant	sophomore	No
P4	19	M	Air Traffic Management	sophomore	No
P5	19	F	Flight Attendant	sophomore	No
P6	20	F	Flight Attendant	sophomore	No
P7	21	M	Civil Aviation Management	junior	No
P8	20	M	Airliner Pilot	sophomore	No
P9	21	M	Airliner Pilot	junior	No
P10	19	M	Airliner Pilot	sophomore	No
P11	19	F	Air Traffic Management	sophomore	No
P12	19	F	Civil Aviation Management	sophomore	No
P13	19	M	Air Traffic Management	sophomore	No
P14	19	M	Civil Aviation Management	sophomore	No
P15	19	M	Air Traffic Management	sophomore	No
P16	19	M	Civil Aviation Management	sophomore	No

Note. P = Participant.

Among the four programs in which the learner participants were enrolled, each program offered four aviation-related core courses, and two of them were taught in English or bilingually (Chinese vs. English) (see Table 15).

Table 15

Aviation-Related Courses Taken by Learner Participants

Participants	Aviation-related Courses	Aviation-related Courses Taught in English or Bilingual
P1	1,2,9,10	9,10
P2	1,2,3,4	3,4
P3	1,2,7,8	7,8
P4	1,2,5,6	5,6
P5	1,2,7,8	7,8
P6	1,2,7,8	7,8
P7	1,2,3,4	3,4
P8	1,2,9,10	9,10
P9	1,2,9,10	9,10
P10	1,2,9,10	9,10
P11	1,2,5,6	5,6
P12	1,2,3,4	3,4
P13	1,2,5,6	5,6
P14	1,2,3,4	3,4
P15	1,2,5,6	5,6
P16	1,2,3,4	3,4

Note. P = Participant. Course number indications: 1 = *Introduction to Civil Aviation*, 2 = *ICAO Regulations and Policies*, 3 = *Airport Management*, 4 = *Extensive Readings in Aviation English (Management & Administration)*, 5 = *Ground-to-Air Communication*, 6 = *Extensive Readings in Aviation English (ATC)*, 7 = *Flight Attendant English*, 8 = *Extensive Readings in Aviation English (Flight Attendant)*, 9 = *Air-to-Ground Communication*, 10 = *Extensive Readings in Aviation English (Avionics)*.

All participants earned at least the minimum “passing” score (550) in the CET Band 4 test, but none of them ever took other standardized English tests or went for study abroad in an English-speaking country or region (see Table 16).

Table 16

Learner Participants’ Previous English Learning Experiences

Participants	CET-Band 4 test scores	Other English exams	Study-abroad experiences (in English-speaking countries/regions)
P1	559	No	No
P2	570	No	No
P3	555	No	No
P4	580	No	No
P5	565	No	No
P6	580	No	No
P7	553	No	No
P8	580	No	No
P9	575	No	No
P10	570	No	No
P11	570	No	No
P12	585	No	No
P13	565	No	No
P14	580	No	No
P15	560	No	No
P16	610	No	No

Note. P = Participant.

Except for P7 who planned to take a long trip overseas with his family after graduation, all other participants indicated intentions of either furthering their education (two wanted to apply to an MBA program), or seeking positions related to their current programs of study (see Table 17).

Table 17

Learner Participants' Future Academic or Professional Plans

Participants	Future Academic Plans	Future Professional Plans
P1		airliner pilot
P2	MBA	
P3		flight attendant
P4		air traffic controller
P5		flight attendant
P6		flight attendant
P7	N/A	N/A
P8		airliner pilot
P9		airliner pilot
P10		airliner pilot
P11		airport executive assistant
P12	MBA (supply chain or transportation management focus)	
P13		air traffic controller HR or logistics officer
P14		
P15		air traffic controller
P16		airport ground administrator

Note. P = Participant.

The following sections include a series of findings for each research question. As Cho and Lee (2014) suggested “the research outcome of qualitative content analysis is the meaning of qualitative material formatted as categories or themes that answer the research questions” (p. 12). Therefore, the researcher aimed to document a broad range of experiences based on the final categories and themes identified and then provided the opportunity for the readers to enter into this study and better understand the participants. The emphasis was to have participants speak

for themselves. Illustrative quotations adapted from answers of survey and interview transcripts attempt to portray multiple participants' perspectives and capture some of the richness and complexity of the subject matter. Where appropriate, analysis of observation and document data are interwoven with that of survey and interview data in order to augment and solidify the findings.

Research Question 1

The first research question asked, "What are learner participants' attitudes toward and motivations for learning ESP in SL?" A pre-study survey probed the factors and rationales that affected their initial attitudes and motivations for participating in the study, right after they had completed the Module 1 SL Orientation. Some of the interview questions also asked about the usefulness of SL after participants had finished the SL course.

Theme 1: Practical Motivations

The learner participants' practical motivation was one of the most influential factors related to their positive attitudes toward learning ESP in the VLE of SL. This is the first theme identified to answer the first research question.

Participative rationales. Although individual learner's actual answers on the survey question (SQ) one varied, none of them participated in the proposed study due to researcher's recruitment or professor's requirement for participation. They had more practical and specific reasons other than simply acting as study participants. This was particularly noticeable from those who did not major in pilot or ATC programs but wanted to study air-communications for certain practical reasons. Two participants were representative of such choices. P3, a sophomore who studies in the Flight Attendant program, explained her reason for participating in the proposed study.

It seemed to me that, at first glance the study had nothing to do with my program. However, as a future flight attendant, you are surely required to at least comprehend the basic communication skills and knowledge used between pilots and ATCs, in case something unexpected or emergent occurs. In addition, since flight crew should be working collaboratively with ground staff, which also requires the mastery of air inter-communication. Unfortunately, we are not taught theses in our program. Therefore, I do cherish this opportunity to see if I can benefit from it.

P16, a sophomore of Civil Aviation Management program, who aimed to get a job higher than that of ground staff (the position many who majored the same program would choose to be), also shared his similar opinion.

If I wanted to get an administrative level job at local airport, I must be knowledgeably versatile, I have to be proficient in every aspect of airport routine, and even if I am not really directly involved in their roles, for example, aviation inter-communication. However, it [aviation inter-communication] is like one hub that connects airplanes and pilots with airport infrastructure, logistic, and all other departments, you can't just be simply good at your own work, you have to be responsible for others, and therefore, you have to know their way of work, their language, their jargons, their field of knowledge, and so on. Everything of others always becomes something that matters you.

Evidently, other learner participants who majored in either Airliner Pilot or Air Traffic Management expressed motivations primarily based on their professional needs. P1, a sophomore of Airliner Pilot program indicated that

We used to be trained as pilots to do role-play of inter-communication with ground control in the class, and I did several in-cabin practice at the airport. However, what we lacked was the actual use of aviation English to effectively communicate in that real-life situation. I was glad to see that Second Life offers such opportunity especially for pilots and ATC to learn and practice the authentic terminology and usage of English for aviation communication. This adds valuable asset to my existing program of study and I do see its benefit for my preparation for a career as civil pilot.

P4, a sophomore of Air Traffic Management program also acknowledged the significance for participating in the proposed SL study. She stated that

I have to admit, as Chinese students, we never had such opportunity before to try something novice and interesting for learning aviation English, which is essentially important if you aim to pursue a position as ATC or ground staff. I believe we have learned something useful in the class, but I am bit skeptical if we can fully utilize what we learned in the class to future work. This (SL) study let us to be more practically

involved in a fully English environment to learn something that is useful for our future career. This is quite rare or impossible in real life.

In sum, professional need became the unanimous reason (n=16) why all learner participants wanted to participate in the study despite the differences in their respective academic programs and educational levels. Other identified rationales for participation included academic needs (n=14) and personal needs or interests (n=9), and they were also related to participants' professional needs. For instance, P2, a sophomore of Civil Aviation Management program, and P13, a sophomore of Air Traffic Management program, both agreed that although they had no intention to work but to pursue a higher degree as MBA after graduation; they still considered taking this SL course a good opportunity for their future career preparation. P2 noted

My biggest motive to participate in this study was because I wanted to see if SL could help me learn more than what I used to learn, and if this learning environment could engage me to learn effectively. The reason I wanted to continue a higher degree such as MBA, is eventually because I aim to get a better job, either in aviation industry or any related field, but I want to have a better start. Academic success and advancement is the pre-requisite for a successful career.

Among all the learner participants, nine attributed the personal needs or interests to be one of the reasons for them to participate in the study. Some of them used key words such as "novice" and "novelty" (n=2), "eye-opening" (n=2), and "interesting" (n=3) to express their particular interests in the study. P12, a sophomore of Civil Aviation Management program, who had no plan of either going to work or furthering education after graduation, indicated his unique perspective participating in the study:

Although I major in Civil Aviation Management, I really don't know if I will be working in this field, or studying in a different area for my postgraduate life. However, by participating in this study, I found something that interested me. This study was really eye-opening, not only because Second Life was novice to me, but also its versatility that could benefit people in multiple ways. My family has business in IT industry, so I was wondering if SL can be referred to inspire more creativity and productivity for me and people who I will be working with, given the fact that, I will eventually find a job that I'd like to devote myself.

Current English learning. Another attribute that led to learner participants' practical motivation for participating in the study involved their perceptions of current in-class English learning in their respective programs, which was primarily unsatisfactory.

Dissatisfaction. According to the answers to SQ 2, among all learner participants, 15 of them expressed being dissatisfied (very dissatisfied=9, dissatisfied=4, and somewhat dissatisfied=2) with their current in-classroom English learning, except for P16, who chose "neutral" in his case. P16 explained the reason for this choice in his supplemental note

I have no particular complaint about our current English learning environment in the classroom and at university level, since I learn English primarily on my own. However, I have to admit, I felt the same as my fellow classmates that we demand a change of how we learn, and what teachers should instruct. So, I do believe that those who do not have a viable learning strategy and medium to effectively learn English would eventually feel uncomfortable and dissatisfied.

Factors leading to dissatisfaction. According to the answers to SQ 3, there were 10 primary negative factors that led to learner participants' dissatisfaction in learning English in a classroom. Among these ten factors, all learner participants (n=16) selected "unenjoyable," "tedious and boring," "exam-oriented," "no English-speaking only environment," "limited/no access to learning resources used in English-speaking countries," and "less autonomous"; while 15 selected "ineffective" and "impractical." Fourteen selected "less qualified instructors"; and 13 selected "less interaction with instructor and peers." It is worth noting that these factors became the primary causes that led to learner participants' determination to find a better way to improve their current unfavorable situations. P16 suggested that stereotypical English education in China has been widely perceived as exam-oriented, lacking of qualified English instructors, and with limited access to authentic English learning resources. He said,

In China, English learning at college level tends to be exam-oriented. I have scored 610 at CET Band 4, which is a bit higher than the average. But what does it mean to me? It only documents that I am so-called proficient in English, the English as the language,

which is required for everyone who wants to get a better job. CET Band 4 used to be one of the harsh pre-requisites for undergraduates to get their diplomas, thanks to the administrators who changed the policy, otherwise many would have failed to graduate with a degree. However, in nowadays China, almost all employers want to see your good performance in CET Band 4 and 6. They consider such exams the proof of your English proficiency, even you might not use it for work or for the rest of your life. (Grins)

We have courses taught in bilingual, but the only reason such course needs to be taught in English is that the textbook is written in English, and currently no Chinese translation is available. So instructors have no option but teach in both languages. The Chinese is overly used because the English content cannot be fully understood by the students. I believe my instructors are experts in their respective fields. However, due to their limited proficiency of professional English used in that subject, they might not always be able to deliver the class accurately and effectively. I have found many times that one of my instructors misused two or three terminologies and concepts due to his unfamiliarity of the original meaning of those content in English. You might ask why I was so sure that he'd made such mistake, because I've read the original sources sent by my friend who currently studies in the U.S.A, and unfortunately, we have no access to such resources in China, even via the internet, you know the reason [block of internet]. (Smirks)

P5, a sophomore in the Flight Attendant program, also complained about her particular situation of English learning in the current program. She noted,

Everyone including my parents thought that my future career would be a flight attendant, which many young and pretty girls would envy. And surely I am also excited in hope to become one. However, what I am trained somehow does not prepare me to become a qualified and competitive flight attendant. The textbook we use is out-of-date, which was compiled by a publisher who I don't know whether they are authoritative in the civil aviation or not. And the instructor who teaches flight attendant courses is a Chinese native who has little bit awkward accent. I am from Beijing with no obvious accent in both Chinese and English. Always I feel uncomfortable and distracted from a non-English native instructor who insists on teaching in English. ORZ [Emoticon to symbolize frustration]!!!

In fact, I like chatting with English native speakers, it's better to learn from them even they are not expert, at least, their language is authentic, and that is enough for me. We used to have so-called "English Corner" where you can practice oral English with native speakers. And now since we've moved to the new campus that's far away from downtown, therefore, we no longer have such opportunity. So I tried to utilize the internet to find someone who can help me with my English learning. However, the internet is not regularly monitored that too much useless information emerges on the daily basis and I don't have the ability to filter out what I need. Thus, it becomes time consuming and ineffective. Moreover, during most of my extracurricular time I just tried hard to memorize aviation vocabulary without actually practicing them, since we are only required to get higher score in the exam, and that is it! I don't see much of the benefit of

learning English for my future career if we keep doing and never change. I think there is better way, and I need to find it!

P14, a sophomore in the Civil Aviation Management program, pinpointed the negative aspects of his English learning in the classroom deeming them impractical.

Aviation English is essential in my program, especially when I strive to get an administrative or HR job at an international airport. I don't think I can be fully equipped with the knowledge and skills necessary for such competitive position when I graduate from my program. This is because the program I am enrolled does not provide sufficient useful information and experience for the position as airport officer. It does teach us how to deal and communicate with international airline personnel and pilots, but rarely do we have opportunity to practice in real-life situation. Part of the reason I believe is the high cost and limited availability of such internship. I strive to find a better source to enhance my use of English for professional advancement, not only to pass any English exam, including those required by ICAO, although I have to admit we all need to pass the exam, it's the "knocking brick" [stepping-stone to success] to get a good job.

Theme 2: Positive Attitudes

Overall, the learner participants demonstrated a positive attitude toward learning ESP in the SL. This is the second theme that was identified to answer the first research question. The positive attitudes were attributed to learner participants' willingness to improve English competency and the perceptions of the importance of English competency.

Willingness to improve English competency. According to the answers to SQ 4, all learner participants unanimously committed to take whatever action was needed to improve their current English learning by selecting "yes" for this entry. P1 recognized the study could help him find a possible way to improve his English learning, and he noted via QICQ:

Never have I imagined that I could be part of the study, and I was so lucky enough to be eligible for the study. I personally perceive the unexpected and unideal situation that as college students, we are eager to find a way out of the dreadful leaning process when English competency is essentially demanded. Therefore, even we do hate learning it as either a subject or for certain qualification, we have no choice but face it. As one of the participants, I might not precisely represent other participants, and all who did not have the opportunity participating in the study, but one thing I am pretty much sure is that many of us are desperate to look for a new perspective on learning English, which is less painful and more effective.

Perceptions of the importance of English competency. In addition to their willingness to improve their English competency, learner participants also acknowledged their perceptions of the importance of such competency in regards to three more specific aspects: academic, personal, and professional benefits.

Academic benefits. According to the answers to SQ 5, the academic benefits of learning English in the learner participants' current programs, included benefits for English standardized tests (n=10), personal need/interests (n=9), and professional need (n=16). It is worth noting that, although, currently there is no written policy issued by China's Department of Education that requires undergraduate students to pass the CET 4 as one of the graduation requirements, learner participants were still required by their school to take this exam and get at least a passing score. Therefore, higher competency in English would greatly ensure one's better performances (by scores) on the exam. In addition, English proficiency was also considered the pre-requisite for studying in an English-speaking country, as indicated by both P7 and P12. The personal and professional needs or benefits of English competency are detailed below.

Personal benefits. According to the answers to SQ 6, the personal benefits of English competency included the ability to socialize with English native speakers (n=4), the capability to read/watch/browse/listen to English media such as books, music, movies, and websites (n=6), the ability to travel to and live in English-speaking countries without language barriers (n=3), and English broadening one's horizon and world view (n=3). P3 summarized the abovementioned personal benefits.

