

**LEXICAL COMPLEXITY, INTERACTIVE COMPETENCE AND
PARTICIPATION STYLE OF ESL LEARNERS
IN FACE-TO-FACE AND ONLINE DISCUSSIONS**

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**FACULTY OF LANGUAGES AND LINGUISTICS
UNIVERSITY OF MALAYA
KUALA LUMPUR**

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**FACULTY OF LANGUAGES AND LINGUISTICS
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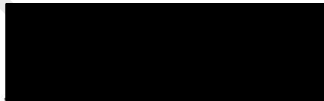
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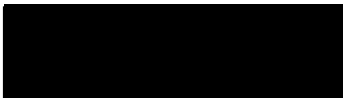
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ABSTRACT

To gain a better understanding of the potential of synchronous online discussions, this study compared the ESL learners' participation styles and discourse which displayed lexical complexity and interactive competence in online and face-to-face discussions. The influence of the learners' personality and language proficiency in different discussion settings was also investigated. *The Ecological Model of the Communication Process* (Foulger, 2004) was used as a theoretical framework in this study. The type of personality focused on in this study was the extroversion and introversion of the learners while the language proficiency of the participants of this study was either high-intermediate or low-intermediate. The mixed-method approach used in this study employed the concurrent transformative design in which quantitative and qualitative data were gathered from the stage of data collection to data analysis. This measure can triangulate the data and give better support for the findings. In this study, the quantitative method was utilised to collect and analyse the data gathered from the quasi-experiment and the survey carried out after that. Meanwhile, the qualitative method was used in the collection and analysis of the online feedback session, the learners' comments in the survey and their responses during the experiment (based on the transcripts and researcher's observation). Eight sessions of face-to-face and online discussions have been carried out weekly for over a month with two matched-samples groups alternating weekly from online to face-to-face settings. Each group consisted of 24 sixteen-year-old Form 4 ESL students from a secondary school in Kuala Lumpur. This study found that the use of a synchronous online setting can be very helpful in balancing the participation of the learners and eliciting more contribution of words; especially among the introverts and the less proficient ESL learners. The less proficient

learners have also shown better interactive competence in online discussions. The empirical evidence from this experimental study showed that the online environment can be a good alternative platform for discussions to be held. Following Foulger's (2004) *Ecological Model of the Communication Process* and the SLA theories, the communication process in discussions can be made more effective in the synchronous online medium as the learners' affective filter became lower and they felt more confident and motivated to engage themselves with the interactive language practice. From the findings of this study, a model which described the communication process among the ESL learners in face-to-face and online environment was drawn and named *The Group Discussion Model for ESL Learners*. Suggestions for facilitating discussion activities in an ESL classroom were also provided. All in all, the use of technology in an ESL classroom should be promoted. More importantly, the learners' personalities and language proficiency should be considered when choosing the discussion setting and facilitating the discussion activities.

ABSTRAK

Bagi memahami potensi perbincangan dalam talian dengan lebih lanjut, kajian ini membandingkan gaya penyertaan pelajar ESL (bahasa Inggeris sebagai bahasa kedua) dan wacana bahasa Inggeris mereka yang memaparkan kerumitan leksikal dan keupayaan berinteraktif apabila berbincang secara bertatap muka dan dalam talian yang dilakukan secara segerak. Pengaruh personaliti dan tahap penguasaan bahasa pelajar dalam perbincangan yang berbeza juga disiasat dalam kajian ini. Jenis personaliti yang tertumpu dalam kajian ini adalah dimensi ekstroversi dan introversi pelajar. Dalam kajian ini, reka bentuk penyelidikan kaedah bercampur telah digunakan di mana data kuantitatif dan kualitatif telah dikumpul dari peringkat pengumpulan data ke peringkat analisis data. Langkah yang dipilih ini boleh memberi sokongan yang lebih baik kepada hasil kajian. Kaedah kuantitatif telah digunakan untuk mengumpul dan menganalisis data yang dikumpul daripada kuasi-eksperimen dan soal selidik. Kaedah kualitatif pula telah digunakan dalam pengumpulan dan analisis data yang didapati daripada pemerhatian semasa eksperimen dan sesi maklum balas dalam talian. Lapan sesi perbincangan bertatap muka dan dalam talian telah dijalankan setiap minggu selama sebulan dengan dua kumpulan yang mempunyai sampel yang dipadankan. Peserta kajian ini terdiri daripada 48 pelajar ESL tingkatan 4 (berusia 16 hingga 17 tahun) yang sedang belajar di sebuah sekolah menengah di Kuala Lumpur. Kajian ini mendapati bahawa perbincangan dalam talian yang dilakukan secara segerak boleh membantu mengimbangi penyertaan pelajar semasa perbincangan. Perbincangan dalam talian juga memperlihatkan sumbangan perkataan yang lebih banyak dan wacana yang memaparkan kerumitan leksikal yang lebih tinggi, terutama di kalangan pelajar yang mempunyai tahap penguasaan bahasa Inggeris yang lebih rendah dan mempunyai

personaliti introversi. Pelajar yang mempunyai tahap penguasaan bahasa Inggeris yang lebih rendah juga telah menunjukkan keupayaan berinteraktif yang lebih baik semasa berbincang secara dalam talian. Berdasarkan pada bukti empirikal dari kajian ini, proses perbincangan boleh diadakan dengan lebih berkesan secara dalam talian kerana pelajar adalah lebih yakin dan bermotivasi. Dari dapatan kajian ini, sebuah model yang menerangkan proses komunikasi di kalangan pelajar dan cadangan untuk menjadikan aktiviti perbincangan lebih efektif di dalam kelas ESL telah disediakan. Kesimpulannya, penggunaan teknologi di dalam kelas ESL harus digalakkan. Personaliti pelajar dan penguasaan bahasa juga perlu dipertimbangkan apabila memilih medium perbincangan.

University of Malaya

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LIST OF TERMS

CALL	Computer-assisted language learning
CMC	Computer-mediated communication
ESL	English as a second language
SLA	Second language acquisition
Online discussions	The exchange of messages which are held synchronously or asynchronously in written electronic form through the mediation of computers
Face-to-face discussions	Traditional discussions held in a meeting room with the teacher posting a topic for students to share and exchange their views
High-intermediate learners	The more proficient ESL students who are compared to the less proficient or low-intermediate learners
Low-intermediate learners	The less proficient ESL learners who are compared to the more proficient or high-intermediate learners
Extroverts	Students who have more interest in socialising with wide range of people and events and prefer interactive learning activities
Introverts	Students who tend to avoid social contacts with unfamiliar people and prefer more independent learning activities
Target language	The learners' second language which is English language.
Participation style	The particular way students react when they participate in discussions. In this study, the interest is on whether the participation is balanced or imbalanced among the different groups of learners.
Lexical complexity	This refers to the ability of students to show a wide range of topic-related vocabulary. This does not mean the use of difficult words but unique words (words which are different).
Interactive competence	The ability of students to interact or communicate with others using language functions (e.g. <i>yes, I don't think so, thank you, I'm sorry</i>)

CHAPTER ONE

INTRODUCTION

1.1 Overview

Within the field of second language acquisition (SLA), this study investigated the role played by technology on ESL (English as second language) learners' participation style and production of target language. The ESL learners' performance in computer-mediated communication (CMC) was compared to the traditional face-to-face communication so as to highlight the differences in their performance in different conditions. In this study, CMC was defined as the interactions that occurred between humans with the aid of computers (December, 1996; Herring, 2001; Walther, 1992).

In the context of SLA, CMC played a vital role in promoting a high-level interaction (Chun, 1994; Kern, 1995; Pellettieri, 2000; Salaberry, 2001; Smith, 2003). CMC was thus believed to be able to fulfil the principles of communicative language teaching by providing more communicative practices with the use of technology (Tam, Kan & Ng, 2010). In addition, CMC also fit into the criteria of communicative computer-assisted language learning (CALL) which was defined and promoted by Underwood (1984). This was because CMC was flexible, used natural target language, involved no evaluation but authentic and meaningful communication, induced implicit learning of grammar and focused on acquisition rather than formal learning practices (Underwood, 1984). However, some literature described CMC as unsuitable for social interaction due to the lack of nonverbal cues and research has also found that the users of CMC showed less satisfaction in discussions held in CMC environments than in face-

to-face environments (Herring, 2001; Kiesler, Zubrow & Moses, 1985; Simon, 2006). Thus, prudent evaluation of the use of CMC in second language learning is crucial for more effective use of it in ESL classes.

In this initial chapter, the important parts that are covered include the background and the purpose of this study, the research questions, the limitations and the significance of this research.

1.2 Background of the Study

English is indispensable as the language of communication.