In my eyes, the personal benefits of English competency for a non-English native speaker, are quite reflected in how one uses it to extend the life experience of what he or she used to have. For me, English competency first serves as the "eye opener" to the larger world that is expressed, perceived, and understood in English, as the sole or primary communication medium. Chinese might be the mostly spoken language, but it is definitely not the globally used language. Therefore, English helps me reach more people

who are or not the native English speakers, given the fact that Chinese is much harder than English, therefore, it can't be a world language. Based on this, the more you are proficient in English, the more media and information you are able to process and comprehend. You are able to directly understand the content and in-depth meaning of original English books, magazine, newspaper, movies, and music. And when we have accumulated considerable information and resources via these media, we begin wondering what the life would look like in the other side of the hemisphere, which used to be a "grey zone" to us. Again, the English plays an important role in connecting us to the outer world. By doing so, your world view is expanded, and eventually, we can achieve what we always emphasize and strive for, a broadened horizon in life.

Professional benefits. According to the answers to SQ 7, learner participants' perceptions of English competency for their professional benefits included two aspects. First, working in an aviation-related position usually requires English competency in order to fulfill and achieve a given responsibility and task (n=16). This was more obvious for those who wanted to work in an international airport or airline. As P1 noted,

English is the only or mostly used language in civil aviation, especially if you are flying international airlines. It's required that pilot needs to use it to communicate and receive information from ground control. If I am proficient in English, I can apply for multiple positions as pilot, and I can fly more international airlines.

P15, a sophomore in the Air Traffic Management program, had similar thoughts about the significance of English competency for his future career and mentioned that

English is our official language when we are communicating in international airlines. I have seen many tragedies that were caused by the misunderstanding of pilot's English or inability to communicate correctly and properly with traffic officers on the ground. So I think it's fundamental and essential for us, as future air traffic controllers, not to only understand but master aviation English so we are better equipped to be able to work safely and effectively.

P8, a sophomore in the Airliner Pilot program, shared his understanding about the relation between English competency and career.

I think English competency is quite demanded as ICAO requires all non-English native speakers to pass the exams, though we as students don't need to pass this exam at school, we still need to pass it when we enter into respective employers. Those employers are picky when they know you are not English native speakers, because they have to pay you to take class for ICAO English tests. If I am competitive in aviation English, I will feel

less threat from other future pilots. I know many of my classmates are better than me in English, so there is no excuse for me not to learn it well.

Second, generally speaking, many employers in China often require certain credentials for English proficiency (e.g. CET 4 scores, oral English proficiency test, etc.) as one of the very important criteria when hiring or promoting an employee (n=9). Therefore, English was seen an incomparable asset to enhance graduates' professional competitiveness among their peers. P11, a sophomore of Air Traffic Management program, shared a personal and thought-provoking story of how she envisioned English could benefit her.

My father used to work as a logistic worker at the local airport in my hometown for nearly 30 years until retirement. He didn't have much opportunity to be promoted due to the fact that he could not communicate with international customers in English. English is more and more used as the working language at international airports. Our local airport began to welcome foreign visitors several years ago, so I think English competency is a valuable competency if you want to get a decent job in civil aviation industry. I want to excel my dad as I want to get a position like executive assistant, which is well-paid and much respected, without too much peer pressure. You see, I am a girl who has to strive and compete with male colleagues in the future. I am not a feminist, but I have to admit that, girls have less competitiveness than boys. So I have to speed up, I have to do much better than my fellows. There is no way for me to get this job if I can't master English and well utilize it, given the fact that, many of my classmates are really good at English. I mean not only for the test score, but really good at using it.

The above-mentioned participants represented the overwhelming majority of learner participants who perceived the professional benefit that English could offer for either career pre-requisite or advancement.

Perceptions of the significance of educational technology for English learning. The third factor related to learner participants' positive attitude toward learning ESP in the SL was their perceptions of the benefits of educational technology (ET) for their English learning, and perceptions of SL as one type of ET.

Benefits of learning English with ET. A brief introduction and explanation of what made SL one type of ET and how SL can be utilized for English learning were given to learner

participants during SL orientation. According to the answers to SQ 8, learner participants perceived several benefits that educational technology could offer for their English learning, including that SL was effective (n=13), enjoyable and fun (n=16), engaging (n=14), that it reduces anxiety and pressure (n=14), and enables more autonomy (n=15). These benefits and advantages were in contrast to learner participants' previous in-class experiences. P7, a junior in the Civil Aviation Management program recalled how he studied English in the classroom.

I still can picture how we used to learn English. It all started with everyone reading the textbooks word by word, searching vocabularies that we didn't know, and attempting to connect the linguistic meaning between English and our mother tongue [Chinese], and ultimately, preparing for various English tests. We overly rely on textbooks, even though it was dull, unpleasant. And everyone didn't dare to ignore learning it well, because we all know that English competency is seen more than a foreign language but an invaluable asset for personal growth, both academically and professionally.

Although there is limited multimedia and internet resources that are suitable for us to learn English, however, we just could not figure out which ones are authentic and helpful. Many of my classmates have personal computers, tablets, smart phones, and MP3 and MP4 players, and they use them to improve their English competency by watching English movies, listening to English music, and browsing English websites. It seemed effective and interesting at first, however, the lack of clear objectives and instruction, self-learning with these high-tech stuffs becomes less effective and disoriented.

P9, a junior in the Airliner Pilot program added that

Given the fact that, even you have a positive attitude toward learning English for your own sake, you still face some negative factors, such as the rigid requirements for English tests and inadequate support from instructors. Therefore, some of my classmates were even willing to sacrifice time demanded for studying other subjects so they can concentrate more on learning English. Because it is true that we overly care about the exams, some might feel tired of attempting higher scores, which, has eventually led to their own pressure and peer pressure, because all worked very hard on English. At this point, many of us are described as "headless flies" who had no own right to choose what to learn and what best fits our needs.

P2 also highlighted the unfavorable situation of in-class English learning based on his own experience. He noted that

I have always been wondering, as adult learners, why we can't enjoy learning English as those kids do. There are so many English programs in China that are designed for

younger learners, which intrigue their interests as well as encourage them to explore more on their own. My little brother always brags how much new stuff he's learned from illustrated textbooks and multi-media resources. On the contrary, what we used to learn is full of tedious and out-of-date information, with monologues and lengthy texts. I like seeking some useful resource from the internet, but I also face the embarrassment that the blockade of internet and censorship have made my effort less effective, sometimes quite in vain, so not to my expectation, I always ended up sticking to what the teacher offered.

Perceptions of SL as one type of ET. According to the answers to SQ 9, among all learner participants, 12 considered SL a VLE (as one type of ET), and a few (n=4) held the view that SL was an online game and a VLE. However, none of them simply considered SL a purely online game or entertainment entity that had no educational value. P9 used term “double-edged sword” when he noted,

I believe that many of us might firstly think SL as an online game. From the orientation we knew that SL's original idea was for entertainment. However, it's really up to individual user. If you'd like to use it for learning, it does help you that way. Unlike many other video or online games I've played before, SL has no clear definition or goals for me to win over others. In another word, you don't or can't earn something by simply “playing” in the SL. I think for younger users, they are at high risk of getting “lost” in the world, especially if they are novice to SL. So SL to us is kind of double-edged sword, it's all about who uses it. I do enjoy both of its educational and entertaining values for sure. However, if you want to utilize it for study, you'd better initiatively confirm with yourself that you will be using it for learning, not playing.

Theme 3: Consistency of Positive Attitudes

The learner participants held consistently positive attitude toward learning ESP in SL not only prior to and during the SL course, but also after they had completed the study. They held positive attitudes toward learning ESP in SL and believed that SL was better than in-class learning.

Perceived advantages offered by SL. SL's advantages for both English and content knowledge learning were acknowledged by the majority of the learner participants. Table 18 is the summary of learner participants' perceptions of the advantages SL offered.

Table 18

Advantages of SL Perceived by Learner Participants

Advantages of SL Perceived by Learner Participants	Number of Participants Perceived (n=)
Autonomy	15
Authentic instructor/resources	13
Availability & Consistency	2
Distance/mobile learning	3
Engaging	4
Fun & Interesting	4
Free admission	2
Resourceful & Informative	6

Learner autonomy and authenticity of the instructor and resources were the two mostly perceived advantages SL offered, as they are also what traditional in-class instruction has always been insufficient. As P7 pointed out,

I believe that the ability to control our own learning [learner autonomy] exists in every type of learning environment, but not every environment offers equal or adequate autonomy to its learners. Traditional in-class instruction has long been discontented due to its inadequacy of individual attention, which is one of the very critical aspects in regards to autonomy, and consequently, learners who were sieged in such a “cage” tended to demonstrate a bewilderment toward learning objectives and uncertainty about their performance, since the constraint and limited condition that they could not enjoy a relatively higher autonomy.

P15 also explained his view on learner autonomy.

Learner autonomy does not mean absolute freedom in the learning process. My understanding is that, as a learner, I am able to be engaged in the learning process by actively searching and selecting available resources and tools to solve and fulfill an executable problem, task, or project that is relevant to the designated learning objectives.

He further distinguished the difference between learning in SL and in the traditional classroom, as it relates to the relationship between learner autonomy and the authenticity of instructor and resources.

I believe I used to be given certain degree of autonomy in classroom, but such autonomy was limited and restrained by the lack of authentic resources and inadequacy of instructor's expertise in the field, which I do think there's an urge for a change. On the other hand, SL just offered me such opportunity. In SL, I was given relatively higher freedom so that I could dive into the virtual world with the goal of seeking necessary information, knowledge, and skills, etc. that were supposed to be comprehended or mastered. And during this process, I kept in mind that, all what I've learned here, would be tested or utilized sometimes in the future. Bear that in mind, I felt that I became an active learner, and I tended to value the great opportunity learning in this SL course, because I know I might not have the same experience to learn something authentic, resourceful, and practical in real life or classroom.

Overall learning experiences and goals achieved in SL. According to the answers to IQ 7, with the perceptions of multiple advantages SL offered for their English learning in the VLE of SL, all learner participants indicated that they achieved the specific goals set at the beginning of the SL course. Generally, these goals were represented in two aspects. First, they wanted to learn aviation English and inter-communication knowledge via SL. This was the goal that most learner participants achieved. P4 indicated that

I took this course with the goal of seeking how SL can benefit my learning, both aviation English and inter-communication knowledge. I believed that I did achieve my goal, though it's not to my utmost satisfaction. However, I did learn some knowledge about aviation communication that was never taught before.

P9 also recognized SL's capacity to help him acquire the necessary knowledge and gain experience in the field of aviation inter-communication. He noted that

SL is one of the useful tools for simulating real-life scenarios that we will be encountering in civil aviation industry. SL is such an ideal alternative way that provides us real life simulative learning without paying much or commuting between classroom and airport. I suggest every pilot program should be equipped with such interactive course.

Second, they wanted to discover SL as a new approach for learning English. Few learner participants (P2, P6, and P12) also indicated that they discovered a new way that they believed beneficial for their future English learning. P2, who planned to pursue a higher degree, said,

Although after graduation, I aim to earn my MBA degree without directly going to work in civil aviation industry, this course somehow helped me a lot by establishing a new way of learning English that's interactive and effective, this is beneficial for my future study.

P6, a sophomore in the Flight Attendant program commented,

Learning via those authentic materials such as video and PPT presentations gave me a new vision of how I should learn aviation English. I think SL helped with my English learning in the way that it provided those invaluable resources that were hard to find before.

Similarly, P12 mentioned,

Speaking of English learning in the SL, what mostly benefited me was that learning English in SL seemed distinctively advantageous. It offered me a flexible way of learning English with authentic materials and native speaker, and a learning environment both are always unavailable or insufficient from my in-class learning.

Future adoption of SL for English learning. According to the answers to IQ 8, all learner participants (n=16) expressed a willingness to use SL for their future English learning. It was observed that those who majored in the Airliner Pilot and Air Traffic Management programs demonstrated a more explicit and direct willingness than those in the Civil Aviation Management and Flight Attendant programs. For instance, P1 used “Definitely!” to express his obviously beneficial and enjoyable experience because he thought “such course was specifically designed for” him. Similarly, P9, who also majored in the Airliner Pilot program, said, “I am eager to see such SL course to be offered in our school.” On the contrary, participants in the Civil Aviation Management and Flight Attendant programs expressed a more indecisive and conditional willingness. P6 said, “Maybe I can use SL for future learning” because she thought this could be only possible when “it has enough learning resources” for her. And P14 emphasized that her willingness of using SL for English learning was based on the condition that such a course should be “full of authentic materials and native English speakers as instructors.”

In addition to their willingness to adopt SL for future English learning, the majority of the learner participants (n=11) also indicated that SL courses must be available to them, either

offered by their program/school (n=6), or they had other access to these resources (n=5). As P16 pointed out,

I believe the availability of such SL course could become the biggest issue, since it needs time, people, and money. This cannot be done by a single teacher or student, it requires the collaboration of school, instructors, and experts who can design such SL course. And more importantly, technical support. If this could be solved, I am happy to have such learning opportunity.

Also, some learner participants (n=4) who majored in Civil Aviation Management and Flight Attendant programs indicated that the subject and learning objectives could be more relevant or appropriate to their specific programs, even though aviation communication is seen as an essential subject for almost everyone who works in the civil aviation industry. As P3 noted, “I am willing to learn in the SL in the future, if there is a more specific course designed and offered for flight attendant like me.” Similarly, P6 suggested, “I am glad to see if there is any course designed for flight attendants. Or it could be a comprehensive course for everyone who majors in aviation-related program.” Moreover, P7 mentioned, “I’d like to see some courses that are taught for aviation management or business.” P12 also expressed, “I am also optimistic and willing to see if other aviation-related programs, such as civil aviation logistics and customer service, to be offered and taught in such environment.”

Moreover, two learner participants (P8, P13) suggested that there should be an incorporation of existing curricula with SL course, as P8 explained, “I hope such learning approach [SL] could be incorporated into our existing curriculum, so there is no greater gap between familiarizing and using it.” And, P13 noted,

I am willing to learn with both format, SL and in-class, this is because we get used to learn in the classroom, and I don’t think I can totally abandon the old approach [in-class learning] and embrace the new one [SL], it is time consuming and unwise.

According to the answers to SQ 10, none of the learner participants had prior experience with SL, either playing or learning in it, and none had ever taken an online course in their respective programs before, either synchronously or asynchronously (according to the answers to SQ 13). After their completion of the SL orientation and course, they still held consistently practical motivations and positive attitudes toward learning aviation English for primarily their professional purposes in the pre-designed VLE of SL. This was obvious from those who majored in the Airliner Pilot and Air Traffic Management programs. As P9 indicated,

In my opinion, SL is one of the most useful tools for simulating real-life scenarios that we will be encountering every day, if we wanted to work in civil aviation industry. SL is such an ideal alternative way that provides us real-life simulative learning experience without paying for more expensive cock-pit simulators. Although the latter two are seen equally essential, SL plays an important role that can supplement or reflect what we learn from other sources. Therefore, I suggest every pilot program should offer such interactive course.

P11 also noted,

SL saves us much time commuting between the classroom and airport as we used to do for a field trip. Given the fact that, we did the same routine in the virtual ATC tower as in the real one, there seems quite economical to learn from your computer. I am not saying that there is no need to sit in a real ATC tower, but the opportunity SL offers does enhance our understanding and experience, meanwhile reduces the cost and risk that could occur in real life.

On the contrary, those who majored in the Civil Aviation Management and Flight Attendant programs also recognized SL's capacity for helping them achieve specific goals, which was primarily due to the consideration of future professional development or career advancement. For instance, P12 wrote, "I knew the primary objectives for the course were aviation communication, but as a future administer on the ground, mastery of such communication skills is highly demanded." And, P3 also added, "Frankly speaking, I did learn something that I wanted, such as air inter-communication skills and essential terminologies and

phraseologies for successful fulfillment of such communication. They are equally useful and crucial for flight attendant to master.”

In sum, learner participants’ practical motivations were based on the fact that they considered their in-class English learning as ineffective, unauthentic, boring, and less autonomous, so they were eager to look for an alternative way of learning English. Their positive attitudes toward learning English in SL were attributed to learner participants’ beliefs that English could benefit them either personally, academically, or professionally. With such consistently positive attitudes throughout the SL course, learner participants perceived the use of SL for their ESP learning to be authentic, autonomous, fun, interesting, less boring and restricted, and engaging.

Research Question 2

The second question asked, “In comparison to in-class learning, what are learner participants’ experiences of learning ESP in SL?” Data were collected and analyzed based on in-world observations, interviews with all participants, instructor’s assessment, and document review. Several findings were identified to address this question.

Theme 1: I could learn more in SL than in the classroom

Throughout the study in the VLE of SL, learner participants shared their actual experiences with regards to content knowledge and aviation English learning, learner autonomy, their interactions with instructor and collaborations among peers as well as the perception of activity and task design for ESP learning. The first main theme then was emerged, which represented learner participants’ general consensus that they believed learning in the SL tended to be more productive and effective than their previous in-class learning.

Aviation content knowledge learning. The content knowledge learned from the SL course was primarily based on the implementation of the CBI lesson plan (see Appendix C). It focused on comprehending, reinforcing, and utilizing English-based information and resources on civil aviation communication and was adapted and modified from sources of authoritative and administrative organizations, such as FAA (Federal Aviation Administration) and ICAO (International Civil Aviation Organization). Due to the fact that learner participants were from four different aviation-related programs, the learning outcomes tended to be divided into two categories. First, those who majored in Airliner Pilot and Air Traffic Management considered learning aviation inter-communication from SL course little more than a review and supplement to their previous knowledge and experience. They were able to reflect and compare with what they previously learned. As P15 wrote,

Some of the topics (such as policy, procedures, and information of inter-communication) covered in this course were those I've learned before. However, I learned them in Chinese with a Chinese instructor. I might ignore or misunderstand something, provided they were primarily written English and distributed to English speaking countries. Luckily enough, the instructor in SL gave me the opportunity to reflect my previous learning, as well as enhance my comprehension and correct the misunderstanding caused by previous in-class learning.

P1 attributed the content knowledge learning in the SL to be more reflective and authentic.

It was a great opportunity to learn from an English native speaker who had expertise and in-depth knowledge in civil aviation communication. I've gained some new knowledge and professional insights of what I used to pay less attention to or just ignored, and the instructor helped me demystify my misunderstanding and misuse of the communication techniques required by a pilot. Moreover, being taught be an authentic expert in the civil aviation industry was definitely a guarantee that what we learned was up-to-date and accurate.

Second, for those who majored in Flight Attendant and Civil Aviation Management, there was a concern about as least acknowledging the fundamentals of aviation inter-communication. As P14 indicated,

I had a thorough understanding about inter-communication procedures and system mostly situated in civil airport, where I aim to find a job such as human resource officer or logistic expert. Therefore, the content knowledge that I learned from the course was valuable asset that could be used or referred sometime in the future, since inter-communication is demanded for most of us who work in the same airport, on a daily basis. Even if you are not directly engaged inter-communication, you are still supposed to know and understand the norms and procedures, when needed.

P3 shared her view on the necessity of learning practical knowledge in aviation inter-communication. She commented,

As a future flight attendant, you will never expect something disastrous to happen due to the miscommunication or improper procedure during a normal contact. Hence, as the onboard member of the flight crew, we also need to master the techniques of effectively initiating and succeeding valid contact with ground control. This could be life-saving skills, even though we were never taught at school.

The instructor provided an overall assessment on learner participants' performances and outcomes. He indicated,

I was glad to know that the chosen topic was quite popular among these SL students. Their clearly defined goals and motivations ensured that they were able to be devoted more effort into the learning process. Many gave me feedback and thanked me for my expertise in civil aviation inter-communication, which they thought critically important and necessary, not only for their program of study, but also for their future professions in civil aviation-related positions.

With well-designed virtual learning environment in SL, those learner participants were able to actively participated in almost every activity led by me and tasks demanded to be fulfilled. They showed a great amount of confidence and attempted to overcome shyness, nervousness, and reluctance that I've seen quite a lot from other foreign students from my classroom. For instance, P4 raised the awareness of aviation miscommunication and misunderstanding caused by non-native English speaker's accent. He exemplified himself, and evaluated and proposed possible solutions, the rest of the class also contributed to the discussion, and appreciated his effort. Such brainstorming activity greatly engaged everyone into the process of reflection, peer review, and collaboration toward the designated subject or topic. With all other appropriate activities and accomplishable tasks, students perceived that they did learn something new or more than their previous in-class learning.

Aviation English learning. The aviation English acquired from the SL course was primarily based on the implementation of the CBI lesson plan (see Appendix C). It focused on

distinguishing, comprehending, and utilizing terminologies and phraseology accurately and appropriately in order to initiate and respond a series of valid yet effective inter-communication between pilots and ATCs. Some of the participants from all four programs shared their positive experiences that were mostly representative of the majority of the learner participants. For instance, as P1 noted,

Through this course, I became more familiar with the internationally recognized standards and procedures when executing the inter-communication. I was able to correct some mistakes that I have made before. SL offered me such a valuable opportunity and experience that might not be enjoyed in real life.

P4 mentioned,

I was able to learn and understand the complete communication system that I did not have the opportunity before, due to the fact that we were not allowed to practice in a real ATC facility unless we are in senior year, and not everyone had such opportunity since it heavily depended on airport's availability. So, I did cherish this SL experience as the preparation and preview for future study and work.

Seen from above statements, the learning of aviation English in SL tended to help those who majored in Airliner Pilot and Air Traffic Management better acknowledge and reinforce their previously learned knowledge in the related field, in a more systematic and authentic manner. On the other hand, those who majored in Flight Attendant and Civil Aviation Management also actively utilized the opportunity to be knowledgeable about the aviation inter-communication, as they perceived the significance of such ESP could also benefit for their professional growth or advancement. P16 pointed out that

Aviation English is more specialized and technologically oriented, it seems less related to my future job as a ground staff in the airport, but I think it should be mastered for anyone who works at various levels of airports, especially, the international airports. Because every staff on duty should take passengers' safety as their priority. And this is why I wanted to take this course, I believe that I have established such awareness and gained knowledge via this course.

P3 also indicated,

As I mentioned before, the significance of aviation English for inter-communication is critical and essential as all other aviation-related professional English, not only should pilot alone to master it, but also every flight crew member onboard should at least acknowledge it. When an airplane is in its route, you cannot predict what will be happening. So for the safety consideration, I needed to learn it.

The instructor assessed learner participants' overall performance, he noted,

Generally speaking, everyone did a great job going through all 3 sessions, they were able to actively utilize available resources and paying greater attention to details. Their belief and concerns for a safer and effective inter-communication have proved that they were well aware of the importance of such communication to the civil aviation safety, which is the ultimate goal for all personnel in the civil aviation industry.

They've tried their best to complete all hands-on tasks, which tested their actual capability of utilizing what they learned from my lectures and presentations. As non-English native speakers, they inevitably made some mistakes, but they were willing to seek help, initiate inquiry, collaborate with their teammates, and review on others' performances, as well as self-reflect their own works. For instance, for the writing assignments, students actively sought useful information and resources provided by the researcher, and drafted the essays together. They revised and discussed before submission. I got assistance from the researcher for evaluating writing assignments, because of his expertise in TESL and as student pilot, so this greatly reduced my workload. We tried give feedback during the intervals, so students could review and retrospect in time, which ensured their continuous autonomy and engagement.

The way they learned English for aviator communication through the SL enabled them to cultivate a habitual behavior, which they kept seeking for solution before asking the instructor and others. This increased their autonomy and willingness to learn something systematically. I've seen some students utilize SL for asynchronous learning, which expanded their in-world experiences back to their real life scenarios. They told me that English became an interesting subject not only because of its linguistic features, but also the pragmatic aspect that benefits them. The significance of collaboration and individual contribution were also acknowledged by these students. In a long run, it is a good start for them.

Learner autonomy. The learner autonomy perceived by the learner participants in the SL was multifaceted. First, there was the autonomy to learn within a relatively free domain. Learners were physically unrestrained as compared to in-class learning. Many indicated that

they were joining the SL sessions from multiple locations such as dorm, library, and even home.

As P7 mentioned,

What I liked most about the SL course was that I could learn wherever I wanted, as long as I have my laptop and access to internet. Admittedly, the availability of internet connection somehow did limit my mobility, but it was more comfortable than sitting in the classroom.

Second, there was the autonomy to initiate the interaction and communication with instructor.

Although the sessions were led by the instructor, learner participants were given optimal privilege to raise questions, concerns, and proposals to anyone in the virtual classroom and field trip. P8 praised it, thusly,

I really liked the atmosphere in SL, the instructor was quite friendly and always cared about if you did learn something. Due to time limit, I could not fully comprehend the lecture in-class, but I was able to inquire during the intervals. As part of the SL course, the asynchronous communication was seen essential as the in-session, synchronous communication. Even I waited a few days later, I still could get replies from the instructor via SL messenger.

Last but not least, there was the autonomy to freely seek solutions, engage in collaborations, and search for both internal and external resources and assistances. As P4 indicated,

In contrast to in-class learning, SL gave us an incomparable convenience and benefit by integrating accessible resources onto the same platform. I liked the YouTube video presentations quite a lot, not only because they were relevant to the learning objectives, but more importantly, I did not have to search and collect on my own, given the fact that, YouTube has been blocked in China for years. Moreover, we were encouraged by instructor to collaborate on a given topic such as role-playing, although we used to do it in class, we did not take it seriously, we did it just because we were required to do so. However, in SL, the design of this and other tasks trained us with specific purposes, and by doing so it could cultivate us to actively seek for a possible solution by ourselves, which was rarely appreciated in previous in-class learning.

The learner participants and also the instructor acknowledged that the level of learner autonomy increased rapidly throughout the SL course as compared to their previous in-class teaching-and-learning activity. Such a transformation was attributed primarily to the interactions between instructor and learners, and collaborations among learners. The instructor noted that

It has come to my attention that, SL learners demonstrated more autonomy than my in-class students, primarily because, like I said before, they [SL learners] were immensely engaged in the interactions with me and peers by using multiple communication methods and completing a considerable and consistent pre-designed tasks. On the contrary, my in-class students did not commit themselves to autonomous learning, even if they were given the opportunity to inquire and seek for solution, or collaborate via a given topic or project. The two learning models were centrally distinct by their degree of foci and attention to learner autonomy.

Learners' interactions with instructor and collaborations among peers. The interactions and collaborations that occurred in the SL course were multidimensional. It included voice, motion, and text communications initiated and exchanged by an individual user's avatar. The interactions were initiated from instructor-led activities to the completion of in-class and on-going tasks (during the intervals). Unlike traditional in-class instruction, students were mostly "passive listeners" (quote from instructor); there was limited opportunity for students to respond and instructor to provide feedback. Under such a teacher-centered mode, the instruction tended to be "one size fits all," said the instructor, "and most of time, you can't take individual attention and need into consideration to help them become active 'speakers' and 'doers.'" The instructor expressed his opinion and comparison between the teacher-centered and learner-centered approach.

My in-class students preferred learning in a teacher-centered style so that they were better guaranteed that all possible questions that might be tested were covered by my lectures, so they were at better chance to earn the pilot license. Learning was realized when everyone paid close attention to what I lectured. On the contrary, in SL, relatively ample autonomy was given to learners that offered them with more opportunity to seek enduring and emerging information and resources that were relevant to their real-life situations and contexts. So they became active learners who held clear goals and motivations other than simply earning certain aviation credential. Surely, such credential is equally important for those who aim to enter the civil aviation world, but at current level, what they needed most was to consolidate and but what differed them from my in-class students, was that SL learners tended to utilize multiple skills of inquiry like interaction, collaboration, critical thinking, self-reflection, and problem-solving and so forth, to acquire new knowledge and skills. I felt my role was not only to give tedious lectures but more importantly, to facilitate the class.

From the perspectives of the learner participants, several complained about their previous in-class learning experiences. P7, the only learner participant who did not reveal his future plan, explained his take on traditional in-class English learning.

Almost everyone who used to learn English in the traditional way [in-class] says that, it is not ideal to learn in a teacher-centered approach. In such classroom, teacher stood in front us and kept talking all the time without waiting for response from and giving feedback to the “silent audiences” [the students]. And as learners we became less autonomous and more passive about what we learned, what we were learning, and what we were about to learn, but rarely did anyone explicitly tell the reason why it’s not good. To me, I think the biggest caveat and reason that teacher-centered learning prevails in China, is that we tend to make instruction “a cut with one knife” [one size fits all] for the students, without considering the practicability and applicability of the knowledge, experiences, and skills to be acquired.

However, what I’ve experienced in the Second Life was that, in such environment, I was able to learn under the guidance of the teacher while actively seek what I needed most. I was given opportunity to prioritize my learning and maximize the outcomes, by actively interacting with teacher and peers. This does not mean that we no longer need the teacher, there is no way that formal learning becomes possible without the presence of teacher. What differentiates teacher-centered and student-centered instruction is the focus and attention. I believe in student-centered class, teacher pays adequate attention to individual student, and in order to achieve so, the focus transfers from what teacher teaches to what students need to learn. A systemic syllabus and lesson plan are better combined with practical learning objectives so that we are willing to learn what can truly benefit us. To realize so, individual idea should be shared among others, therefore, such class was ideally delivered with mutual communication and interaction between instructor and us, so he knew what we really did and what needed more practice and improvement.

As seen from P7’s statement, it was perceived that SL has the capacity of transferring the conventional and stereotypical teacher-centered, monologue teaching style into a teacher-initiated, interaction and communication. P1 stated,

Creativity and activeness toward learning were greatly diminished under the old learning style [teacher-centered], in which instructor was seen the only authority, and we just followed what’s told. Rarely had anybody questioned or challenged the instructor, even when he or she did make some obvious mistakes. It’s like a typical “spoon-fed” [rote learning] model that everyone was demanded to receive humongous information and knowledge without caring how much we could actually comprehend and utilize. As the consequence of such approach, education in China is well-known for its exam-

orientedness, and objectively scored tests have become the only measurement for our impractical performances.

Although, I cannot make a single assertion that teaching and learning in SL is a “cure-all” for our education, but at least it really is an eye-opening approach and definitely different from how I used to learn, particularly in the enhancement of interactivity among everyone who involved in the learning and teaching process. For this reason, I think I should give it a try.

Unlike traditional in-class interaction that is always synchronous between instructor and learners, and among learners, synchronous and asynchronous interactivity can co-exist in SL.

Although synchronous interaction comprised the majority of the SL course since all in-class sessions were held when both instructor and learners were present online together, asynchronous interaction continued in the format of offline communication between instructor and learners and among learners during intervals. This was due to a unique feature that SL offers: a continuous and seamless transition between online (synchronous) and offline (asynchronous) communications. A user’s text communications remained intact even when they signed off SL, and responders had the opportunity to view them at a later time. This was quite beneficial for learner participants, as the instructor pointed out in his course evaluation.

I got a considerable amount of questions and feedback from learners during class intervals. This was really to my surprise as compared to my in-class teaching, where rarely had my in-class students asked some questions about what they learned during class, it was sometimes bit difficult for me to evaluate if they had accomplished what they were supposed to achieve, even if they were given certain tasks. On the contrary, those SL learners demonstrated a great enthusiasm about their learning. They were eager to get any feedback about their performances from the in-class sessions, and they also consulted me a lot to get to know something they had never known before like job-hunting in civil aviation in the U.S., and those they felt relevant to their future career. I tried my best to reply them as much as possible by using SL’s internal text communication because we couldn’t get in touch with each other due to time difference. This was better than email and instant messaging, simply because they (learners) were kept and embraced within the same environment as they had during the in-class session, so they were not at an unfamiliar and outside place where they tend to be less active than in (SL) world.