(Zuraidah, 2012, p.1)

Much emphasis has always been put on teaching English language as a second language (ESL). This emphasis is heightened by globalisation which has encouraged the use of English language as an international language (Zuraidah, 2012). English language has also become very important in enabling Malaysians to access the sources in critical fields such as science, technology, trade, business, commerce, media and more to be competitive in the knowledge-based society (Asha, 2012). Apart from that, the need to increase the command of English language among the citizens is also due to the worrying scenario that the English language standard in Malaysia has deteriorated (Asha, 2012; Kow, 2012).

In the attempts to improve the English language proficiency among the ESL learners, the Malaysian government has introduced the policy of *Upholding the Malay Language and Strengthening the Command of English*. This policy was implemented

after the decision to convert the English language as the medium of instruction for Science and Mathematics subject to the national language, that is, the Malay language (MOE, 2010). Other corrective measures being undertaken by the Ministry of Education include allocating an extra period for English language lessons in schools and implementing *Early Literacy through English Programme* (English on the double, 2007; MOE, 2010). However, more importantly, the problem of falling standards in English has to be dealt with from the school level with emphasis on the teaching and learning strategies (Kow, 2012).

To improve the English language command among the Generation Y students who are generally more internet savvy and less receptive to taking down notes from the blackboard, teachers are urged to keep abreast of recent developments and utilise technological teaching tools in this digital era (Bernama, 2010). Furthermore, technology is able to expand the learners' knowledge to beyond the classroom and fasten the pace of teaching (Asha, 2012). The use of technological teaching tools is also much encouraged as it is in line with one of the seven educational emphases in Malaysian English language curriculum – information and communication technology (ICT) skills which encourage learners to build and sustain relationships through social interactions with people from local and overseas using multimedia resources (MOE, 2003). The emphasis on learning with technology has prompted researchers to find out the apt role for new technology (Golas, 2002 as cited in Tutty & Klein, 2008).

The integration of technological tools in the classroom has been widely researched since its introduction and the internet is one of the most popular tools for language learning and teaching since the early 1990s (Hamat, 2008). Currently, the paradigm shift from traditional face-to-face classrooms to online learning communities

can be observed (Chou, 2001). This is because learners believe strongly in the ability of technology to provide them enriched learning experiences and they see themselves using technology tools in their future (Solomon & Schrum, 2007). With the advent of the Internet, learners can now use this new technology to voice their thoughts through discussions that can be held online, whether synchronous or asynchronous and they can be found in chat rooms, online forums, emails, social networking sites and other websites or devices which allow users to discuss topic(s) through computer network (Wang & Woo, 2007).

With the popularity of internet in this 21st century, online discussions have become very crucial and require serious study and pedagogical attention (Lotherington, Neville-Verardi & Ronda, 2009). More information about online discussions when compared to face-to-face discussions is provided in the next section.

1.2.1 Face-to-face and Online Discussions

In this study, face-to-face discussions refer to traditional discussions in which the members share and exchange their opinions in a face-to-face environment. On the other hand, online discussions refer to the exchange of messages which are held in written electronic form through the mediation of computers. The online discussions can be held synchronously or asynchronously but the participants in this study have participated in a synchronous manner.

In online discussions, participants do not need to take turns to comment because all can post their messages at the same time, creating online conversations with multiple parallel threads (Fitze, 2006). The idea of online discussions in this research is similar

to Warschauer's (1996) 'electronic discussion' and Fitze's (2006) definition of 'written electronic conference'. The term 'online discussion' is used here instead of Warschauer's (1996) 'electronic discussion' to show more specifically that the discussion is held online through internet connection even though both are using computers. The word 'conference' in Fitze's (2006) term 'written electronic conference' is replaced with 'discussion' to suggest that it is less formal since the word 'conference' implies a more scholarly and academic type of sharing. In this study, the word 'discussion' suggests a semi-formal type of conversation which is less formal compared to 'conference' but more formal compared to 'chat'. The word 'discussion' is also used instead of 'conference' in this research to not astound the mere 16-year-old ESL learners who are still in secondary school and are not familiar with the idea of conference yet. The word 'conference' may be more suitable to be employed by Fitze (2006) whose sample consists of more mature university students. The clarification of different terms is made here to give readers a clearer idea of the type of discussion that is to be held in this study and to avoid confusion of the terms used by different authors. Even though different terms have been used by Warschauer (1996), Fitze (2006) and this study, the idea of 'electronic discussion', 'written electronic conference' and 'online discussion' is the same. They all express the idea of computer-mediated communication in written form.

Different communication skills are involved in face-to-face and online discussions. In face-to-face discussions, listening and speaking skills are most evident while online discussions are mainly dominated by reading and writing skills when one communicates through a text-based platform (Fitze, 2006; Perkins & Newman, 1999). Even though face-to-face and online discussions employ different skills, they are compared to in this study because of their similarities in being interactive, personalised,

relatively informal and require the participants to meet at the same time to work collaboratively (Lapadat, 2002; Nunan, 1999; Yates, 2001). Moreover, both online and face-to-face discussions offer prompt feedback and the discourse produced are also found similar with a variety of discourse markers, speech acts, negotiation strategies and many short single-lines messages (Al-Shalchi, 2009; Blake, 2000; Darhower, 2002; Lee, 2009; Smith, 2008; Tudini, 2002; 2003; Yates, 1996; 2001).

Due to the predominant use of reading and writing skills in online discussions, participants in online discussions need to spend more time to process the messages when they read and when they type (Abrams, 2003). However, the visual salience of the messages and self-paced setting in online discussions enable ESL learners to have more time to ponder on the recorded previous messages and their own productions before sending their responses online (Hamat, 2008; Lee, 2009; Lever-Duffy & McDonald, 2011; Sotillo, 2009). This does not only reduce the fear of failure among the second language learners but it could also encourage critical thinking and empower them to pursue knowledge more independently (Jonassen, 1994, p.6; Sengupta, 2001; Ware, 2004). Apart from that, learners also have higher chances to notice the errors made and modify their output when they negotiate online (Blake & Zyzik, 2003; Lai & Zhao, 2006; Lee, 2006; Shekary & Tahririan, 2006; Smith, 2008; Sotillo, 2009, Warschauer, 1997). Since enhanced noticing and engagement are associated with second language learning, online discussions have the potential to offer new learning opportunities that face-to-face discussions may not be able to.

In online discussions, *text chat* is usually used by participants when they interact. Text chat refers to “a kind of semi-speech that is between talking and writing” (Lee, 2009, p.128). Though text chat is in written form, it is comparable to face-to-face

interactions due to its conversational style which includes discourse markers and a variety of speech acts such as greeting, praising, clarifying, requesting, apologising and etc. (Sykes, 2005). Text chat is usually found in synchronous online discussion rather than asynchronous discussion for it is fast paced and more spontaneous (Lee, 2009; Toyoda & Harrison, 2002). In synchronous online discussions, members are also often found to write in brief and in an informal way with abbreviations, misspelling and unconventional punctuation (Lee, 2009; Toyoda & Harrison, 2002).

Even though online discussions are similar to face-to-face discussions in terms of their pace, spontaneity and conversational style, the online setting does not have the advantage of nonverbal cues and prosodic features as can be found in face-to-face interactions (Lee, 2009). With the absence of facial expressions, body gesture and intonation, participants in online discussions usually show their emotions through the use of onomatopoeia and emoticons which give visual clues but not real human emotions (Hamat, 2008; Lee, 2006). Problems of misunderstanding are thus found harder to be overcome in online discussions due to unclear context and reference of messages (Lee, 2009).

Interestingly, the lack of visual and auditory paralinguistic cues in online discussions is a limitation that has been found to encourage more language output with wider range of topic-related vocabulary to be used by the ESL learners (Abrams, 2003; Fitze, 2006; Hamat, 2008). This is because the learners need to use explicit language to convey their emotions and thoughts in the absence of body language and facial expressions (Hamat, 2008; Kern, Ware & Warschauer, 2008). Furthermore, the barriers such as accent, appearance and other visual and aural paralinguistic cues are eliminated in online discussions. When these barriers are removed, the participants become more

interactive and collaborative (Chong, 1998). As a result, learners use more complex language and display more communicative or interactive competence for speech acts like greetings, beginning and ending of discussions, clarifications, elaborating ideas, gaining attention, providing comments, apologising and taking turns (Chun, 1994).

With the absence of non-verbal cues in an online setting, the ESL learners who feel shy or less orally competent to share during face-to-face discussions can perform better in channelling their thoughts in online discussions (Hamat, 2008; Kamhi-Stein, 2000; Schallert et al., 1998). Thus, participation from learners in online discussions becomes more balanced (Beauvois, 1992; Chun, 1994; Fitze, 2006; Kelm, 1992; Kern, 1995; Sotillo, 2009; Warschauer, 1996). This differs from the often crowded face-to-face discussions in a traditional classroom whereby equal chances for every learner to express their views are rare (Lever-Duffy & McDonald, 2011). As a consequence, the more reserved introverted students are often ignored and left behind (Lever-Duffy & McDonald, 2011).