From the learners' perspectives, some also recognized the combination of synchronous and asynchronous communications in SL. P12 stated,

Though I've never officially taken any online course for credit, I joined several open courses brought by world famous higher institutions such as MIT, Harvard, and Oxford, etc. At school, we also used Blackboard as an online learning tool. Unlike those online tools, SL can be used for both synchronous and asynchronous learning, provided that our teacher cannot be always with us all the time, let alone he resides in another hemisphere! So it raises the question: what should we do when class is not in session? I found that not only myself but many of my peers actively utilized the text communication with instructor during intervals. We even communicated with each other via SL. You can't imagine, I have never met some of them before in real life but here! Even I knew that we might come from the same university or school. SL provides us such a great opportunity to let us self-reflect about our own performances, meanwhile we can give others useful feedback. This saves precious in-class time for instructor since in-class session itself was relatively shorter and I'd like to learn more from the lectures and instructor. And intervals can be used as the extension and supplement to in-class sessions with the purpose of reviewing, reinforcing, and reflecting of learned knowledge.

P10, a sophomore in the Airliner Pilot program, used terms "continuity" and "entirety" to address the implication of the use of both synchronous and asynchronous communications in SL. He noted,

I used to less review and inquire something with my teachers and classmates after class, and this really affected my learning outcome. It's not because I was lazy but I had little chance to communicate with them. Everyone has their "off-class" schedule, and it's always difficult to make an appointment with teachers, especially, many of them commute between home and school, so they can't stay at school that late to meet everyone who requests an individual appointment. We tried to use email but it took longer time for them to respond, and since the email was not always an ideal medium to contain the relevant information or resources we were inquiring, teachers couldn't always respond accordingly, and they just simply replied that I needed to talk to them after class, in person. Then the next time when I wanted to talk with them, they were all gone, again! So I switched email to instant messaging communication. This seemed effective at first sight, but later I found out that, it had the similar issue as email, because instant messaging can be used without context, so it greatly impacted the continuity and connection of what I've learned in the class and what I wanted to inquire with teachers.

On the contrary, in SL, we became quite flexible of how we got in touch with the teacher and peers. The SL's internal communication was contextual, meaning our inquiry could be referred accordingly without isolating between subjects and content. Such asynchronous communication went beyond time and space constraints, but was still kept for its original and contextual meaningfulness. So the communications during intervals

became possible, directive, and eventually, effective. By doing so, the synchronous communication in the class was extended to asynchronous communication during intervals, the “continuity” and “entirety” of the communication were well sustained, so we could learn more.

Activity and task design for ESP learning. In addition to the interaction that occurred between the instructor and the learners, communicative and collaborative interactivity among individual learner participants was also realized by their active engagement and fulfillment of the activities and tasks in the VLE of SL. This was quite distinct from learner participants’ prior in-class learning where they spent most of the time “listening” to the lectures or “watching” the presentations without accomplishing tasks, which was the critical assessment for learning outcomes. P6 criticized traditional in-class English learning.

I don’t like the way we were taught before. As future flight attendant, we need to learn English more practically, not only for passing the CET 4 in order to get the diploma. More profoundly, we must use what we’ve learned. Unfortunately, I really did not learn much from the class. We did actually interact quite a lot with instructor, but it seemed bit mandatory and passive, you were reluctantly called to stand up and practice oral English with instructor, and most of the time, we just recited the sample conversations from the textbooks, and the content has not been updated for many years. With little or no comment on your performance, you really got limited feedback from instructor. That really discouraged your confidence and your effort to improve.

She also praised how SL helped her to learn more by engaging her in the interactive tasks and activities with both instructor and peers. She noted,

What I liked most about learning in SL, was that I could interact with both instructor and peers via avatar in the aviation-simulated scenarios to practice and enhance my oral proficiency of aviation English. It lessened much of my embarrassment and pressure as I always perceived from in-class learning. I did appreciate Mr. P [the instructor] who demonstrated, encouraged, corrected, and assessed my performance. And I also enjoyed learning from my assigned teammate who also gave me valuable feedback on our performances, as well as from all other learners. Though we used to have group activities such as discussion in class, not everyone had equal chance to express own idea, let alone learn from others. It seemed to me that SL enabled me to be more interactive than in class, due to the fact that, you were not presented in front of anyone else, and your confidence could be really engaged and enhanced, you dare to speak out loud. I like that feeling.

In the SL course, learner participants were given challenging tasks that could be accomplished, and the multimodality of task design immensely stimulated their interactions with both instructor and peers. The instructor highly praised learner participants' endeavor and consistency in completing all tasks. He indicated that

The tasks designed for this course not only satisfied as a parameter of what they [learner participants] learned in the SL, but also engaged their interactions with peers and me. Though it was true that not everyone could fully complete the tasks due to both personal and external factors, they demonstrated a commitment of interacting with others in order to gain considerable amount of experiences, feedback, and self-reflections that they never had a chance to get in the classroom. At least, they were confident to express their own ideas and share with others, this is always critical for language learners. One thing worth noting is that, the role-playing task immensely stimulated their collaborations that were based on their existing and learned experience and knowledge, to help solve, propose, and evaluate the given problems, solutions, and performances.

He also commented on the importance of task design for interaction in language learning.

On the contrary, my in-class students [non-English native speakers] heavily relied on my lectures, they had habitually cultivated themselves as passive learners without adequate practice and task fulfillment. I understood that they were more eager to pass the FAA written test than learning some useful aviation English that they would surely be using in real life scenarios, so in contrast to these SL learners, they minimized the significance of task and interaction, that would ultimately make them as "inexpertise" of integrating and utilizing necessary aviation knowledge and English simultaneously.

Several learner participants (P1, P4, P7, P15, and P16) indicated that task design involving team competition and game-like activity stimulated their interest and made them eager to complete the task. It also reinforced what they had learned from the lectures and presentations. As P7 noted,

I believe it is the human nature that everyone strives to outwit than others. If such mechanism was handled properly, it could be an ideal stimulant to inspire learners to be more creative, cooperative, and yet, productive. I like the fact that SL provides such mechanism that everyone learns from everyone else by competing and reflecting on own and others' performances.

P11 indicated that as part of the fulfillment of the pre-designed tasks, the peer-review and self-evaluation also contributed to learner participants' comprehension and reinforcement of the knowledge learned and skills acquired. She noted,

In previous in-class learning, we only got feedback from our instructor as the only source. And such feedback was always not prompt, either we had to wait till our assignments graded and returned, which could take as long as over a week after class, or by luck, if we had a rare opportunity to get some feedback from the instructor during the class. However, both situations could affect our reinforcement and better understanding of the problems or issue we made in the class. However, in SL course, we were encouraged to immediately offer peer-review and evaluate our own performances right after each session, and instructor offered assessment based on these reviews and evaluations, which doubled the credibility and reduced the redundancy that caused by the workload itself to instructor. I also see these two activities provide greater reflection and recommendation to improve both instructor's teaching and our own learning.

One thing worth noting is that the original idea of designing the tasks *Flashcard 1* and *2* was to enable learners to reinforce their in-SL experiences with their individual study during SL course. However, they actively developed it into an asynchronous communication, which was in the format of a Q&A session with the instructor. During interval between Session 2 and 3, they utilized SL's internal IM to initiate inquiries and attempted to help others by either answering or raising questions for their peers, as observed by the researcher. This extended the in-world synchronous communication until the beginning of Session 3.

Theme 2: SL was a “double-edged sword”

Although learner participants perceived the advantages and benefits of using SL for their English learning, several incidences still occurred during the in-world sessions. Moreover, learner participants also identified certain deficiencies or drawbacks to using SL for their ESP learning. All of these findings have contributed to the emergence of the second theme that responds to the research question.

Incidences occurred during SL course. Several incidences were identified from researcher's observation and learner participants' feedback. These included technical issues caused by individual participant's hardware and software as well as class schedule conflicts.

Hardware issues. Few learner participants (n=3) reported that they occasionally encountered technical difficulties such as temporary internet disconnection, graphics distortion and lag due to CPU redundancy, and computer crashes caused by inadequate internal memory. P5 was absent for Session 3 because she lost the internet connection with her computer when class was just in session, and she explained,

Although I had the opportunity of reviewing others' performances via recorded videos, it was still a pity for me not to be able to participate in the session that I missed. Unlike in-class learning, you were allowed to be bit late and you were still able to attend the class, in SL, if you couldn't figure out and fix the technical problems prior to the beginning of the class, it's highly possible that you would miss the entire session just like me. Since class is primarily synchronous, your absence would not affect others, therefore, no one is responsible for your absence, and no one should wait for you, or re-schedule, let alone the instructor.

Software issues. Certainly, the SLV is not a 100% crash- and bug-free software. Some learner participants (n=5) encountered software issues caused by malfunction, misuse, or misconfiguration of the SLV such as repeated software crash, unsaved text communication, muted voice communication, and inappropriate termination, interference, and teleport. P5 reported that she had trouble running SLV properly with her laptop.

I followed the instruction provided, and I was able to install the SLV in my computer. It did go well for the first session. And a week later, when I wanted to check and prepare for next session, I found out that I couldn't open up the SLV. So I asked Mr. Li [the researcher] for help, turned out it was because my laptop went through a routinely scheduled Windows update that was incompatible with the current version of SLV. So he gave me two options: either uninstall the Window update, or downgrade the current version of SLV to a lower version. Since I am not proficient with computer hardware and software, if I wanted to learn something in the SL, I really do hope there is nothing that can surprise me in this way! Otherwise, I would feel bit frustrated and uncomfortable.

Class schedule conflict due to personal reasons. Due to the nature of synchronous learning in distance education everyone including the instructor was present at the same time, so a prompt and effective interpersonal communication for everyone could be realized. Since the instructor resided in the U.S, there existed an obvious time difference that negatively affected the smooth and successful schedule and implementation of in-class instruction even though the researcher attempted to accommodate everyone to be able to participate in the scheduled session via QQ. Still some could not participate in the session on time. As P6 indicated,

I really did not want to miss any session because it was a great opportunity for me to learn from the instructor and other fellows from this SL course. And I tried my best to make sure that there was no conflict between class session and my own schedule. However, you can never prevent something unexpected from happening ahead of your perfect plan. The only way for me to catch up was through the viewing of the in-session videos, but still there was no way for me to participate in that particular session that I missed. It is the same as you will miss the class at school, but the difference is that, in this SL course, we had to better adjust to instructor's availability due to time difference. I knew the researcher did help us by negotiating with the instructor to accommodate to us. So the fact was, both party did sacrifice their respective personal time for this course.

Deficiencies and drawbacks of using SL for ESP learning. Several deficiencies and drawbacks were also identified. They were centrally related to SL's relatively secured and isolated environment and individual users' personal factors.

Lack of face-to-face interaction. Although SL mostly reduced the physical tension between instructor and learner and among learners (so learner participants could suffer less language anxiety often seen in face-to-face interpersonal communication), two learner participants (P5, P9) claimed that they felt the need of face-to-face interaction when SL only enabled voice chat among its users. As P5 noted,

I know SL was designed without the capacity for users' face-to-face interaction but avatars'. However, I sometimes felt isolated not because I wasn't paid enough attention from instructor or my fellow "classmates", rather, it was the feeling that you were talking to an avatar without a tangible contact. I'm OK with this for a short period of time, however, if such non-confrontational interaction persisted or became the only option for

me, I might feel uncomfortable. I don't know if others perceived the same, but to me, it might be the issue.

Insufficiency of individual attention. Although both the instructor and the researcher attempted to pay equal attention to each learner participant by interacting and communicating with them whenever possible, a few of them ($n=3$) complained that they felt a sense of insufficiency of individual attention. As P11 mentioned,

Don't treat me like a picky person, but I have to confess that I thought I could be paid more attention in the SL course than my in-class learning, because we used to have over 50 classmates in one classroom, and this was only 16 in SL! However, I do understand and feel sorry that I should not reveal my discontent to you [the researcher], since everyone was trying hard to offer us a novice and intriguing learning environment that's absolutely different than before. I also know that managing a class in a virtual world definitely took extra time and effort from instructor and you [the researcher], and instructor had limited time concentrating only on me, it was a selfish thought since this was not a one-on-one tutoring, I should not ask for more. But what I am saying here is that, I wonder if there is something that could change such situation, such as adding more instructors or teaching assistants within the same SL classroom, under the coordination and negotiation of the "chief instructor", each of them takes portion of the responsibility to help reduce the workload the chief instructor used to take. Of course, the primary lecturer should still be the chief instructor, but for other components of the course such as tasks, reviews, and interval Q&A, they can be assigned to other subordinate instructors or teaching assistants.

Inadequacy of self-discipline. The entertaining mechanism that is rooted in the SL somehow could make its user addicted to the virtual wonderland. Users spend a lot of time and energy visiting and engaging in non-essential or irrelevant locations and events, given the fact that the majority of the SL world is open to public residents. Therefore, self-discipline was seen as extremely important as the lack of self-discipline could lead learners to a less effective outcome. As P10 mentioned,

If I entered the SL without a clear motive or goal, and a strong determination, I am sure that I would be lost in this endless virtual world. I know there is uncountable resources in the SL, so if you can regulate yourself by limiting your avatar loiter in the SL, with a specific purpose, then you are good to go. However, if you just wanted to relax and kill some time in SL, it could waste you more time diving in the virtual world. Make sure you understand that you are the master of yourself, not your avatar. And more importantly,

the instructor has no responsibility of that you are doing in the SL, he is not your mummy or nanny, and you are an adult, you should be responsible for everything you do.

Disconnection between reality and virtuality. SL enables and encourages users to be fully immersed into its VLE, so everyone can enjoy a sense of existence in the virtual world via his or her avatar's interaction with others'. However, since not every learner was able to properly adjust and switch between one's real identity and virtual persona, learning in the virtual world of SL became less effective when the learners could not balance and control their participation and involvement between real life and virtual learning. P3 shared her opinion on this drawback SL might affect ESP learning.

Over the entire SL course, I did not find myself greatly addicted to the virtual world. However, I did perceive the possibility that those who cannot balance themselves between real world and virtual world, would be at risk of jeopardizing their normal life via the overly immersion in the virtual world. In other world, what you have done in the SL, should only be used as the reference for your future practice, it should never be imitated or copied exactly without considering the actual situation and scenario in real life. You can mess around in the virtual world, but you can never do the same in reality. For instance, you can bump into a pedestrian when driving in the virtual world, no matter it's your carelessness or real intention. But you cannot drive your car to crash over an innocent human being in reality. Many young and novice users of violent video games became sympathetic criminals just because they unconsciously transited their roles from the virtual world into the reality.

So in order to ensure and enhance our experience in the SL for educational purpose, I do feel the urge to firstly cultivate the capability of distinguishing and controlling yourself between virtual and real world. This is also seen crucial for students of aviation-related program, since we will be serving hundreds and thousands passengers on the daily basis, you can make a fatal mistake due to what you mistakenly learned from the virtual world, you need to have your own judgment and awareness.

P6 reported one instance of negative feedback about the use of role-playing as one of the SL tasks, he noted,

Role-playing was a good way of simulating and practicing aviation English, especially when we were unable to practice such task in the real-life scenario but a life-like simulation in SL. However, when doing role-playing in the SL, I also perceived a disassociation between me as the learner, and my avatar that represented me to do the

task. I was unconsciously intertwined between the real me and the avatar “me” that somehow might affect my actual performance.

In sum, the analysis of the data obtained from in-world observations, interviews, and documents indicated that learner participants gained an incomparable experience in the VLE of SL that was distinct from their previous in-class learning. They were able to learn in a purely English environment with ample authentic material and appropriate and achievable tasks, and were led by an English native speaker with aviation expertise. SL has met all these conditions that were difficult or impossible to satisfy in the traditional classroom. In addition, the analysis also pinpoints several incidences occurred during SL course, and deficiencies and drawbacks of using SL for ESP learning perceived by the learner participants.

Research Question 3

The third question asked, “What do learner participants consider to be the affordances of SL for ESP learning?” Data were collected and analyzed based on observations and interviews with all participants, and reviews of the generated documents. Several affordances were identified based on the analysis of data and in reference to what Henderson et al. (2012) identified as SL’s 7 affordances for language learning.

Affordance 1: Reduced Affective Filter via Avatar and VLE

Unlike a traditional English class, learning in SL involves less direct face-to-face communication between instructor and learners. Instead, they used avatars to be immersed in the VLE of SL in order to maintain high participation for both parties, which greatly reduced the foreign language anxiety often caused by the physical proximity between instructor and learners and among learners in the traditional classroom. P4 shared his experience.

I have noticeable accent when speaking English. I used to talk less when we were having conversational tasks in class. This task required me to team up with my desk mate to simulate intercommunication between pilot and ATC. I failed many times not only

because I wasn't fully prepared, but more embarrassingly, I was extremely afraid to "lose face" in front of my partner, my teacher, and the whole class. It's simply because I had accent! I know it's OK for me to have accent, provided that a lot of non-English native speakers have more or less accents, and I also thankfully understood that my teacher and classmates were patient and kind enough not to laugh at me in order to encourage me and preserve my self-esteem. But I just couldn't convince myself that accent is no big deal! This has been haunting me ever since we started taking the aviation communication class!

On the contrary, when I was learning in the SL, such situation has been dramatically alleviated. This was because no one ever recognized me from my avatar! By performing role-playing of avatars, I felt that I had enough "buffering zone" to interact with everyone in a much comfortable manner. Though I believe that my accent still exists, without the same feeling I used to have in class, I could be focusing more on the content of the communication, rather than if my accent is native-like or not. I felt I was more positive about what I've learned in the Second Life, and I am ready to face more challenges!

Some other participants used key words or descriptions such as "less painful" (P14), "no more fear" (P9), "less boring and increased my eagerness for learning" (P12), "less anxious about what to learn" (P7), "felt less marginalized among others" (P13), "confident to learn something new" (P1), and "interesting and maintained my interest in learning" (P16) to highlight and address this affordance. P11 also noted,

Learning in SL enabled me to be focusing more on the subject matter rather than how I should behave properly. In other word, in SL, I did not have to think twice what I need to pose and how I should express myself. Instead, I could concentrate more on the content and avoid distraction caused by my classmates. And I felt I was situated in a relatively less monitored and passive environment, which inspired me to speak and share more than what I used to do in the classroom.

Affordance 2: Co-presence of Content and Linguistic Knowledge for CBI

This was the fundamental affordance that SL offered for ESP learning as it provided the opportunity for content and linguistic knowledge to be presented, referred, and discussed simultaneously via the VLE in SL. The implementation of a CBI lesson plan determined the specific content and linguistic knowledge to be taught, as well as what specific learning environment would be used. For this study, of course, this was aviation English and knowledge

of aviation inter-communication. The VLE of SL was designed and modified by the researcher to provide learners with a series of instructional or simulative aviation-related facilities (e.g., virtual classroom and airport) and objects (e.g., airplane, cockpit, and ATC tower). The learner participants were allowed to immerse into these facilities and objects. Therefore, content (aviation communication) and linguistic (English for aviation communication) knowledge could be acquired and mastered simultaneously. P10 explained the reason why he considered SL to be a more applicable platform for learning ESP. He indicated,

In the physical classroom where I studied, it was not that easy for both instructor and students to pay equal or greater attention on both the aviation knowledge and English that carries them together, at the same time. We also felt a gap between what we learned and what we would use in reality. We heavily relied on the Chinese-based textbooks hence disconnected and isolated our comprehension of the knowledge and skills that are usually presented, delivered, or used in English, since it is the official language for civil aviation industry under the global scope.

Affordance 3: Learner Autonomy Enabled and Enhanced by Avatar Control

In addition to the fact that learner participants were encouraged to be actively involved in the learning process in the VLE of SL, learner autonomy was realized primarily by individual learner's use of the avatar. Learners had absolute control of their avatars were, therefore, able to seek, explore, inquire, and collaborate via the avatars without compromising their physical presences during the interaction with their instructor. As P7 noted,

Avatar in SL increased my perception of greater autonomy as a learner, as compared to my previous in-class learning. First, I was no longer restricted by my physical entity that used to be limited in the classroom. Rather I could walk even fly in the virtual world. This gave me a sense of "freedom", and I emotionally felt comfortable to learn something. Second, the avatar was seen independent to each other, so avatar as my representation in the virtual world was still autonomous, in other words, I had the control over my own avatar. Third, by manipulating my avatar, I could actively interact with instructor and classmates via their avatars. This greatly reduced my reluctance of communicating with others, which was often seen in my classroom. The virtual world and avatar enabled me to initiate more inquiries, comments, and feedback, as well engage teamwork and produce more self-reflection during my stay in the SL.

Affordance 4: Convenient and Immediate Transition from In-class Learning to Experiential Field-trip

In a traditional classroom, the gap between learned knowledge and acquired experience always decreases the effectiveness and efficiency of both learning and teaching. This is because (1) newly acquired knowledge and skills cannot be practiced, examined, and tested immediately; (2) it takes longer time and distance to reach the practicum site for learners to practice learned knowledge and skills in a real-life situation; and (3) such field trips to a practicum site are often unrealistic or inaccessible due to physical and time restriction, expense, and inadequate instructional support.

By comparison, SL can provide immediate and interactive experiential experience from virtual classroom to a virtual practicum site that does not require an actual field trip. By using SL's teleport function, learner participants' avatars were able to freely transfer between individual spots that were accessible to the public such as ATC towers, airliners, runways, and airport main lobbies. Learner participants were given relatively unlimited privileges to practice on these premises without time and physical restrictions. The opportunity for experiential learning, as provided by the VLE of SL, is one of the two constituents that ensures a constructivist approach in ESP learning (Tarnopolsky, 2012). Some learner participants praised the advantages and benefits of SL for such experiential learning. P3 noted,

We used to wait for quite a long time to be able to board on a simulated model of airplane cabin to do the role-playing practice as flight attendants. It was time consuming and cost extra expense if you wanted to do that way. Therefore, not everyone from my program was able to practice in that environment. Thanks to SL that offered us a real life simulation of airplane and inside of the cabin, together with a complete set of facilities often seen in the airport, and we were able to be directly connected with the instructor and resources. It's really time saving and economical.

P15 also mentioned, "In SL, we no longer have to travel to the airport to practice ATC communication, given the fact that our school is far from it." SL's teleport functionality saves

expenditures for expensive and unrealistic field trips and transfers students conveniently and promptly from in-class learning to in-field practice. This shortens their transformation from conceptual knowledge and abstract ideas into concrete experience and practical skills. As P14 noted,

SL shortens the time between learning and practice, the latter is always crucial as it somehow testifies what you've learned in the class. By using teleport, we were guided by the instructor to commute between the virtual classroom and airport, which also included the premises and objects such as ATC tower and cockpits. Therefore, we were able to practice in that particular situation. This was definitely different from my previous in-class learning. In SL, we practiced aviation English for inter-communication with the notion that I was just a functioning staff in the airport, and I was no longer a student sitting tight in the classroom! The result and effect of role-playing in SL was much better than in-class, because our perceptions of our roles were enhanced with the change of the scenarios or environment. In-class learning couldn't achieve this goal as SL did.

Affordance 5: Learning Retention Ensured and Engaged by Multiple Task Design

According to Lalley and Miller (2007, p. 67), the average learning retention rates gained from lectures, reading, and audio-visual aids are 5%, 10%, and 20%, respectively. However, activities such as demonstration, discussion group, and practice by doing could increase the retention up to 50%, 75%, and 90%, respectively. The capability of designing above-mentioned activities and tasks (see Table 9) in SL ensured learners to be able to maintain and enhance their retention gradually and progressively. As P5 noted,

I like the way SL makes learning enjoyable and effective. We used to be taught English for cramming English exams, and English was considered a standalone subject without incorporating or utilizing with other subjects. Even we did have a particular class for aviation English, we were only instructed strictly based on the textbook. There is no extra activity or assignment beside the ones in the textbook, together with tedious lectures and uncountable readings!

On the contrary, this SL course offered different tasks that were relevant to the learning objectives, and we were able to complete the tasks without major obstacles or difficulties, which was good as it would not discourage us. Though not everyone could finish all tasks including me, at least, the design of multiple tasks made me feel I was paid enough attention, based on such feeling, I was willing to continue my learning in the SL. It

greatly reduced my boredom for learning, as compared to my previous experience in the classroom.

P7 complimented how the design of multiple types of activities and tasks in SL course engaged him in the learning process and enhanced his performance and outcome. He indicated,

First, by completing different tasks, I wouldn't feel bored and tedious about the task itself, as compared to the single design. Because I was eager to face new challenge, my confidence and curiosity enhanced as I continued my journey in the SL course.

Second, I personally think that these multiple tasks were designed suitable for reinforcing my comprehension of the knowledge and mastery of the skills gained from both virtual classroom and field trip. Each single activity and task had a clearly defined goal that was in accordance to the learning objectives of each session. Therefore, I was well informed of what I'd expected from the fulfilment of these activities and tasks.

Third, design of multiple tasks did not mean the excessiveness in quantity, rather, it was a systematic and gradual process that enabled learners to experience and fulfill. You won't feel much of the inconsistency from Session 1 to 3, and the level of difficulty also raised gradually. Although every task was a challenge to me, at least, you would not feel unachievable at the beginning. You would gain more confidence when class went on. I like this type of task design.

Affordance 6: Practicability Due to Real-life Simulation

ESP education emphasizes the practical use of acquired English and SL to some extent satisfies such a demand. This is primarily attributed to the fact that life-like simulation in SL offers users rich and resourceful real-life experiences virtually, so that learners are able to apply what they have learned in the SL to real-life utilization. P9 described his perception of the practicability of learning aviation communication in SL.

The design of the cockpit was life-like so that I was able to be situated in that particular location to role play as a pilot. This was more obvious if you used first person perspective with your avatar: you could feel that you were the real pilot communicating with ATC tower. It is pretty much the same experience as what a student pilot has in the cockpit simulator but without expensive equipment. Being immersed in such simulation, I was able to "act" the role as the pilot that I will be pursuing as my future profession. The communication between me and instructor and with peers were actually applicable to real situation. I am confident that I will be able to continue such role in the cockpit simulator, and I also believe I will do as good or even better in the real cockpit in the future. The experience that I gained in the SL was valuable, referable, and extendable.

P11 also commented,

I think SL connects what we've learned from the textbook with what we will be encountering in future work. It served suitable as a "buffering zone" that helped us to become more familiar with the real-life scenario without directly and immediately expose us into an unfamiliar situation, so we were still able to progress until we were confident enough and gained essential knowledge and skills prior embarking on the real airplane or ATC tower. SL has made the in-class learning more practical by extending the knowledge and rigid theory into a vivid, multimedia-oriented scenario or situation that were designed in accordance to the reality.

Therefore, SL is not seen as an isolated virtual learning environment, but rather one that extends learners' experiences from virtuality to reality with the goal of making learning more practical.

Affordance 7: Learning Flexibility

Quite distinctive from those purely synchronous or asynchronous learning platforms or tools such as video conferencing, instant messaging, and discussion boards, SL enables interchangeability between synchronous and asynchronous modes that makes learning more flexible and more easily managed. Although according to the feedback of the majority of learner participants that synchronous learning was their preferred approach, asynchronous learning was also perceived essential to extend "in-world" learning to learners' "off-world" learning.

The asynchronous learning in SL can be classified into two types. One is the asynchronous communication between instructor and learners and among learners (see Finding 3 of Research 2), and the other is the use of AV recordings and generated materials of previous synchronous in-class activities. Both could help learners to enhance and extend their in-world experiences when they log off from the SL. P7 talked about the use of the portfolio that was generated from Task 3 of Session 3.

I liked the continuity of learning from within SL to my normal study. I kept the portfolio we collaboratively compiled from the class with all IM correspondences and feedback I got from the instructor during the intervals. This is valuable for me to review what I've done well and what I still need to improve. This is first-hand resource that should be reviewed repeatedly.

P13 noted his experience with the in-world recordings. He said,

These recordings of previous sessions helped me reflect my own performance and I could also refer to other learners to see what they have done well and what needs improvement. It's pretty much like reflective learning. And these clips are totally different from what you usually can find online because they contain more direct reference from your classmates, as well as yourself, which provides a first-hand reflection.

P6 added,

I could convert the recorded sessions as compatible video file and upload them into my iPhone and iPad, so I could review them as many times as needed. Learning becomes consistent and on-the-go. I foresee such trend that could sustain and extend (SL) in-world learning.

The instructor also suggested that recordings of SL in-world teaching-learning activity could be used for those who have no access to SL but are eager to experience such virtual learning. This could help promote SL learning for ESP education.

Affordance 8: Authenticity of Both Instruction and Resources Offered at a Distance Manner

Similar to other types of online and distance education, SL places both instructor and learners into the same (virtual) platform that has authentic resources. This surpasses the physical boundary of a traditional classroom in a non-native English speaking country or region. Such boundary is often the primary cause of inaccessibility to authentic resources and instruction for English learners. Therefore, distance education at some point has become the only solution and option because it is relatively more convenient and economic to integrate the authentic resources and instructor within the same platform. As P12 noted,

I think what we lack in the traditional classroom is the access to authentic resources, as well as qualified instructors who should be both proficient in English and expertise in aviation industry. We can find someone who is an expert in the field, but often he or she can't teach essential knowledge via English because he or she is not native English speaker or at least can't use English at a proficient level. And nowadays, almost 95% of the global information and resources are originated based on and presented in English, and we are demanded to use English for future work. Therefore, teaching and learning via SL somehow could solve this problem by integrating all accessible resources onto the

same platform, at the same time. With direct access to authentic resources, we were able to learn and interact with a native-English speaking teacher from a distance, which overcame the physical and time constraints of in-class learning. I think traditional in-class learning must change, sooner or later, in the future.

Summary

In this chapter, the researcher presented the findings that were identified to address each of the research questions. It was noted that learner participants held positive attitudes and practical motivation toward learning English for their specific purpose other than simply linguistic acquisition or preparation for standardized English exams. Rather, their professional need became the unanimous drive for learning aviation-related English and content knowledge in the VLE of SL. In contrast to learner participants' previous in-class learning, their performances in the SL posed a relatively higher level of learner autonomy because they were given authentic resources. Additionally, they went through a CBI lesson plan instructed by a qualified native English-speaking instructor who had systematic expertise and prior experience in training aviation-related personnel and reinforced their learning by completing a series of pre-designed tasks. Several affordances were then identified that demonstrate SL to be instructionally applicable for ESP education in a virtual and distance setting.

CHAPTER V: DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Based on the findings in previous chapter, this final chapter discusses and concludes those major findings to address each research question. Several recommendations are provided for ESP learners, instructors, and instructional designers, as well as for future study in the field.

Discussions

Research Question 1

The first research question (RQ) asked, “What are learner participants’ attitudes toward and motivations for learning ESP in SL?” According to the findings of RQ1, factors that led to the establishment of learner participants’ positive attitudes and motivations toward learning in SL could be classified as internal and external.

Internal factors included learners’ familiarity with SL’s mechanism and operation and perception of the relevance between SL and learning objectives as one of the pedagogical factors (Mayrath et al., 2010) as well as their interest in trying an emerging technology such as SL. Additionally and most important was their specific purpose for learning English in SL. For novice SL learners, in order to ensure and enhance their positive attitudes and establish practical motivations toward learning, the implementation of an orientation session was seen as extremely important prior to formal learning in SL as it helped learner participants become more familiar with how SL works and how SL could help them. This finding agrees with what Keskitalo, Pyykkö, and Ruokamo (2011) identified in their study that prior experience such as an SL

orientation could maintain learners' efficacy and support their continuity and involvement in the formal learning in SL.

According to learner participants' self-evaluations, those who majored in Airliner Pilot and Air Traffic Management expressed greater interests and more positive attitudes than participants of the other two majors (Civil Aviation Management and Flight Attendant) simply because this SL course was more tailored to their professional needs. However, since the civil aviation industry relies more on interdisciplinary collaborations and because aviation inter-communication is being used on a daily basis by many civil aviation personnel (no matter if one is flight crew or ground staff), it is practically essential for everyone who works in civil aviation industry to at least master the necessary knowledge and skills in order to perform effectively when demanded. This consideration (English for professional purpose) motivated all learner participants to take this SL course.