In online discussions, students are found to be more active in sharing their views, knowledge and experiences to support each other, construct new understanding and form relationships (Hamat, 2008; Kamhi-Stein, 2000; Sengupta, 2001). This creates a positive environment for learner-learner interactions and cooperative learning (Chun, 1994; Fowler & Wheeler, 1995). In accordance with Long's Interaction Hypothesis (1996), a dynamic student-centred discussion can aid language learning (Blake, 2000; Darhower, 2002; Sotillo, 2009). Thus, it is not surprising that the learners' written and oral skills have improved in the online setting (Abrams, 2003; Blake, 2000; Kitade, 2000; Payne & Whitney, 2002) and the same goes for the learners' grammatical competence (Dussias, 2006; Lee, 2009; Pellettieri, 2000).

Though there are many benefits of participating in online discussions, instructors are cautioned to integrate it well in the classroom and to take note of the shortcomings such as lack of social or paralinguistic clues, access problems and loss of teacher's humanity and charisma (Hamat, 2008; Pollock & Squire, 2001; Tiene, 2000). Furthermore, computers are not hundred per cent reliable and can cause inconvenience such as waste of time when it fails to work due to virus infection or network problems (Berge, 1995). Though the value of online discussion as an important tool for learning English language is undeniable, the use of it must be careful as it can be addictive or interfere with face-to-face contacts (Berge, 1995). Teachers would also have to rethink the teaching and learning process as the use of technology is not simply an addition to the educational process (Laurillard, Oliver, Wasson & Hoppe, 2009). Teachers need to understand the use of online discussions so that it would not be an inconvenience or even lessen the teaching and learning effectiveness when used inappropriately (Laurillard, Oliver, Wasson & Hoppe, 2009).

Both face-to-face and online discussions have their own particular affordances in supporting SLA (Ellis, Goodyear, Calvo & Prosser, 2008). To integrate them effectively in an ESL class, the individual differences among learners also need to be looked into. The following section explains the importance of learning about learners' individual differences in which this study places importance in when investigating the potential of face-to-face and online discussions in an ESL class.

1.2.2 Individual Differences

Consideration to the influence of individual differences is needed when a teacher intends to utilise discussion as a learning activity. This is because people are unique and have different preferences depending on the person's characteristics, gender, motivation, aptitude, learning style and proficiency of the target language (Arthur, 2010; Fitze, 2006; Oxford, 1996).

Since each learner is special and has their own learning approaches, the ESL language instructors need to understand the learners' style in accomplishing a certain task or goal and identify the facilities or settings that would enable them to learn and use the target language more effectively.

As a certain discussion setting may be favourable to a certain group of learners but not for the others, it is important for language instructors to cater to the learners' needs for a more effective teaching and learning process. The individual differences that are focused on in this study are the personality and language proficiency of the learners. Specifically, the personality refers to the extroversion and introversion of the learners while language proficiency refers to the more proficient and less proficient learners.

Personality and language proficiency can affect a learner's thinking, choices, actions and behaviour (Arthur, 2010). For instance, an extrovert who is more outspoken and sociable may learn a language more easily since they are more willing to use the target language to socialise with the others and are less afraid to make mistakes. Likewise, the more proficient language learners may be more confident and motivated to use the target language compared to the less proficient learners. Thus, if the

personality and language proficiency of the learners are not considered during the teaching and learning process, the less proficient introverted learners may be at a disadvantage especially since their language learning strategies are limited (Arthur, 2010).

Studies have also found that the extroverted and introverted learners who have different levels of language proficiency behave differently in online discussions (Chen & Caropreso, 2004). They showed different communication patterns and Chen and Caropreso (2004) inferred that the learners may prefer different methods of communication and this could influence their style of participation and language output in different discussion settings. However, empirical study of this area is scarce and this brings on the next section which explains the statement of problem that motivates the present study.

1.3 Statement of Problem

In the researcher's own ESL classes, the researcher has tried to encourage the learners to speak using the target language or English as a second language through a number of discussion activities. However, quite often, the face-to-face discussions were dominated by certain learners who were more proficient and extroverted in nature while the introverted and less proficient learners usually kept quiet or only answered briefly when asked. The researcher hopes that the participation of the learners can be more balanced in class and that more learners can be using the target language actively. Having learned the potential benefits of online discussions and yet not knowing how effective it is to different groups of learners, the researcher intends to study this issue.

In this era, almost every school is equipped with Internet access and computers to help learners to learn more effectively and be prepared to be the future workforce of the technology-driven world (Inan & Lowther, 2010). In Malaysia, the Ministry of Education (MOE) has even started introducing high-speed wireless 4G mobile Internet together with the Frog Virtual Learning Environment (VLE) under the 1BestariNet project to all schools nationwide (AvantiKumar, 2013; MOE, 2012). However, the increasingly common use of technology in schools does not automatically bring about an improvement in the teaching and learning process (Lim & Chai 2008). The empirical support that claims the use of technology leading to increased test scores, instruction quality and improved learning is still insufficient. Studies have also shown that the disappointing results of the use of technology are frequently linked to the lack of necessary skills for technology integration in classroom instruction among the teachers (Baylor & Ritchie 2002; Eteokleous 2008). The ability to effectively integrate the use of technology in classroom instructions is a complex process and needs further studies (Levin & Wadmany 2008; Valcke et al, 2007 as cited in Inan & Lowther, 2010).

The following section identifies the gap in the current literature which motivates the present study.

1.4 Research Gap

The area of technology-enhanced language learning is still relatively unexplored until recently when the expansion of broadband services allow for more accessible network connection around the world (UNESCO, 2013; Williams & van Compernelle, 2012).

To date, a number of studies have been done to compare the traditional face-to-face discussions which are conducted in a classroom and the online discussions which are held in an off-class setting but few studies have compared the incorporation of both face-to-face and online discussions in a classroom setting (Wang & Woo, 2007). Conducting a study which compares both online and face-to-face discussions in a classroom setting is crucial as the findings could enlighten language instructors with practical implications and suggestions that can be transferred to their own ESL classrooms. Moreover, a study that is conducted in a classroom setting may be able to uncover more surprising elements from the unpredictable moments and situations as faced by the ESL language instructors in a classroom.

Thus far, even though the relationship between learners' individual differences and computer-mediated communication (CMC) has been studied, there is little research which investigates how the potential benefits of online discussions can benefit ESL learners of different personalities and language proficiency (Ellis, Goodyear, Calvo & Prosser, 2008; Sharpe & Benfield, 2005). Apart from that, Fitze (2006) has also cautioned the readers that a number of studies which compare the discourse and patterns of participation of ESL learners in discussions held online and face-to-face are anecdotal. In addition, studies are rarely conducted with controlled experimental groups but more at qualitative level (Roberts, 2004; Tam, Kan & Ng, 2010).

The current literature gap suggests a need for research which uses controlled experimental groups to compare the performance of the ESL learners who have different personalities and language proficiency in in-class online and face-to-face discussion settings. The purpose of the present study is explained in the next section.

1.5 Purpose of the Study

It is crucial to understand the way learners form the discourse for discussions held in different settings (Abraham & Williams, 2009a). Thus, this study investigates the capability of different mediums of discussions in influencing the participation style and language discourse of ESL learners.

With regard to the participation style of the ESL learners, this research looks at the contribution of words by the ESL learners in online and face-to-face discussions (please refer to *Section 3.11: Data Analysis* and *Section 4.3: Contribution of Words* for the methods and findings). From the learners' contributions, the participation style is analysed to find out the equity of participation among the learners in different discussion environments (please refer to *Section 3.11: Data Analysis* and *Section 4.4: Balanced Participation* for the methods and findings). The significance of examining learners' contribution of words and equity of participation is explained in *Section 1.8: Significance of the Study*.

Due to the wide scope of language discourse, this study only focuses on the lexical complexity (please refer to *Section 3.11: Data Analysis* and *Section 4.5: Lexical Complexity* for the methods and findings) and interactive competence (please refer to *Section 3.11: Data Analysis* and *Section 4.6: Interactive Competence* for the methods and findings) of the ESL learners' productions. In this study, lexical complexity refers to the learners' ability to use a wide range of topic-related vocabulary while interactive competence refers to the learners' ability to communicate with others using language functions. The lexical complexity and interactive competence shown by the ESL learners in different discussions settings are looked into so as to gather insights on the

learners' use of vocabulary and language functions in different discussion environments. The findings can then inform the ESL researchers, instructors and syllabus designers about the affordances that can be exploited by online or face-to-face settings in helping ESL learners to master the second language by increasing their grasp of vocabulary and improving their communication skills with appropriate use of language functions.

Since differences among learners exist and must be catered to for effective education (Skinner, 1968), the influence of ESL learners' personality and language proficiency on their participation style, lexical complexity and interactive competence in different discussion settings are also investigated in this research. The personality type focused on in this study is the extroversion and introversion of learners because previous studies have found introverts to be better in channelling their ideas online (Hamat, 2008; Kamhi-Stein, 2000; Schallert et al., 1998). In addition, learners' language proficiency has also been found to impact on their language production in online discussions (Arslanyilmaz, 2012). This research thus intends to forge further ahead and aims to study the relationship between the learners' individual differences (personality and language proficiency) and their participation style as well as discourse which displays lexical complexity and interactive competence in online and face-to-face discussion settings.