External factors included instructors and instructional designers' collaborative preparation for instructional objectives, technical support (for both instructor and learners), and instructor's own support, which also consisted of his or her positive attitude toward teaching in SL (see Dickey, 2011; Dutton, 2009; Jamison, 2008, Khan, 2011, McVey, 2008), and one's technical readiness for teaching in SL (see Ellis & Anderson, 2011; Jennings, 2010; Silva, Correia, & Pardo-Ballester, 2010). In addition, over half of the learner participants ($n=10$) attributed the authenticity of learning materials and instruction to be one of the major factors leading to their positive attitude toward learning ESP in SL.

Research Question 2

The second research question asked, “In comparison to in-class learning, what are learner participants’ experiences of learning ESP in SL?” Although all learner participants expressed more or less positive experiences of learning ESP in SL as compared to traditional in-class mode, several negative factors and downsides of using SL for ESP learning were still identified. They include aspects of class management, task design, actual implantation of the CBI, variations in communication patterns, and, inevitably, some technical issues.

Class management. Many learner participants and the instructor believed that SL was more suitable for a small-scale class rather than for larger audiences, which was in accordance with what Bignell and Parson (2010) observed from their study. Class management and learner retention became more challenging if there were too many students in one classroom at a time. Such situation was perceived by both learners and instructor. Some participants (P7, P9, and P13) recommended that enrollment in an SL course should be limited to a smaller size as compared to the typical class size in most of China’s colleges and universities (which is around 40 to 50 students per class) so that they would be able to enjoy quality instruction and communicate with instructor more often. (Note: an individual program is divided into several classes of students with each “class” of students assigned to a fixed classroom throughout their entire undergraduate study. They have opportunities to take elective courses when entering senior years, which are often taught in individual amphitheaters). Other participants (P4, P10, and P11) suggested that the length of each in-class session and the entire duration of an SL course should be reconsidered based on learners’ prior experiences with SL learning, existing knowledge and skills for the learning objectives, and the adequacy and appropriateness of intervals between each class session.

Moreover, the instructor reflected that during SL course, he sometimes could not figure out who was currently learning and who showed an “inactive” status because instructor and learners were not physically present and class monitoring somehow became ineffective or invalid, and class management by single instructor tended to be more time-consuming and distractive. Fekete (2012) has attributed this phenomenon to the “anonymity of using avatars [...] there is less trust extended to participants in an interaction where words could otherwise be tested against identity, facial expression, body-language, etc.” (p. 12).

Communication patterns. Although in the SL course, multiple ways of communication were enabled to all users, not all methods were fully utilized from the very beginning to the end of the course. It was observed that, at the initial stage (from the Orientation to the end of Session 1), learner participants’ preferred communication method was primarily text-based as learner participants were situated in a relatively unfamiliar yet isolated environment, as compared to their previous physical classrooms. Thus, they tended to feel insecure and embarrassed to use voice chat with others, especially, given the fact that, the only one who spoke was the instructor, and he only spoke in English. As the SL course continued, communication became primarily voice-based or mixed (voice and text) because learner participants had already established the connection between SL and learning objectives and dramatically reduced confrontation and tension via avatars. Therefore, they started seeking more available communication methods in order to secure and increase their learning engagement. This transformation coincides with what Dixson (2010) has suggested that he found that an online course has “multiple communication channels may be related to higher engagement and that student-student and instructor-student communication are clearly strongly correlated with higher student engagement with the course” (p. 1).

In addition, the absence of face-to-face interaction was a potential drawback in SL’s virtual communication. The reliance on purely virtual interaction via avatars could negatively impact both learners and instructor by decreasing their perceptions of the significance of face-to-face interaction in real life, which they have long been accustomed to, and would not be able to transition immediately and smoothly between these two types of interactions. This disadvantage agrees with Blackmon’s (2013) study where she found out that online faculty were more concerned about the lack of physical co-presence between them and their students to be a possible negative factor.

Task design. To engage and increase instructional effectiveness, an SL course should design “language learning activities that are motivating, providing learners with opportunities to engage in meaningful conversations and use the target language” (da Silva, 2012). Role-playing was considered to be one of the most engaging yet practical tasks for language learning, as understood by both instructor and learner participants. However, some problems may occur due to time constraints and the instructor’s limited attention to individual learner. For example, when performing individual learner-instructor and paired role-playing activities, the non-participatory individual learners (or groups) were potentially formed into two distinct types: those who remained “idle” and those who kept learning via their observations over other participants’ performances. And quite often, both instructor and researcher were unable to precisely identify and categorize these “unattended” participants into these two types simply because the learners’ avatars did not clearly indicate whether they were engaged in a learning process or were simply inactive, unless a text or voice contact was directly applied to them to verify their reactions. However, by doing so, it might have been possible to interfere or interrupt those who were actually learning. Therefore, such “probe” should not be practiced frequently during in-world

instruction. Moreover, learner's perception of the disassociation of virtuality and reality caused by the massive use of avatar and role-playing might affect their actual performances in reality, because their virtual selves were not equally perceived or could not be represented as the real selves in reality. Such perception of disassociation is in light of what Evans (2012) indicated that the "awareness of virtual Self is in some ways a result of distantiation between Self in physical world and virtual environment through the presence of virtual Self in a location separate from physical Self, and mediated by the avatar" (p. 524).

Therefore, in order to reduce or alleviate these negative phenomena, Mayrath et al. (2007) provided several useful tips on how to properly and effectively design role-playing tasks for language learning:

- a. Have clearly stated learning objectives for the activity that relate to overall course objectives;
- b. Have interesting and debatable topics that are anchored in context of class for each session;
- c. Provide very clear directions detailing group members, moderators, topics, etc.'
- d. Train students on how to customize their avatars, chat, and teleport;
- e. Create small groups (3-5);
- f. Rotate students through various and unique places;
- g. Give community feel to places (office, rug, campfire, etc.);
- h. Make it easy for students to teleport from place to place;
- i. Have "sit here" icons in each place for avatars to sit facing each other;
- j. Have moderators in each group that lead organized and structured discussions;
- k. Moderator should structure session so that only one person chats at a time which alleviates;
- l. Clutter or noise and allows each person to create thoughtful expressions;

- m. Moderator should give each role player a chance to introduce self before the discussion;
- n. Moderator should copy the Chat History from the session into Word for later analysis;
- o. Time allotted for each group in each session should be approximately 20-30 minutes;
- p. Gives time for each role player to introduce self and get situated;
- q. Gives time for meaningful discussions; and
- r. Take snapshots in-world of students during the activity. (p. 4224)

In addition to reconsidering a single task design such as role-playing, the instructor also suggested that the orientation in SL should include similar design of tasks as for the subsequent sessions, so learners are able to smoothly transition from orientation to formal learning. This might reduce the steep learning curve, as Chen (2014) pointed out, “tasks that capitalize on SL features, students’ cultural repertoire and world knowledge as well as simulate real-life tasks will make a difference in their [learners] virtual learning experiences” (p. 51).

Implementation of the CBI. According to Stoller (1997), one of CBI’s most important benefits is its capacity to enhance the natural teaching of the four basic language skills (reading, writing, speaking, and listening) in an integral and pragmatic way. The design of the aviation-themed CBI lesson plan covers the training of all four basic skills in a natural and logical manner (see Appendix C). Although an individual in-class session was designed for about 50 minutes, the actual completion time was in fact about 90 minutes. This included the delivery time for lecture and presentations, flexible “response time” for learners’ knowledge digestion, preparation for completing tasks, and actual time for completing these tasks, as well as instructor’s feedback. Therefore, in order to engage higher retention for implementing CBI in SL, the instructor

suggested that a trial class with fewer learners could be initiated before the actual course begins.

This is in light of what Wang et al. (2012) suggest, namely “testing the waters” (para. 15).

Technical issues. As expected by the researcher, the implementation and delivery of the SL course encountered several periods of downtime due to technical issues that were caused by both hardware and software. Given the fact that the researcher served as the technical support for instructor on site, it seems imperative that learners should be able to trouble-shoot commonly seen technical issues themselves when they are learning in SL because remote technical assistance from an instructor seems quite unrealistic, which could also distract instructor from concentrating on his or her instruction.

Moreover, what is worth mentioning is that, as Kelton (2008) pointed out, SL cannot allow individual learners to collaborate on the same text or multimedia document such as MS Word and PowerPoint. This is especially crucial for English learner when they need to be trained for language skills such as composition and public speaking. Although prior to the beginning of the SL course, an alternative trial incorporating Google Docs with SL was implemented, the actual collaboration turned out to be partly executed beyond the VLE of SL, by a generated URL link that could lead users to the external platform. This method was seen unstable and disruptive to in-world learning as it was periodically interrupted or terminated due to internet disconnection and repeated transition between SLV and Google Docs.

Research Question 3

The third research question asked, “What do learner participants consider to be the affordances of SL for ESP learning?” Based on the affordances SL offers for ESP learning that have been identified in previous chapter, the researcher discusses several issues that are centrally related to the actual application and implementation of SL for ESP learning.

Body language for language learning in SL. Henderson et al. (2012) indicated that an avatar's body language is one of SL's affordances for language learning, because it "can aid comprehension as well as provide opportunities to explore mannerisms and gestures intimately linked with the target language and cultural practices" (p. 403). However, in this study, body language and facial expressions were not necessarily utilized as they had little effect on aviation communication. This was because that aviation inter-intercommunication needed less physical (e.g., body language) but more verbal communication. Under such circumstances, interpersonal communication tended to be less face-to-face.

Moreover, there are in fact two major factors that greatly hinder the use of body language in SL. One involves technical constraints. Current hardware and programming in SL cannot vividly generate rich facial expressions and physical gestures for individual avatars, although users can customize their avatars' outfits and facial appearances as well as gender and race (as judged by avatar's complexion). The other factor is the difference between specific subjects. These natural sciences involve less direct interaction with humans as subjects, and therefore, the instruction and interaction do not necessarily involve the use of facial expressions and body language. However, social sciences such as psychology, mass communication, and art education do essentially require a higher demand for an avatar's engagement and exchange of individual motions, and SL at this point does not always provide a rich simulation and interaction due to its technological limitations.

Learning objectives and course design. Based on actual teaching and observation, the instructor and researcher have agreed that, as novice learners in SL, they should pursue learning objectives that are consistent with or suitable for their existing knowledge, experiences, and skills to avoid or minimize the possible steep learning curve, as well as situations described in

Krashen's (1985) "i+1" Input Hypothesis. Therefore, as Mayrath et al. (2010) suggested, a pre-study orientation that could help learners become more familiar with VLE of SL, and establish an understanding of how exactly SL benefits them is essential. This is important for novice SL learners at the very beginning of the SL course, as they hold the responsibility for maintaining their efficacy while being engaged in the SL learning process. In order to achieve this, the design of activity should include "(a) aligning Second Life activities and experiences to course instructional objectives and context, (b) capitalizing on existing student skills in Second Life, and (c) communicating clearly to the students the instructional rationale (learning objectives) for the activity" (Mayrath et al., 2007, p. 4222).

Future adoption of SL for ESP education. Although all learner participants expressed willingness to learn English for their specific purposes in SL and they also hoped that their school or program could offer such an opportunity, both the researcher and many learner participants agreed that SL courses should be offered in addition to their existing curricula. This is because, first, SL learning is mostly suitable for non-degree seeking learners. This does not necessarily mean SL learning is not a type of formal learning, but rather, it is because the approval for SL credits or programs is relatively complicated and requires accreditation and collaboration from both administrative and academic support. The establishment and implementation of one SL course demand that the school or program to be able to satisfy multiple criteria such as stable enrollment, effective class management, qualified instructors, and accompanying technical support, as well as the availability of compatible hardware and software, high speed internet, and adequate training for using SL. The planning and implementation of any online degree program requires considerable negotiation among relevant stakeholders (A. D. Benson, 2001), which is indeed beyond individual program, department, or college's capability

and authority. Also, institutional support and understanding at this phase, plays an extremely crucial role, and the lack of such support and understanding would also lead to instructors' reluctance and unwillingness to teach in SL (Blackmon, 2013; Mark, 2014).

Moreover, as indicated before, from instructor's perspective, one's readiness for teaching in SL can either positively or negatively affect his or her willingness and determination to use SL for teaching. Although the instructor had experience of teaching hybrid (combination of in-class instruction and online discussion board) courses before and received a complete and systematic training to familiarize with SL prior to the formal instruction in SL, he claimed the biggest disadvantage for him to use SL for future teaching was the inability of designing and implementing such SL course by himself, not only because it required in-depth knowledge of instructional design, but also more skillful experience to utilize SL for teaching, which seemed quite time consuming. This notion has also been identified by Hislope (2008), Peterson (2011), and Warburton (2009).

Therefore, although the researcher has identified several affordances of SL for ESP learning and both learners and instructor perceived the educational and instructional advantages SL offers for ESP education, the researcher suggests that learning ESP in SL at the present stage is still not an alternative but is, rather, supplemental to traditional in-class learning.

Conclusions

The study inquired and discovered that learners' positive motivations and attitudes toward learning ESP in the VLE of SL was attributed to the fact that SL was seen relatively more viable and engaging for learning content knowledge and specific English simultaneously, and SL had the capacity of offering both authentic learning resources and instruction, which distinguished it with both traditional in-class learning and all other forms of online/distance

education. The study also revealed that the biggest challenge to using SL for teaching and learning ESP was the inevitably occurred technical issues, which was consistent with the findings of the majority of empirical studies about SL and ESL/EFL education. And such drawback could cause learning inconsistency that negatively affected learners' in-world experiences and decrease both learning effectiveness and teaching efficiency. Therefore, as instructional designers, course instructors, and program administrators, we should be aware of and well-prepared in advance to better troubleshoot and collaborate on minimizing or eliminating these possible technical issues, in order to better maintain learners' positive attitude toward learning, and engage them attentively in such authentic learning environment.

The findings of the study also suggest that pedagogically sound SL course design is quite important for effective student learning in SL. For instance, the necessity of SL orientation and appropriateness of the task design and lesson plan based on the designated learning objectives. With the careful consideration of these factors, it was observed by the researcher and perceived by both instructor and learner participants that learning and teaching ESP in the VLE of SL was realistically accessible and reliable, yet the learning outcomes were achieved as expected that the majority of the learner participants had met their goals set prior to the formal learning in SL.

Conclusively, the findings of this study demonstrate that SL has the potential for delivering ESP-oriented course with content-based instruction (CBI). Ngan (2011) summarizes four factors that CBI can benefit and contribute to ESP learning: "authentic materials" (p. 92), "students' motivation" (p. 92), "active teacher's pedagogy" (p. 92), and "evaluation" (p. 92). By realizing and integrating all four factors in the experiential learning environment of SL, SL has successfully incorporated the two constituents of ESP instruction (CBI and experiential learning environment) in a constructivist learning approach (Tarnopolsky, 2012). Therefore, it is safe to

conclude that SL is an applicable yet effective venue for learning English for specific purposes. With foreseeable advancement in distance education and technological development of computing devices, the broader applicability of SL for ESP education is seen promising, and the greater potentials and advantages SL privileges for ESP education are yet to be future explored and studied. It is to the researcher's belief and vision that SL could be utilized for life-long English learning for some more specific purposes demanded by individual learners, due to its affordance for authentic learning, advantage for distance learning, and future potential for mobile learning that were identified and discussed from the study.

Recommendations for Practice

Several recommendations of how SL can be utilized for ESP education are identified and proposed here by the researcher. They primarily focus on three aspects that involve ESP learners, instructors, and instructional designers.

Recommendations for ESP Learners

First, ESP learners should actively seek resources that are freely available in the SL academic community. Many of them are suitable for ESP learning as they are predominately designed and demonstrated in English, with rich simulation of certain content knowledge and experiences. Second, learners should also hold a positive attitude by clearly defining their own learning objectives and goals prior to formal learning in SL. Third, learners should be actively involved in various ways of communication with both instructor and peer learners. Fourth, learners should utilize multiple approaches of inquiry such as discussion, critical thinking, brain-storming, self-reflection, and problem-solving.

Recommendations for ESP Instructors

ESP instructors should first keep in mind “that technology enhances teaching and does not replace teachers” (Wright, 1999, p.70). It is impossible that educational technology like SL could be utilized without an instructor’s guidance. Second, instructors should consistently maintain learners’ positive attitudes and engage their learning motivations by establishing the connection between learning objectives and the instructional advantages that SL offers (Mayrath et al., 2010). Third, instructors should consider teaching in SL as a supplement to their existing in-class instruction, since ESP learners are mostly degree-seeking students who are enrolled in specific programs, and currently, there is limited regulation and policy on accrediting SL course for credits and degree purposes. Fourth, instructors should be both computer and SL proficient in order to successfully run the in-world session: such proficiency always affects one’s willingness to teach in SL. Last but not least, instructors should strive to work collaboratively with instructional designers, school and educational administrators and policy makers, and technical support staffs, to design quality SL courses, promote and advocate SL learning and establish accreditations for SL courses and programs, and troubleshoot potential technical issues encountered in SL. It is suggested by O’Connor and Sakshaug (2009) that evaluation of SL’s applicability and practicability “should be an ongoing process—from determining how well the needs of your content area are served in SL to considering what advantages and disadvantages distance students have by being able to interact virtually” (p. 269).

Recommendations for ESP Instructional Designers

Instructional designers who would like to design and create SL courses for ESP instructors and learners should first familiarize themselves with the SL mechanism and basic functionality. Second, they should utilize and integrate existing and available SL resources and

maximize the application of Linden Scripting Language and other applicable third party software and hardware. Third, they should connect in-class and in-world learning by following what Wang, Burton, and Falls (2012) proposed the three-step design model for designing initial activities and tasks in SL, which aims to reduce novice learners' steep learning curve. It seeks to increase confidence in learning by assigning learners simpler tasks, helping them seriously participate in the learning process and consistently maintaining adequate feedback from instructor. In addition, instructional designers should seek possible ways of incorporating SL with other mainstream 3D virtual worlds (VWs) such as *Active Worlds*, *Twinity*, “*Blue Mars*, *Open Sim*, *OS Grid*, and *Utherverse*” (Mark, 2014, p. 225) to see if the integration could reduce or minimize SL's deficiencies for ESP education.

Recommendations for Future Research

Recommendations for further research are as follows:

1. In order to better evaluate and validate the findings of this study, future research should focus on replicating the study from a larger sample of non-native English speakers from China, other Asian countries, or other non-English speaking regions;
2. A longitudinal study could be performed to compare SL with other distance or technology-oriented ESP education, to see if SL enhances effectiveness and efficiency during the teaching and learning process;
3. Future research should focus on how to utilize SL to teach English with other disciplines or subjects, especially those in the category of social sciences;

4. This study involved limited research and reflection on instructional design, therefore, future research on instructional design for ESP-oriented SL learning environment is needed;
5. With the rapid development of personal wearable virtual reality (VR) devices such as Oculus Rift (see Linden Lab, 2014) that are being greatly used for educational purposes, future research should focus on the integration of SL as software platform and those VR devices as hardware, to see if they can be utilized together to enhance user's VR experience for ESP learning; and
6. Future research should focus on integration of SL with other major VWs to see if they could benefit ESP education.

Summary

This study offered a qualitative lens to examine the applicability and practicability of utilizing SL for ESP distance education. Novice learner participants' self-efficacy was maintained and enhanced throughout SL orientation and actual in-world learning. They achieved their respective goals set at the beginning via active engagement in various interactions and fulfilment of multiple tasks. Their comprehension of aviation communication knowledge, as well as the aviation English that conveyed these knowledge and skills, was simultaneously acquired and maintained via the implementation of a pre-designed aviation-themed CBI lesson plan. Several affordances were identified that could support SL to be utilized for ESP learning and teaching, which include reduced affective filter via avatar and VLE, co-presence of content and linguistic knowledge for CBI, learner autonomy enabled and enhanced by avatar control, convenient and prompt transition from in-class learning to experiential "field-trip," learning retention and continuity ensured and engaged by multiple task design, practicability due to real-

life simulation, learning flexibility, and authenticity of both instruction and resources offered at a distance manner. Recommendations for practice and future study on SL for ESP education were provided at the end of this chapter.

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APPENDIX A

RESPONSE FROM SECOND LIFE ONLINE SUPPORT TO RESEARCHER'S INQUIRY ON CONDUCTING RESEARCH IN SECOND LIFE

Details for Case #: [REDACTED]

Case Summary

Date Created Nov. 22, 2013, 2:39 p.m.
Case Type Other Inworld Issues
Case Status Closed

* What Operating System are you using?

- Windows XP
- Windows Vista
- Windows 7
- Mac OSX Leopard
- Mac OSX Snow Leopard
- Mac OSX Lion
- Other

* Please describe the issue.



Related Ticket Number

Comments

Nov. 24, 2013, 10:18 a.m.

Hello, [REDACTED].

Thank you for contacting Second Life Support about your research project. You can do your research in world as long as you get the permission from the residents that want to participate. Here are the links that you may want to look at.

http://wiki.secondlife.com/wiki/Academic/Research_Questions

<http://wiki.secondlife.com/wiki/SLED>

<http://community.secondlife.com/t5/English-Knowledge-Base/Terms-of-Service-and-Community-Standards/ta-p/851573>

If you have any more questions on this, Please, respond to this email with your answers.

If you have any other questions you may call or submit a new ticket.

Regards, [REDACTED]

Linden Lab Support

Add a comment to this request

APPENDIX B
SYSTEM REQUIREMENTS

(Linden Lab, 2015f)

Windows	Minimum Requirements	Recommended
Internet Connection*:	Cable or DSL	Cable or DSL
Operating System***:	Vista, Windows 7 or Windows 8	Vista, Windows 7 or Windows 8.1
Computer Processor:	CPU with SSE2 support, including Intel Pentium 4, Pentium M, Core or Atom, AMD Athlon 64 or later.	2-GHz (Vista) 32-bit (x86) or better
Computer Memory:	1 GB or more	3 GB or more
Screen Resolution:	1024x768 pixels	1024x768 pixels or higher
Graphics Card for Vista Windows 7 or Windows 8 (requires latest drivers)**:	NVIDIA GeForce 6600 or better OR ATI Radeon 9500 or better OR Intel 945 chipset	NVIDIA Graphics cards 9000 Series: 9600, 9800 200 Series: 275 GTX, 295 GTX ATI Graphics Cards 4000 Series: 4850, 4870, 4890 5000 Series: 5850, 5870, 5970

Mac OS X	Minimum Requirements	Recommended
Internet Connection*:	Cable or DSL	Cable or DSL
Operating System:	Mac OS X 10.7 or better	the latest release of 10.9
Computer Processor:	1.5 GHz Intel based Mac	2 GHz Intel Core 2 Duo or above
Computer Memory:	1 GB or more	3 GB or more

Mac OS X	Minimum Requirements	Recommended
Screen Resolution:	1024x768 pixels	1024x768 pixels or higher
Graphics Card**:	ATI Radeon 9200 and above OR NVIDIA GeForce 2, GeForce 4	ATI: 4850, 4870 OR NVIDIA: 9800

Linux	Minimum Requirements	Recommended
Internet Connection*:	Cable or DSL	Cable or DSL
Operating System:	A reasonably modern 32-bit Linux environment is required. If you are running a 64-bit Linux distribution then you will need its 32-bit compatibility environment installed.	A reasonably modern 32-bit Linux environment is required. If you are running a 64-bit Linux distribution then you will need its 32-bit compatibility environment installed.
Computer Processor:	800 MHz Pentium III or Athlon, or better	1.5 GHz or better
Computer Memory:	512MB or more	1 GB or more
Screen Resolution:	1024x768 pixels	1024x768 pixels or higher
Graphics Card:	<ul style="list-style-type: none"> • NVIDIA GeForce 6600, or better • OR ATI Radeon 8500, 9250, or better 	<ul style="list-style-type: none"> • ATI: 4850, 4870 • OR NVIDIA: 9600, 9800

Important Notes

* Second Life is not compatible with dial-up internet, satellite internet, and some wireless internet services.

** Second Life may not run on graphics cards other than the ones listed above. The following cards are NOT compatible with Second Life:

- NVIDIA cards that report as a RIVA TNT or TNT2
- ATI cards that report as RAGE, RAGE PRO, or RADEON 320M, 340M, 345M, or similar model numbers
- Intel chipsets less than a 945 including Intel Extreme
- Cards with the following branding: 3DFX, RIVA, TNT, SiS, S3, S3TC, Savage, Twister, Rage, Kyro, MILLENNIA, MATROX

The following cards have not been tested with Second Life, and compatibility is not certain:

- NVIDIA cards that report as Quadro
- ATI cards that report as RADEON IGP or RADEON XPRESS
- ATI cards that report as FireGL
- ATI cards that report as FireMV

*** Installation may require that the latest Microsoft Service Packs for your system be installed.

(Source: <http://secondlife.com/support/system-requirements>)

APPENDIX C

CBI LESSON PLAN

Module 2: Intercommunication between Pilots and Air Traffic Control (ATC)

Class Information

Class type: English for Aviation Purposes

Class size: 16

Class sessions: 3

Class location: Invitation-only (via teleport) virtual classroom in Second Life, simulative internals of several ATC towers and airplane cockpits in Second Life.

Learners' educational background: university undergraduates (sophomore and above), aviation-related majors

Session 1

Topic: *Intro to Module 2 & the Significance of Aviation Communication in Civil Aviation Industry*

Session duration: 50 min

Materials (Artifacts) used:

1. Adapted YouTube video presentation
2. PPT presentation
3. ICAO documents on aviation communication failures (excerpts)

Language Learning Objectives:

After completion of this session, learners are able to:

1. Explain the common causes of aviation communication failures
2. Explain the possible solutions to aviation communication failures
3. Draft “compare and contrast” style of English essay on given topic

Content Knowledge Objectives:

After completion of this session, learners are able to:

1. Identify the purpose and learning objectives of Module 2
2. Recall the history and development of civil aviation communication
3. Raise awareness of the significance of aviation communication in civil aviation industry
4. Analyze and explain the common causes of aviation communication failures and provide their respective countermeasures

Instructor-led Activities:

1. The instructor welcomes and introduces the overall learning objectives of Module 2. (5 min)
2. Asks learners what they think of the significance of aviation communication, and give examples. Then plays video presentation (with English subtitles) on brief history and development of aviation communication. (5 min)
3. Plays PPT presentation (with instructor's narration) on common causes of aviation communication failures. (5 min)
4. Gives session review and summary. (5 min)
5. Provides assessment on learners' performance. (On-going process)

Tasks/Assessments for Learners:

1. Case study: Air accident and communication failures

Learners are directed to a PPT presentation of 10 world deadliest air accidents (Source: <http://www.bestcommunicationsdegrees.com/10-deadliest-air-disasters-caused-by-miscommunication>) that were caused primarily due to various communication failures, including miscommunication and incapability of communicating in English. Learners then are asked to identify possible solutions to these causes. Instructor will comment on their solutions. (15 min)

2. Group discussion: What would I do when...?

Learners are randomly paired up to 8 sub-groups, they are required to discuss first with their teammates then share their unanimous solutions on what they would do when encountering communications failures. Both verbal and written communications are allowed. The instructor then will comment on learners' performances. (15 min)

3. Document retrieving and analytical writing

Learners are given direct download link to below documents that are excerpted from ICAO. They are required to draft a short "compare and contrast" essay based on their findings in these excerpts that describe and require what pilots and ATC need to do when encountering aviation communication failures. Learners are paired up to contribute together for the draft. Instructor will comment and return the drafts prior to next session. (On-going process)

Readings:

- a. Paragraph 3.6.5.2 Communication failure in *Annex 2 - Rules of the Air*
 - b. 8.8.3 Failure of equipment & 15.3 Air-Ground Communication Failure in *Doc 4444 Air Traffic Management (PANS-ATM)*
 - c. 1.5 Communication Failure Procedures in *Doc 8168: Aircraft Operations (PANS-OPS) - Flight Procedures: Vol. 1*
- (Source: http://www.skybrary.aero/index.php/Communication_Failure:_Guidance_for_Contractors)

4. Individual learner prepares self-reflection on own performance. (On-going process)

Interval Review

Learners are free to review the video recording of this session (including all presentations), and raise questions, concerns, advices, and suggestions to instructor and the researcher via SL internal communication or IM and email.

Note: Activities labeled with “on-going process” are to be completed during interval review.

Session 2

Topic: *Communicative Avionics Used in Cockpit and ATC Tower*

Session duration: 50 min

Materials (Artifacts) used:

1. Adapted YouTube video presentation
2. PPT presentation
3. Simulative Intercommunication equipment from cockpit
4. Simulative Intercommunication equipment from ATC tower
5. Printable flashcards (in PDF format) of the pictures of intercommunication equipment and names (in separate cards) used in cockpit and ATC tower
6. Printable flashcards (in PDF format) of FAA pilot/controller glossary

Language Learning Objectives:

After completion of this session, learners are able to:

1. Describe the standard English names, abbreviations, and acronyms of the intercommunication equipment used in cockpit
2. Describe the standard English names, abbreviations, and acronyms of the intercommunication equipment used in ATC tower
3. Describe the standard English names, abbreviations, and acronyms of commonly used communication system and software used in two-way (pilot and ATC) intercommunication

Content Knowledge Objectives:

After completion of this session, learners are able to:

1. Identify and describe the appearances of intercommunication equipment used in cockpit
2. Identify and describe the appearances of intercommunication equipment used in ATC tower
3. Identify and describe the functionalities of intercommunication equipment used in cockpit
4. Identify and describe the functionalities of intercommunication equipment used in ATC tower
5. Identify and describe the two-way aviation communication mechanism

Instructor-led Activities:

1. Briefly reviews last session. (5 min)
2. Starts asking if learners have personally used or seen somebody use aviation inter-communication before, what their experiences were, and if they have found any difference between such communication and other transportation communication equipment. (5 min)
3. Plays video presentation (with English subtitles) of introduction of today's communicative avionics used in cockpit and ATC Tower. (5 min)
4. Gives session review and summary. (5 min)
5. Provides assessment on learners' performances. (On-going process)

Tasks for Learners:

1. Which is which (1): Identify the aviation communication equipment and systems

After viewing the video presentation, learners are shown a PPT presentation that randomly displays the names and pictures of various communication equipment and systems. Learners are paired up to 8 teams, each learner with in the same team is required to identify and match the names with corresponding pictures in a timed manner, only both answer correctly can score. Group discussion is allowed but the time for discussion will also be counted. The team who scores the most within the shortest time will be praised and highlighted by the instructor. The instructor then will comment on learners' performances. (15 min)

2. Which is which (2): Identify the functionalities of aviation communication equipment and systems

Similar to task 1, learners are shown a PPT presentation that randomly displays the descriptions of functionalities and pictures of various communication equipment and systems. Learners are paired up to 8 teams, each learner with in the same team is required to identify and match the descriptions with corresponding pictures in a timed manner, only both answer correctly can score. Group discussion is allowed but the time for discussion will also be counted. The team who scores the most within the shortest time will be praised and highlighted by the instructor. The instructor then will comment on learners' performances. (15 min)

3. Remember it in a flash (1): Flashcard rocks!

Learners are given printable flashcards that contain the pictures, names and brief descriptions of the functionalities of the communication equipment and systems used in cockpit and ATC tower. They are encouraged to use it during the study and for future reference and review. (On-going process)

4. Remember it in a flash (2): Flashcard rocks!

For next session, learners are given printable flashcards that contain frequently used FAA pilot/controller glossary (Source: https://www.faa.gov/air_traffic/publications/atpubs/pcg/index.htm) in bilingual (English and Mandarin Chinese) comparison. They are encouraged to preview it and raise questions during interval review. The instructor will respond accordingly. (On-going process)

5. Individual learner prepares self-reflection on own performance. (On-going process)
-

Interval Review

Learners are free to review the video recordings of this and previous sessions (including all presentations), and raise questions, concerns, advices, and suggestions to instructor and the researcher via SL internal communication or IM and email.