This research also works on the limitations in Warschauer's (1996) and Fitze's (2006) study. The selection of sample in this study is more controlled as the personality and proficiency level of the learners are taken into account. Furthermore, the conduct of the discussions is also different since the discussion topic is not revealed one day in advance but only during the discussions. This is done to avoid the effect of advanced preparation as Arthur (2010) has found that preparation in advance can change the

outcomes of the study. Since previous ESL studies which have compared online and face-to-face discussions have mostly focused on tertiary level learners without taking into account their different personalities and language proficiency (Fitze, 2006; Warschauer, 1996), this study looks at the 16-year-old ESL learners from secondary school with attention paid to their different personalities and language proficiency.

This research hopes to enlighten language instructors on the use of different discussion settings for different types of ESL learners. This study is important as the ESL language instructor should design methods that will take advantage of the student's unique personalities rather than expecting the learners to adapt to the instructor (Moody, 1988 as cited in Arthur, 2010). Even though a good teacher can make a difference to the ESL class by drawing out the introverts and the less proficient learners, this study is more concerned with the role of the medium and the learners. So, the teacher's role is very much reduced in this study and thus her personality and skills are not taken into account. For other limitations of this study, please refer to *Section 1.7: Limitations of Study*.

After identifying the purpose of this research, the following section reveals the research questions of this study.

1.6 Research Questions

To inform the ESL language instructors on the use of different discussion settings (face-to-face and online) for the ESL learners who have different personalities (extroversion vs. introversion) and language proficiency (higher-intermediate vs. lower-intermediate), this research looks at their contribution of words, participation style and

discourse which display lexical complexity and interactive competence. Specifically, this study attempts to seek answers for the research questions as follows:

1: Given the same amount of time for discussions in face-to-face and online settings, how do the contributions of the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) differ?

2: What type of participation style is shown by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) in face-to-face and synchronous online discussions?

3: What is the difference in the lexical complexity displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

4: What is the difference in the interactive competence displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

The following section describes the hypothesis for the research questions.

1.6.1 Statement of Hypothesis

It is predicted that the students may generate more contributions in the online discussions. This is because the online environment allow learners to ponder longer before conveying their intended messages and it is also less threatening since immediate response is not anticipated (Hamat, 2008). The less threatening online environment might suit the introverts and the less proficient learners better and more production of words by them in the online setting is anticipated. The participation of the learners in online discussions could be more balanced too as all the students can respond at the same time in an online setting unlike face-to-face discussions which require turn taking (Simpson, 2005; Smith, 2003).

Greater lexical complexity and interactive competence might also be seen in online discussions as the learners are expected to convey emotions and ideas explicitly in the absence of non-verbal communications such as facial expressions, body language and tone of voice (Fitze, 2006). However, the lexical complexity displayed by the learners may differ between the more proficient and less proficient learners. More proficient learners are predicted to have a wider vocabulary range and thus able to display higher lexical complexity during the discussions. The personality of the learners may not be a big influence to the display of lexical complexity during the discussions but it may affect learners' interactive competence in different discussion settings. The introverts and the less proficient learners are predicted to be 'braver' in showing their interactive competence in the considerably 'safer' online discussions.

The independent variables of this investigation are the mediums of discussions and the ESL learners' characteristics (personality – extroverts or introverts; language

proficiency – higher-intermediate or lower-intermediate). The discussion environments investigated in this study are online and face-to-face settings while the personality of the learners are either extroverts or introverts. The dependent variables in this study refers to the performance of the learners in different discussion settings and that include the learners' participation style and discourse which displays lexical complexity and interactive competence.

The null hypotheses for this study are:

1. There is no significant difference in the number of words contributed by the learners who have different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) in face-to-face and online discussions.
2. There is no significant difference in the participation style of the learners who different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) in face-to-face and online discussions.
3. There is no significant difference in the lexical complexity of the ESL learners who have different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) in face-to-face and online discussions.
4. There is no significant difference in the interactive competence of the ESL learners who have different personality types (introverts and extroverts) and

language proficiency levels (high-intermediate and low-intermediate) in face-to-face and online discussions.

The methodology for this study is briefly explained in the next section. A more detailed description can be found in Chapter 3.

1.6.2 Methodology

This study was carried out in a fully residential science school in Kuala Lumpur. The school offered the same curriculum as the national schools. However, unlike the national schools which were day schools, the fully residential science school required the learners to stay in the hostel provided by the school.

The participants of this study consisted of 48 ESL female learners aged between 16 and 17 years of age. Four sessions of face-to-face and online discussions were carried out over a month. The topics for discussions were consistent with the themes in the curriculum specification of Form 4 English Language. In this study, the face-to-face discussions were held at a meeting room while the online discussions were conducted online at the website *Learning English in an Interactive Way*.

A mixed-method approach was used in this study. Quantitative analysis was carried out based on the experiment and the survey while qualitative analysis was done based on the online feedback session, the learners' comments in the survey and their responses during the experiment (gathered from the transcripts and researcher's observations). The methodological framework of this study is as shown in *Figure 3.5*:

Methodological Framework (Section 3.14: Flow Chart of the Methodological Procedure).

The first stage of this research was to select 24 extroverted and 24 introverted ESL learners using the *Style Analysis Survey: Assessing your own Learning and Working Styles* (Oxford, 1993). Among the 24 extroverts and 24 introverts, 12 or half of them were more proficient and belonged to the high-intermediate group while the other 12 were less proficient and belonged to the low-intermediate group (please refer to *Table 3.1* and *Table 3.2* for the details of the participants). The language proficiency of the learners was gauged from their scores in mid-year examination and school-based oral assessment. Through these tests, the learners' reading, writing, listening and speaking skills were assessed. The four skills were assessed as face-to-face discussions require learners' listening and speaking skills while online discussions involved learners' reading and writing skills. It should also be noted that even though different skills were involved, face-to-face and online discussions were still comparable due to the similarities which have been discussed in *Section 1.2.1 Face-to-face and Online Discussions*.

After briefing all the participants about the research process, the selected participants were divided into 2 groups and they participated in two online discussions and two face-to-face discussions. After gathering the data from the experiment, the videotaped face-to-face discussions were transcribed by the researcher and cross-checked by two selected students who have participated in the experiment (please refer to *Section 3.14: Flow Chart of the Methodological Procedure* for explanation). Next, the data were triangulated using two other instruments: a survey and an online feedback session (please refer to *Section 3.12: Triangulation*). After the data collection process,

the data from the quasi-experiment were analysed using SPSS software and Wordsmith Tools to observe for any relationship between the personality of the participants and their participation style, lexical complexity and interactive competence in face-to-face and online discussions. The participants' interactions during the online and face-to-face discussions as well as their answers in the survey and online feedback session were also analysed to identify the reasons behind their preferences for certain discussion settings.

As with most studies, this study has its limitations and they are explained in the following section.

1.7 Limitations of Study

Since the sample size was relatively small, the findings of this study may not be applicable to the ESL learners in general. Moreover, the participants of this study were limited to the female gender because the experiment was carried out at an all-girls school where the researcher worked at.

Another limitation of this study was the exclusion of the facilitator's personality and skills in the analysis of the research questions. However, it should be noted that the facilitator's personality and skills were not taken into consideration in this research due to the emphasis placed on the role of the medium and the learners.

Apart from that, the researcher was also the teacher of the participants in this study and this may affect the feedback provided by the learners. The learners might try to be more active to impress the teacher. However, as mentioned by Fitze (2006), the same case can also happen even if the researcher was not the participants' teacher. In

discussions whereby the facilitator was not the participants' teacher, the unfamiliar situation might even inhibit the learners and this encouraged the present study to employ the participants' teacher as the researcher and facilitator of the discussions.

In this study, the transcription of face-to-face discussions was also approximate especially with unanimous responses and whispers. In other words, the transcription of face-to-face discussions may not be exactly the same as in the actual situation because the transcription was based on what was heard from the two video cameras and the researcher's notes during observations. Not all the information of the source and the messages can be captured especially when the responses were uttered simultaneously or when the view of the speaker was blocked. Fortunately, the unanimous responses in this study usually consisted of very short phrases such as *yes* and *no*. Thus, the impact on the data analysis of this study was relatively low.

The whispers between members were also ignored in this study because it was quite impossible to identify the words uttered. Thus, this study only focused on the audible messages which were directed to the group rather than to a certain individual who was usually sitting nearby. Nonetheless, the researcher has tried her best to encourage the participants to speak up to the group when she noticed the participants were whispering. Thus, the scenario slowly decreased as the learners became more familiar with the experimental settings of this study.