Session 3

Topic: *Aviation Radiotelephony Communication*

Session duration: 60 min

Materials (Artifacts) used:

1. Adapted YouTube video presentations
2. Video clips of team simulative role-playing
3. Simulative communication equipment in cockpit of one passenger airliner
4. Simulative communication equipment and systems in ATC facility
5. Printable flashcards (in PDF format) of FAA pilot/controller glossary

Language Learning Objectives:

After completion of this session, learners are able to:

1. Identify and differentiate the terminological meanings of general phraseology used in typical two-way (pilots and ATC) communications in real time
2. Distinguish and interpret (as pilots) ATC's incoming communication
3. Distinguish and interpret (as ATCs) pilot's incoming communication
4. Demonstrate competitive verbal communication (as pilots) with ATC using correct and appropriate English phraseology
5. Demonstrate competitive verbal communication (as ATCs) with ATC using correct and appropriate English phraseology
6. Cultivate the perception of the difference between English as general language and English as restricted language

Content Knowledge Objectives:

After completion of this session, learners are able to:

1. Establish and recall the usage and situation of general phraseology used in typical two-way (pilots and ATCs) communications in real time operation
2. Compare and practice (as pilots) the typical procedures of initiating contact with ATC
3. Compare and practice (as ATCs) the typical procedures of receiving initial contact from pilots
4. Complete (as pilots) the procedures of subsequent contacts and responses with ATC
5. Complete (as ATCs) the procedures of subsequent contacts and responses with pilot

Instructor-led Activities:

1. Briefly reviews last session. (5 min)
2. Displays video presentation of real time intercommunication between pilots and ATC (from pilot's perspective), then displays video presentation of real time intercommunication between pilots and ATC (from ATC's perspective). (10 min)
3. Gives session review and course summary. (5 min)
4. Provides assessment on learners' performances (end of session)

Tasks for Learners:

1. Role-playing as Pilots

Learners are led to the simulative cockpit with re-creation of pilot's intercommunication system, they are asked to do the role-playing with instructor (as ATC). They are given a specific situation (e.g., initial, subsequent, and emergent contact, etc.) to test if they are capable of successfully communicating with ATC in real-life situation. The instructor then will comment on learners' performances. (10 min)

2. Role-playing as ATCs

Similar to Task 1, learners are directed to the simulative internal facility of one ATC tower in SL to role play ATC and complete inter-communication with the instructor (as pilot), on a given situation (initiated by the instructor). The instructor then will comment on learners' performances. (10 min)

3. Group Role-playing

Similar to Tasks 1 and 2, learners are paired to 8 groups, and each member with in that team chooses his/her role to be either pilot or ATC and perform inter-communication on a given situation (provided by instructor) to see if the team cooperates appropriately and professionally. The instructor then will comment on learners' performances. (10 min)

4. What's going on? Who's doing wrong?

The instructor chooses one video clip of the recordings of Task 3, and invites learners to discuss if they perceive any merits and shortcomings from their performances. The instructor then displays a PPT presentation of evaluation criteria based on ICAO Level 4 English proficiency rating scale adapted from *Doc 9835 AN453*. (Source: <http://www.Skybrary.aero/bookshelf/books/2497.pdf>). Learners from the video clips are firstly asked to self-evaluate their performances based on this rating scale and specific situation they were situated, then the rest will complete their peer evaluation. Evaluations will be discussed together to compile as a group portfolio project for future study and reference. The instructor will comment on their performances and provide any advices and suggestions on further improving learners' performances. (10 min + On-going process process)

5. Individual learner prepares self-reflection on own performance. (On-going process)

Final Review

Learners are free to review the video recordings of this and previous sessions (including all presentations), and raise questions, concerns, advices, and suggestions to instructor and the researcher via SL internal communication or IM and email.

APPENDIX D

PRE-STUDY SURVEY

Introduction

Dear Participant,

Thank you for participating in this pre-study survey. This is an anonymous survey, so please do NOT indicate your real name. As part of the proposed Second Life (SL) study, this pre-study survey aims to obtain basic information of your educational background including academic program, English proficiency (by test score) and professional/career plan. In order to help researcher acknowledge something about you as a respondent to this survey, please answer ALL of the following items.

Please note that your real identity will NOT be known. The survey result is for researcher's analysis ONLY, and will NOT be distributed to third party.

Basic Information

Avatar display name: _____ (NOTE: Do NOT use your real name)

QQ No.: _____ (NOTE: Your QQ number will be labeled and associated with your SL display name)

Email: _____ (NOTE: Please provide a valid email address that does NOT contain your real name and any identifiable information)

Gender: [] Male [] Female [] Prefer not to say

Age: _____ (Must be at least 19 at the time participating in this study)

Educational Background

Institution: _____ (optional)

Current academic level: Sophomore _____ Junior _____ Senior _____

Major: _____ Minor: _____ (leave blank if none)

Aviation-related courses taken: _____ (use comma to separate course name)

Aviation-related course(s) taught in pure English or bilingual (English vs. Mandarin Chinese):
_____ (use comma to separate course name)

English Proficiency

1. What was your CET (College English Test) Band 4 and/or Band 6 score?

Band 4: _____ Band 6: _____

2. Please check below standardized English exam(s) that you have taken, and indicate the final score(s):

- [] TOEFL (Score : _____)
- [] IELTS (Score : _____)
- [] TOEIC (Score: _____)
- [] iTEP (Score: _____)
- [] BEC (Score: _____)
- [] PTE Academic (Score: _____)
- [] PTE General (Score: _____)

Other(s): Please indicate _____ (Score: _____)

(Score: _____)

3. Have you studied in an English-speaking country/region before?

(If no, please DISREGARD item 4 and move on to next section).

4. If you chose YES in item 3, please answer below items accordingly:

Destination country/region: _____

Program of study: _____

Academic level: _____

Academic or Professional Plan

Please choose and complete only ONE of the THREE statements shown below that best describes your actual situation and future consideration:

1. After graduation, I plan to continue my postgraduate study

- [] within the same or similar academic program (discipline) as my undergraduate.
- [] in another academic program (discipline), which is _____.

2. After graduation, I plan to work

- [] In a position related to my undergraduate major.

Please enter position name: _____

- [] In a position different from my undergraduate major.

Please enter position name: _____

3. Other, please specify_____.

Survey Questions

1. Why did you choose to participate in this study? Please choose ALL that apply to your situation:

- Personal need/interest
- Academic/educational need
- Professional need
- Researcher's recruitment/professor's requirement to participate
- Other, please specify _____

2. Are you satisfied with your current "in-classroom" English learning?

- Very dissatisfied
- Dissatisfied
- Somewhat dissatisfied
- Neutral
- Somewhat satisfied
- Satisfied
- Very satisfied

3. Choose ALL factors that you feel difficult/negative/challenging in learning English in your current classroom.

- Ineffective
- Unenjoyable
- Tedious and boring
- Impractical
- Exam-oriented
- Lesson not taught in an English-speaking only environment
- Limited/no access to learning resources used in English-speaking countries
- Less autonomous
- Less qualified instructors
- Less interaction/communication with instructor and peers
- Other, please specify _____

4. Are you willing to take any action to improve your current English learning?

- Yes
- No
- I don't know
- I prefer not to say

5. What is your perception of the benefit of learning English in your current academic program?
Choose ALL that apply.

- Academic/educational requirements (e.g., CET Band 4/6 exams)
- Personal need/interest (e.g., English broadens my vision. I like reading in English.)
- Professional need (e.g., job-hunting, position prerequisite, more work opportunities)
- Other, please specify _____

6. What are the professional benefits, if any, of English competency? Please explain in detail.

7. What are the personal benefits, if any, of English competency? Please explain in detail.

8. What is Second Life (SL)? (Choose ONE)

- An online game
- A VLE (virtual learning environment)
- An online game and VLE
- Other, please specify _____

9. Do you think learning English with educational technology (e.g., SL) (Choose ALL that apply):

- Effective
- Enjoyable and fun
- Engaging
- Reduces anxiety and pressure
- Enables more autonomy
- Other, please specify _____

10. Have you used SL before?

- Never
- Often
- Sometimes
- Seldom

11. If you have ever used SL, how would you describe your PRIMARY use of SL? (Leave it blank if you chose NEVER in Question 10)

- Recreational/game
- Professional
- Academic/educational
- Personal
- Other, please specify _____

12. How would you categorize your SL experience level? (Leave it blank if you chose NEVER in Question 10)

- Expert
- Average
- Novice
- No experience

13. Have you ever taken an online course before? If no, leave it blank and please click on next button. If yes, do you prefer learning in synchronous (instructor and learner are online at the same time) or asynchronous (instructor and learner are NOT online at the same time) mode, or both? Please explain in detail.

---END OF SURVEY---

Thank you for completing this survey! Your time and participation are greatly appreciated!
When you are done, please review to make sure you have answered all questions based on your
actual situation, then please click arrow button on the right, a confirmation message will appear
on the screen shortly.

APPENDIX E

POST-STUDY INTERVIEWS

Questions for Individual Learner Participant

1. What did you think of your experience learning English in Second Life (SL)? How does it compare to learning in a traditional classroom? Which do you prefer: SL, traditional classroom, or classroom with SL as supplement? Please explain in detail.
2. Do you consider SL an effective learning environment for learning content knowledge and English? Have you perceived any advantages and/or disadvantages? Please explain in detail.
3. What was your perception of your ability to take control of own learning in SL? Did it help you better focus on the learning objectives and ensure smooth learning process? Please explain in detail.
4. What was your perception of collaboration and interaction with instructor and among peers? Do you think they are essentially important in your language learning process? Please explain in detail.
5. Do you think activities like PPT/video presentations and Orientation, and tasks like group discussion, paired team work, and simulative role-playing engage more collaboration and communication between you and the instructor, and among peers? Please explain in detail.
6. Do you think activities and tasks designed in SL engage you to effectively learn more than what you used to learn in the traditional classroom? Please explain in detail.
7. Overall, what was your learning experience in SL?
 - a. Have you gained satisfactory English competency while acquired certain new content knowledge and/or mastered necessary skills? Please explain in detail.
 - b. Have you achieved your specific goals set at the beginning of the study? Please explain in detail.
8. Are you willing to utilize SL for your future English learning? Please explain in detail.
9. Anything else you would like to add about your learning experience in SL.

Questions for Instructor Participant

1. What are some of the advantages/benefits you have perceived about teaching in SL?
2. What are some of the challenges/difficulties you have perceived about teaching in SL?
3. Do you consider SL an instructionally applicable environment/platform for content knowledge and English learning? Please explain in detail.
4. Which group do you think did better in regards to learning outcomes and effectiveness: the learners in SL or those (non-English native speakers) whom you have taught in traditional classroom? Can you give me some details and examples?
5. Any advices and suggestions you would like to address/discuss about the instructional design/affordances in SL.
6. Are you willing to adapt SL for your future teaching? Please explain in detail.
7. Anything else you would like to add about your teaching experience in SL.

APPENDIX F

OBSERVATION PLAN

1. Before the formal in-world observation begins, the researcher is responsible for:

- Setting up the instructor's computer that includes installing Second Life Viewer and helping instructor familiarize with the software. The researcher also checks internet connectivity and headset with instructor's computer to make sure there is no noticeable technical issue.
- Minimizing interference and interruption to instructor by separating the instructor and the researcher into two contiguous and sound-proof rooms. For this study, the researcher also creates an avatar of his own as an in-world observer (who does not involve active interaction and communication with both instructor and learners) in the VLE of SL under his discretion, so he can utilize Camtasia Studio from his computer to observe and record in-world activities. By doing so, synchronous instruction in SL can be faithfully and thoroughly recorded to help the researcher better understand how learner participants interact and communicate with instructor and peers in SL. This strategy also ensures that if one computer malfunctions, the other can still record.
- Scheduling and ensuring learner participants in China are well-prepared in advance for the in-class sessions. This includes assurance of proper functionality of their hardware, software and internet connection, and confirmation of non-conflict schedules between SL in-class sessions and their own on-campus study. Researcher remains online with learner participants via IM software QQ throughout the in-world sessions to help troubleshoot any technical problem.
- Distributing fillable PDF-formatted informed consent forms via both email and QQ to participants so they can consent the form electronically. This reduces the risk of missing document during physical mailing and is cost and time effective.

2. Before first class session, the researcher should:

- Reiterate and detail the study (via IM) including research goals, instruments to be used, participants' requirements, and expectations. Learner participants are allowed to raise any questions about the study. It is researcher's responsibility to ensure that everyone fully acknowledges about the study.

3. During each class session, the researcher should:

- Monitor his own computer and audio-video record in-world activities via Camtasia Studio.

- Translate (via IM) English aviation-related terminologies/jargons, phraseology, and concepts to Chinese, if necessary.
- Help trouble shoot (via IM) any technical issues for learner participants.
- Keep observation log.

4. After each class session, the researcher should:

- Collect recordings from his own and instructor's computers.
- Transcribe audio recordings verbatim with InqScribe, and have participants review and approve for the final version of transcripts before analysis. Individual transcript is labeled by participants' display names in order to maintain their confidentiality.
- Pre-schedule with instructor and students for next class session, and ensure adequate time for re-schedule if needed.
- Answer questions and concerns, and receive feedback, suggestions, and advices from participants.
- Review and modify observation log.

APPENDIX G

OBSERVATION LOGBOOK

Date: _____

Attendance: Full [] Absence _____ [Display Names]
Class began at: _____ Ended at: _____ [CDT]
Class Session No.: []

Today's topic: _____

Learning Objectives

Language

1. _____
2. _____
3. _____

Content knowledge

1. _____
2. _____
3. _____

Tasks

Individual tasks: Avatar name _____

- Task 1: _____ Completed [] Unfinished [] Note: _____
Task 2: _____ Completed [] Unfinished [] Note: _____
Task 3: _____ Completed [] Unfinished [] Note: _____

Group tasks: Group no. []

- Task 1: _____ Completed [] Unfinished [] Note: _____
Task 2: _____ Completed [] Unfinished [] Note: _____
Task 3: _____ Completed [] Unfinished [] Note: _____

Incidences

1. Technical

2. Communication/Interaction

3. Instructional & Task Design

Instructor's Assessment on Learners' Performances

1. Display name []

2. Display name []

3. Display name []

Learners' Self-reflections

1. Display name []

2. Display name []

3. Display name []

Transcriptions of In-world Communication (Audio)

1. Display name [] Document ID: _____

2. Display name [] Document ID: _____

3. Display name [] Document ID: _____

Transcriptions of In-world Communication (Text)

1. Display name [] Document ID: _____

2. Display name [] Document ID: _____

3. Display name [] Document ID: _____

NOTE: Instructor's assessment, learner's self-reflection, and transcriptions are filed as individual portfolio during data analysis.

Media Attachments

Original screen capture file [from researcher's computer]

File No. _____

Original screen capture file [from instructor's computer]

File No. _____

APPENDIX H
DOCUMENT SUMMARY FORM

Name of Document: _____

Type of Document: _____

Document No.: _____

Date of Document: _____

Date Received: _____

Description of Document: _____

Event or Contact with Which Document is Associated: _____

Descriptive

Evaluative

Other _____

Page #	Keywords/Concepts	Comments: Relationship to Research Questions

Brief Summary of Contents:

Significance or Purpose of Document:

Is There Anything Contradictory About Document?

Yes

No

Salient Questions/Issues to Consider:

Additional Comments/Reflections/Issues:

APPENDIX I

IRB APPROVAL

May 12, 2015

Office for Research

Institutional Review Board for the
Protection of Human Subjects



Fang Li
ELPTS
College of Education
Box 870302

Re: IRB # 15-OR-158, "Learning beyond Language: English for Specific Purposes (ESP) Learners' Experience in the Second Life World"

Dear Mr. Li:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of written documentation of informed consent. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your application will expire on May 10, 2016. If your research will continue beyond this date, please complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, please complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure Form.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,



The University of Alabama



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