In this study, the survey was only administered after the learners went through the experiment. This required them to remember and evaluate the discussions which were carried out few weeks ago and thus may contain flawed memories from the

participants. Despite that, such drawbacks afflict most research which relies on human memory (Meyer, 2003).

It should also be noted that only personality types and proficiency levels were considered in this study. Other individual differences such as motivation, aptitude, thinking style and others were not studied.

The definition of terms used this study are explained in the following section.

1.8 Significance of the Study

Through this study, ESL researchers and teachers could gain a better understanding of influence that the learners' individual differences have on their participation style and discourse in different discussion settings. In other words, different discussion settings can obtain different kinds of participation style and discourse from the learners (Fitze, 2006), thus language instructors can utilise the different discussion environments strategically on the learners who have different characteristics to meet the learning objectives more effectively.

Recognising that active involvement with the target language is important in learning a second language, this study examines the contribution of words by the learners with different personality types and language proficiency levels. From the findings, a better idea can be gained on how to elicit more contributions from a particular group of students and to encourage more balanced participation in a class. Encouraging more balanced participation and contributions from students during discussions is crucial. This is because when the participation is balanced, learners can

feel more positive towards the language learning process. Active production of the target language in discussions is also beneficial to the ESL learners as they can receive comprehensible input, negotiate meaning, obtain feedback and modify their output. This is in line with Long's Interaction Hypothesis (1996) which believes that interaction can improve SLA as the negotiation of meaning can increase the learners' comprehension of the input and the received feedback can also enable them to notice linguistic features.

The examination of the learners' lexical complexity and interactive competence in different discussion settings can also enlighten the ESL language researchers and practitioners of the benefits that can be brought about by the medium of discussion. With an understanding of the lexical complexity and interactive competence displayed by learners in different discussion settings, the language instructor can work out ways to increase the learners' vocabulary and communication skills.

Undeniably, both face-to-face and online discussions are valuable tools for teaching and learning (Berge & Collins, 1995). It is important for the language instructors to utilise the medium of discussions in an effective way to promote second language learning. Therefore, this study intends to find out more about the potential benefits of using these different discussion settings to cater for the different ESL learners in achieving different learning outcomes. The findings would hopefully raise awareness of the learners' individual differences and the effect of it on their behaviours in different discussion settings. With a better understanding of the learners and the discussion settings, more effective pedagogical approaches can be designed to improve the second language teaching and learning process. In Chapter 5, the implications and suggestions for SLA theory, research and pedagogy will be explained.

1.9 Definition of Terms

For this study, the definitions and explanation of the key terms are as follows:

1. Online discussions:

The exchange of messages which are held synchronously or asynchronously in written electronic form through the mediation of computers. In this study, the online discussions were held synchronously in a free online forum with the teacher posting a topic for the students to comment.

2. Face-to-face discussions:

Traditional discussions held in a meeting room with the teacher posting a topic for students to share and exchange their views.

3. Extroverts:

Extroverts refer to students who have more interest in socialising with wide range of people and events and prefer interactive learning activities (Oxford, 1993). Extroverted learners typically show traits such as:

- thrive on small talk
- think as they speak
- make new friends easily
- more energetic around people
- interested in and concerned with the outer world
- quite blunt; speak whatever they are thinking
- easily assimilate themselves in a new group
- love to socialise, chat and attend social gatherings

(Naik, 2010)

4. Introverts:

Introverts refer to students who tend to avoid social contacts with unfamiliar people and prefer more independent learning activities (Oxford, 1993). They typically display traits such as:

- abhor small talk
- think before they speak
- more energetic when they are alone
- feel nervous or anxious in a crowded place
- appear to be quiet, deliberate and deep in reflection
- more reserved, have less friends and dislike unexpected visitors
- enjoy introspection, problem solving, and complex thinking
- love to do solitary activities like reading, writing, painting and daydreaming

(Naik, 2010)

5. High-intermediate (language proficiency):

The high-intermediate learners in this study refer to the more proficient ESL students who have scored 27 or 28 out of 30 marks for their oral test (please refer to Appendix 1 for the school-based oral assessment rubric and form) and also a *B+* or *A-* in their mid-year examination (please refer to Appendix 2 for the exam paper).

6. Low-intermediate (language proficiency):

The low-intermediate learners in this study refer to the less proficient ESL learners. Compared to the high-intermediate learners, they have lower scores in the school-based oral assessment and mid-year examination. Their oral test

result ranges from 23 to 26 out of 30 marks and their score for mid-year examination is *C+* or *C*. Please refer to *Section 3.4: Participants* for further explanation of the high-intermediate and low-intermediate learners.

7. Participation style:

The particular way students react when they participate in discussions. In this study, the interest is on whether the participation is balanced or imbalanced among the different groups of learners.

8. Balanced participation:

Balanced participation means students contribute to the discussions equally; not dominated by any students or groups. This is measured based on the learners' contribution of words during the discussions. More information on the way balanced participation is calculated can be found in *Section 3.11.1: Quantitative Method (Data Analysis)*.

9. Lexical complexity:

This refers to the ability of students to show a wide range of topic-related vocabulary. This does not mean the use of difficult words but unique words. Please see *Section 3.11.1: Quantitative Method (Data Analysis)* for details on the ways lexical complexity was determined.

10. Unique words:

Unique words are words which are different (Chafe & Danielewicz, 1987; Cooper, 1990; M. Fitze, personal communication, March 13, 2011). For example, in the sentence "The big bird saw the little bird", there are five unique

words (the, big, bird, saw, little). The words “the” and “bird” are repeated. A word is only considered “unique” the first time it is used.

Please see *Section 3.11.1: Quantitative Method (Data Analysis)* to further understand the use of unique words in answering research question 3 which focuses on the learners’ lexical complexity.

11. Interactive competence:

The ability of students to interact or communicate with others using language functions. The language functions include providing or requesting clarifications, providing response to others without substantiating. (e.g “no”, “maybe”, “I don’t think so”), giving statements for social purposes (e.g. “hello”, “thank you”, “I’m sorry”, “bye”) and meta-communications (e.g. “this topic is interesting”, “please speak louder”, “back to the topic”).

Please see *Section 3.11.1: Quantitative Method (Data Analysis)* to further understand the use of interactive competence in answering research question 4 which focuses on the learners’ interactive competence.

1.10 Conclusion

This chapter has explained the background and the purpose of this study which is related to the interrelationships among the discussion settings, the learners’ individual differences and the learners’ participation style, lexical complexity and interactive competence. The significance of researching CMC is also highlighted due to the undeniable impact of technology towards global communication (Tam, 2009). Since

there are limited studies investigating the influence of personality and language proficiency on the participation style and discourse of Malaysian ESL learners in different discussion settings, it is the hope of this study to contribute significantly to the field of SLA through increased body of knowledge on CMC and CALL technology.

A review of the literature relevant to this study is described in the next chapter, Chapter 2. After this chapter, Chapter 3 will present the methodology used in this study and followed by Chapter 4 which presents and discusses the results and interpretation of the findings. Lastly, Chapter 5 summarises this summary and provides recommendations for future research.

University of Malaya

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter describes the relevant literature review related to the present study. The critical areas which are relevant to the improvement of technology integration in an ESL class are (1) the role of discussions in second language acquisition (SLA), (2) learner-learner discussions, (3) models of the communication process in discussions, (4) the potential of the online discussion setting, (5) the comparison of discussions in face-to-face and online settings and (6) the influence of ESL learners' personality and language proficiency in discussions. The review of methodology and theoretical framework which are associated to this study are also outlined in this chapter. From the review of these areas, this study hopes to find out more about the current body of knowledge related to this study and cultivate significant findings that could lead to more effective integration of technology in ESL classrooms.

2.2 The Role of Discussions in Second Language Acquisition (SLA)

Discussions, whether online or face-to-face, can be effective in establishing cooperative learning and introducing a new topic (Smaldino, Lowther & Russell, 2008). It is found to be more interesting than listening to the teacher's presentation and it also gives students the opportunity to be challenged to think about the topic and share new ideas (Smaldino, Lowther & Russell, 2008). However, not all learners can have a

chance to talk. Participation may be limited by teacher's talk or discussion settings (Fitze, 2006).

Discussion is one of the main elements for successful teaching and learning (Pollock & Squire, 2001). Its importance as a learning strategy is widely acknowledged (Ellis & Calvo, 2004; Hung, Tan & Chen, 2005). Discussions can serve three important roles for participants: to ask for information, clarify matters and share information (Stapa, 2007). Discussions are also a form of social practice which is believed to be an essential part of learning since the presence of humans means having to engage in all sorts of different pursuits which require interactions and for humans to learn from the social practices (Lave & Wenger, 1991; Whitworth, 2009). The exchange of ideas or communication that takes place during discussions can promote second language learning. This is supported by theories such as Krashen's input hypothesis (1985), Swain's comprehensible output hypothesis (1995) and Long's Interaction Hypothesis (1996). These theories explain how discussions can play an important role in second language learning through the hypothesis of how a second language is acquired.

With regard to Krashen's input hypothesis (1981, 1996), Krashen claims that language can be acquired by receiving input at $i + 1$ whereby i is the existing proficiency level while $+1$ is the language just beyond the current level. Since every learner is an individual who acquires linguistic competence at different pace, Krashen (1996) suggests natural communicative input in the design of a curriculum to ensure that each learner can obtain $i + 1$ input. Discussion is one of the language learning activities that can be included in an ESL class as it contains natural communicative input.

In the affective hypothesis, Krashen (1987) argues that comprehensible input will not lead to language acquisition if the input is filtered out before reaching the learner's language acquisition device (LAD) in the brain. The filtering or "mental block" may happen when the learner is anxious, stressed, and has low self-confidence or low motivation (Krashen, 1987). Learners who have a low affective filter are believed to be better in learning a second language as they are more motivated, less embarrassed to make mistakes and tend to interact more with others to acquire more comprehensible input (Krashen, 1987).

Emphasising the idea of comprehensible input at level $i + 1$, Krashen (1994) has argued that one-way comprehensible input is the only requirement for one to acquire a second language. However, Swain (1995) does not find Krashen's idea of comprehensible input to work for her students and believes that comprehensible output is also important in the learning of a second language. She asserts that output can help learners to enhance fluency, notice the gaps in their linguistic knowledge, afford learners the opportunities to try new or unfamiliar language forms and structures and receive feedback from others about their use of language. In other words, comprehensible output enables learners to convey messages with some challenges in producing the second language as they notice their linguistic problem from the feedback of the listener. Noticing a problem 'pushes' the learner to revise his or her output and consequently may be led into "a more syntactic processing mode than might occur in comprehension" (Swain & Lapkin, 1995, p.2b).

Following that, Lightbrown and Spada (2008), Long (1985), Pica (1994) and others postulate the interactionist view of second language acquisition which recognises the role of two-way interactions. They believe the importance of learners being given

the chance to negotiate for meaning through clarification in meaningful activities. Discussion is one of the meaningful activities that can enable learners to work together to negotiate meaning for mutual understanding by modifying and restructuring the discourse when difficulties in comprehending message occurs (Pica, 1994). Modification and restructuring include simplifying linguistics, repeating, clarifying and doing conformation checks (Ariza & Hancock, 2003). According to Long's Interaction Hypothesis (1996), when learners negotiate meaning, the learners' comprehension of the input increases and they usually take cognizance of salient linguistic features. This is deemed beneficial to the learning of a second language.

Generally, discussions which encourage two-way interactions entail "comprehensible input" which enables one to understand the message and "output" which enables one to express and negotiate meaning (Krashen, 1985; Long, 1996; Swain, 1995). The input and output produced during interactions provide learners with the opportunities to be exposed to the target language and practise what they have learned about the language. Discussions can thus enhance second language learning and fluency (Ariza & Hancock, 2003) especially when the situation encourages low filter or less anxiety among the learners (Krashen, 1981).

The next section explores the discussions among ESL learners.

2.3 Learner-Learner Discussions in Second Language Learning

Discussions in an ESL class are usually led and dominated by teachers (Sullivan & Pratt, 1996; Warschauer, 1997; Williams, 2001). This is hardly encouraging learners

to practise using the target language and the current move now is for learners to play the central role in discussions and language teachers to be the facilitators (Brown, 2003).

In the attempt to encourage learners to play a more active role in class discussions, learner-learner discussions are encouraged. Learner-learner discussions refer to interactions between or among learners in pairs or in groups (Moore & Kearsley, 1996). Peer interaction has been analysed and found to be effective in affording L2 learning (Kasper, 2001). There are a number of benefits in promoting learner-learner discussions. Firstly, learner-learner discussions create a community of peers and create opportunities for collaboration, scaffolding and social construction of meaning (Rovai, 2001). In addition, learner-learner interaction could make learners more satisfied and interact more frequently (Gunawardena & Zittle, 1997). With more production from learners, learners' attitude and achievement would also become more positive (Sherman & Klein, 1995). Based on this premise, ESL classes should be designed to promote interactions among learners.

It is also interesting to note that younger learners are found to perceive learner-learner discussions as more motivating and stimulating than the advanced adult learners (Moore & Kearsley, 1996). This further supports the use of learner-learner discussions on the sample in this study which consists of younger teenage learners with considerably lower language proficiency than the advanced adult learners.

Noting the importance of discussions in second language learning, this research intends to investigate how the potential of discussion as a learning platform can be maximised in a second language classroom. Before that, the communication process that occurs in discussions need to be understood so that the discussions can be

facilitated more effectively. The models of the communication process are described in the following section.

2.4 Models of the Communication Process in Discussions

Differences between a discussion carried out in face-to-face and online can be better understood through the analysis of numerous communication models such as (1) the simplest model, (2) Shannon's Information Theory Model, (3) the intermediary model (gatekeeper/two-step flow model), (4) the interactive or cybernetic model, (5) the transactional model and (6) Foulger's Ecological Model of Communication (2004). These models explain the process of communication and the factors that can instigate successful discussions.

2.4.1 The Simplest Model

As the name suggests, the simplest model is simply showing a sender sending a message through a selected channel to a receiver (Jurin, Roush & Danter, 2010). This model only addresses one-way communication. Thus, it is not sufficient to explain the complex communication process that happens in the real world.

The next section explains the intermediary model of communication which enlightens the readers on the gatekeeper(s) who can complicate the communication process in the real world.

2.4.2 Intermediary Model of Communication

The intermediary model of communication comprises of an intermediary or gatekeeper who possess the ability to choose, decide and even change what messages to be received by the audience (Katz, 1957). The examples of people holding an intermediary role are the editors or reviewers who choose articles to be included in a newspaper, journal or magazine or the moderators in online discussions. This model informs this study that the moderators in online discussions can play a major role in controlling the content shown but it is considerably harder for the facilitators in face-to-face discussions to control the visibility of the messages. Despite that, this model is not relevant for the present study as the moderator of the online discussions did not control the messages produced by the participants. This was done to maintain consistency in the facilitation methods for both face-to-face and online discussions.



Figure 2.1: An Intermediary Model

The same with the simplest model, the intermediary model of communication has ignored the dynamic two-way communication. Thus, the next section explores Shannon's *Information Theory Model* (1948) which explains the communication process that usually happens two-way.

2.4.3 Shannon's Information Theory Model (The Active Model)

Shannon's (1948) model of the communication process does not only explain the way communications happens but also the reasons why communication is sometimes ineffective.

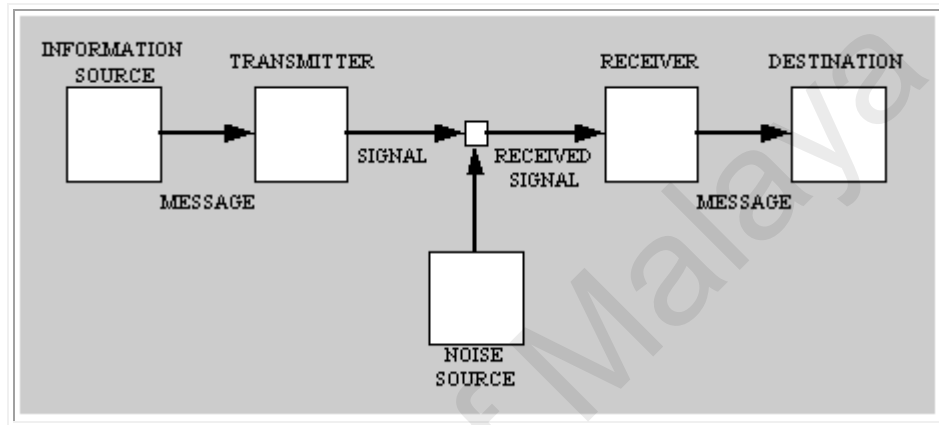


Figure 2.2: Shannon's (1948) Model of the Communication Process

As shown in Figure 2.2, Shannon's model of the communication process illustrates the flow of the message or information from a source to a destination by passing through a channel. This model comprises of eight components:

1. **Information source** from a person creating the message
2. **Message** sent by the information source to be received by the receiver
3. A **transmitter** which transforms a message into a signal. It can be the mouth and body for face-to-face communication. Other examples of transmitters include telephone, television, computer and etc.
4. The **signal** flowing through a channel.
5. A **channel** is shown as a small unlabelled box in the middle of Shannon's model.

Through a channel, the signal can be transmitted from one person to another. In face-to-face communication, a channel is built of the air to create sound and the

light to show one's gesture. Other popular channels include electricity, paper, postal system and radio waves.

6. **Noise** is a secondary signal which confuses the signal from the information source within a channel. The solution by Shannon to minimise the effect of noise is through correction of the detected error. Nowadays, noise has a broader meaning for problems linked to effective listening and interference which distorts original message.
7. A **receiver** converts the signal back as a message. For instance, a telephone, television or computer used to receive information or ears and eyes to receive information in the form of sound and gestures in face-to-face interaction.
8. A **destination** refers to the person or entity who receives and processes the message.

Shannon's model of the communication process is a useful abstraction which has identified the essential components of communication and the relationship among them. However, it has not successfully shown the complexity of the real-world communication process (Foulger, 2004). Communication in the real world is more complex with messages, transmitters, signals, channels and receivers often layered serially and in parallel causing multiple signals to be transmitted and received. Furthermore, the communication in the real world is rarely direct and unidirectional as portrayed by the model. This model is thus incomplete and may be more applicable to telephone and telegraph rather than to other media. Shannon's model is also argued as not a model of communication process but more of "a model of the flow of information through a medium" (Foulger, 2004).

Thus, the following sections continue to look for the most suitable model to explain the discussion process. The next section explains the interactive model of communication which is an improved adaptation of Shannon's *Information Theory Model*.

2.4.4 The Interactive Model (The Cybernetic Model)

The elaboration of Shannon's model which includes the two-way communication process is shown in the interactive model and the transactional model. The interactive model, as shown in Figure 2.3, added the cybernetic concept of feedback on the received messages from the destinations so that the sender of information source can adapt their messages (Weiner, 1948, 1986). Feedback here refers to message(s) and the feedback can be an information source which is transmitted and received by a destination, going through the process as shown in Shannon's model. With the inclusion of feedback in the interactive model, the destination can convert into the information source and the source can turn into destination.

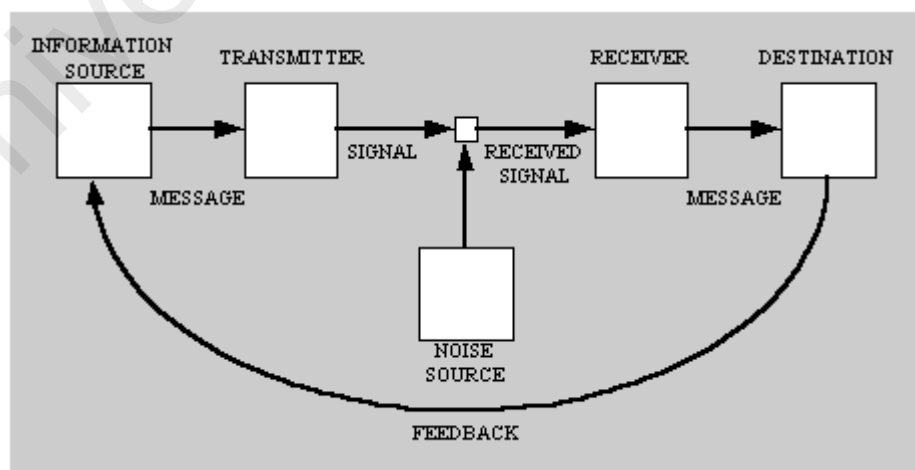


Figure 2.3: An Interactive Model

Feedback is an important element in the communication process that can enhance learners' ability to notice their linguistic gap and work on it (Swain, 1995). However, even though the important component of feedback has been added to the interactive model, it is still inadequate in explaining the communication process that occurs during discussions. There are still many other factors that need to be included. For example, the medium and the individual differences of the people involved can affect the communication process.

The next section looks at the transactional model of communication which is also an adaptation of Shannon's *Information Theory Model* (1948).

2.4.5 The Transactional Model of Communication

The transactional model of communication is deemed brilliant in portraying the two-way face-to-face communication process (Foulger, 2004). This model has introduced us the idea of communication which is not limited to the traditional face-to-face environments but can also be extended to other interactive mediums such as e-mail, radio and letters (Foulger, 2004). The important role played by language and feedback is also highlighted in the explanation of the two-way communication.

However, instead of labelling the creators and consumers of the messages, the transactional model of communication labels the people involved as communicators who create and receive messages. This model implies both the communicators to be equal which is often not the case even in interpersonal context. In reality, the sender of the message has the advantages of choosing the message and the medium, allocate the bandwidth of a message, set the tone and rules of interaction and frame meaning.

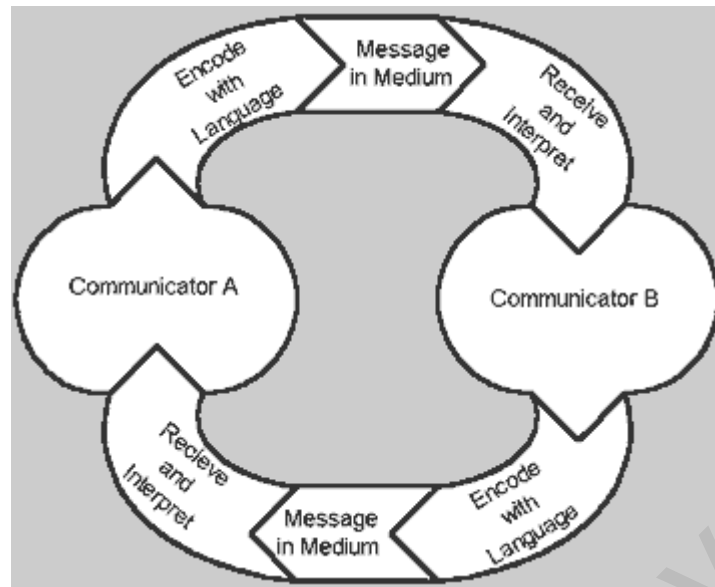


Figure 2.4: A Transactional Model

A more comprehensive model of communication process is still needed and Foulger (2004) has attempted to create one with the ecological model of communication. The next section describes the model.

2.4.6 The Ecological Model of Communication

Communication models such as intermediary, interactive and transactional are found to be inadequate in explaining the dynamics of two-way communication. In these models, the receivers of the messages are assumed to automatically consume the messages. However, the receivers usually have the choice to listen to or read what they want among the many potential messages that they receive. These models have also ignored the noise which is within the consumer of the messages, the impact of culture and the selective attention they have. The perception the others have on a person and the perception of the person towards himself or herself as well as his or her relationship with the others can affect whether the messages are willingly consumed and the way they are interpreted. This again has not been explored by the models discussed above. In

addition, the language aspect such as spoken, written, and non-verbal languages are ignored in these models (Foulger, 2004). Furthermore, the relationship between a medium and the language, message or the people taking the role of creating or consuming messages has also not been investigated.

After more than forty years since the 1960s, Foulger has looked into the limitations as noted above of the previous models and updated the communication model to fit in the evolution of communication and the new media. *The Ecological Model of the Communication Process* as shown in Figure 2.5 has four essential constituents: messages, languages, media and the people acting as creators or consumers of messages. This model shows that communication happens between the creators and consumers through the mediation of messages which are composed using language within media and then received through media and deciphered with the use of language.

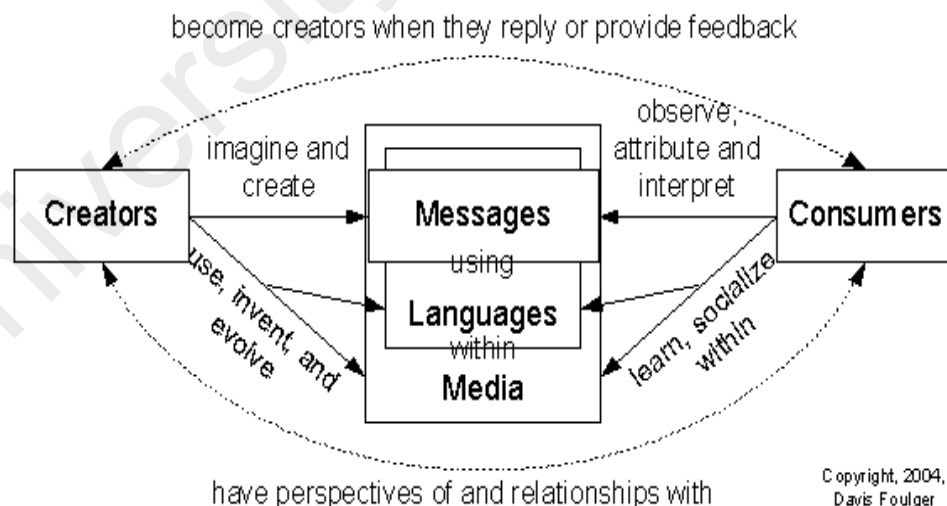


Figure 2.5: The Ecological Model of the Communication Process

Foulger's (2004) *Ecological Model of the Communication Process* has given a comprehensive view of the communication between human beings in the natural state and the man-made information-loaded world (Jurin, Roush and Danter, 2010). In this model, it has shown that communication requires creators, consumers and their socially-constructed messages. The movement of messages from the creators to consumers involves language and media. As Foulger (2004) has noted, languages and media evolve and thus specified skill is needed to use the evolved languages and media. Human beings must learn the target language and media so that they can create and understand the messages. In other words, one must know how to use the language and media for interaction purposes. The relationship between creators and consumers are "dynamic, cyclical and multifaceted as meanings are moulded, traded and reacted to" (Jurin, Roush & Danter, 2010, p.18).

Accompanying Foulger's (2004) *Ecological Model of the Communication Process* is a set of propositions which tries to explain the interaction of the fundamental and complex constituents that enable communication. The propositions are included in Table 2.1.

Table 2.1: Propositions for the Ecological Model of the Communication Process

- 1) Proposition 1: All communication is mediated.
- 2) Proposition 2: Communication is mediated by three separate but interrelated constructs: (1) the message, (2) the languages that the message is encoded in, and (3) the medium or media in which the encoded message is transmitted, stored, and/or processed.
- 3) Proposition 3: When engaged in the process of communication, people act in two distinct roles: creator and consumer. The creation role is associated with the instantiation of representations of meaning. The consumption role is associated with the interpretation of representations of meaning. Each role has a different relationship to communication, even when both roles are concurrently associated with the same person.

Proposition 3.1: Neither the act of creating a message nor the act of consuming a message necessarily ensure that communication (e.g. the interpretation of represented meaning) will occur. One cannot communicate.

4) Proposition 4: Communication is instantiated in messages.

Proposition 4.1: Communication is instantiated using languages and media.

Proposition 4.2: Messages are an approximation of the meaning a creator of messages intends.

Proposition 4.3: Interpretation of the messages consumed from a medium is approximate.

5) Proposition 5: Messages are instantiated using language and media.

Proposition 5.1: Language shapes the possibilities associated with a message.

Proposition 5.2: The medium shapes the possibilities associated with a message.

6) Proposition 6: People must learn language and media in order to be able to create and interpret messages.

7) Proposition 7: People create (e.g. invent and evolve) languages and media.

8) Proposition 8: Languages are instantiated using media. Every medium entails a set of possibilities for language that shapes what languages are used.

9) Proposition 9: Consumption of messages allows consumers to form perceptions of and even establish (at least in their own minds) relationships with the creators of messages.

Messages are the main focus of Foulger's (2004) *Ecological Model of the Communication Process* as they are the main product of the interaction among people, language and media. A message is complex. It is usually an incomplete part of a construction developed by the creator for the consumer in a medium with language(s) that can be understood by the consumer. In other words, messages are enabled by language and media.

The important roles played by media and language in influencing the messages produced are clearly explained in Foulger's (2004) *Ecological Model of the Communication Process*. However, the model has not included a few other factors that

could influence the communication process. They include the external and internal noises, the culture and the perception of the receivers as well as the individual differences such as personality and language proficiency. These aspects could be added to make Foulger's (2004) *Ecological Model of the Communication Process* more comprehensive.

Despite that, Foulger's (2004) *Ecological Model of the Communication Process* has given a good illustration of the communication process. The model has aptly described the communication process with a focus on the media, language, messages and the people involved. Since the present study investigates the effect of different media on the use of language by different learners, Foulger's (2004) *Ecological Model of the Communication Process* comes in handy in guiding the present study. Thus, this model is also selected to be the theoretical framework of this study (please refer to *Section 3.2: Theoretical Framework*).

All in all, the communication models have shown the ESL teachers and researchers the complex process involved during discussions. To enable learners to interact effectively in a discussion using English language, ESL instructors need to be aware of the potential stumbling blocks during the communication process and be prepared for it. In addition, knowing the process of communication can also help language instructors to gain more useful insights to the involved components and use it more effectively in an ESL class. For instance, a medium is a crucial component during communication and thus language instructors need to be aware of the potential of different discussion settings for discussions to be carried out effectively.

The next section explores the potential of online discussion forum as a medium for discussions among the ESL learners.

2.5 The Potential of the Online Discussion Setting

An online discussion setting has been argued to be especially useful for adult learners who have to cope with full-time work while furthering their studies due to great flexibility in time and location that it offers (Peterson & Bond, 2004; Hara, Bonk & Angeli, 2000). Thus, online discussions are always associated with distance education. But now, computer-mediated communication (CMC) has developed rapidly and is playing a bigger role in 'traditional' classroom settings in promoting knowledge construction, learning autonomy and critical thinking (Lim & Chai, 2004; Marra, Moore & Klimczak, 2004).

CMC is believed to be beneficial for ESL learners if well-designed (Ariza & Hancock, 2003; Blake, 2000; Chen, 2005; Savenye, 2005; Warschauer, 1998). It has been widely used to assist instructions in class and has promoted "paradigmatic shifts in teaching and learning" in which traditional instructor-centred education is directed to learner-centred learning and classes can utilise a wider range of interactive methodologies (Berge & Collins, 1995, p.2). This "can improve the quality, quantity and patterns of communication" in ESL learners (Berge & Collins, 1995, p.2). Teachers who have incorporated the use of CMC in K-12 classrooms have also found it to be able to bring excitement and solid learning experiences to the learners especially when they can connect with others around the world (Fowler & Wheeler, 1995). In addition, many teachers found their students to be more cooperative and their social interaction improved when group activities were carried out using CMC.

Warschauer (1998) asserts that CMC is less threatening compared to face-to-face interaction and can thus foster risk taking. More balanced participation among learners can also be promoted in this relatively 'safer' environment (Warschauer, 1998). In addition, people with disabilities, speech impediments, physical impairment or disfigurement can also be better empowered in CMC than the face-to-face environment which hampers equal participation (Berge & Collins, 1995). More balanced participation among users can also be enhanced in the less threatening online environment as it is primarily text-based and thus social cues such as the person's rank, status and social roles are reduced (Berge & Collins, 1995). Furthermore, the time that one spends to compose the message is unknown and the message is judged more on the ideas conveyed rather than the author (Berge & Collins, 1995). Apart from that, ESL learners can produce output at their own pace and look at their own texts which can be studied later (Lamy & Goodfellow, 1999; Warschauer, 1998). This is because CMC does not require members to take turns to send their messages across. Instead, multiple threads can run concurrently and thus the order of the messages may not follow the sequence of the interaction as in face-to-face communication (Yates, 2001).

CMC also allows learners to engage further and deeper with the target language and the speakers as they have more opportunities to meet with the interlocutors online and form friendships that may develop learners' communicative competence and cultural awareness (Whitworth, 2009). The online discussion forum is one of the CMC tools that this research is interested in especially since ESL learners have shown a positive attitude towards the use of online discussion forums for learning purposes (Son, 2002). Similar with most other CMC tools, an online discussion forum is heavily text-based and can be a space for one to acquire information (Lueg, 2001; Montero, Watts & García Carbonell, 2007; Whitworth, 2009). Many students are also found to be satisfied

with the use of CMC as they are able to control the pace of their learning (Pederson, 1987).

In an online discussion forum, learner-learner collaboration is promoted as the learners can produce joint knowledge by making decisions together and taking actions together (Whitworth, 2009). By reading about other participants' experience, the other members can also learn from what has been shared and expose themselves to the target language in the meantime (Whitworth, 2009). Hence, Whitworth (2009) believes that a discussion forum can be effective for language learning as learners engage in the discourse on a topic of shared interest. A discussion forum is thus deemed to be effective as a language learning tool even though there are less contextual cues compared to the traditional face-to-face communication (Whitworth, 2009).

The communication produced in an online discussion forum can also facilitate learners to acquire a second language through the development of relationships with other members of the society and participation in real social contexts (Sutherland, Lindström & Lahn, 2003; García-Carbonell, Watts & Montero, 2004). *Apart from that*, learners can also learn to identify and resolve problems related to their studies and work by participating in topic-oriented discussion forums. This can stimulate learners to acquire the linguistic and communicative skills needed for specific purposes and also related contents (Sutherland et al., 2003). According to Nuttall (1996), ESL learners can learn the language better when there is integration of some content knowledge or current issues.

In addition, ESL learners can also develop their pragmatics through online discussion forums by reading and observing the online pragmatics conventions used by

other participants such as chat language and the style for greeting, presenting oneself and taking leave (Whitworth, 2009). This can help learners to feel more comfortable with their use of the second language (Whitworth, 2009). Since online discussion forums are often archived and ordered by date, learners can also read previous postings and this gives learners the idea of appropriate contributions (Whitworth, 2009). Referring to previous postings is important for learners who have less experience in online discussion forums as the context can enable them to be more familiar with the rules and regulations to avoid insults, attacks or reprimands (Whitworth, 2009). With the use of online discussion forums, language instructors can help learners to be more independent and assertive in their language learning process (Whitworth, 2009). However, both the language instructors and learners need to observe the rules in online discussion forums to create a supportive and motivating environment in online discussion forums (Whitworth, 2009).

Even though an online discussion forum has great potential in assisting ESL learners to learn English language, the use of it still needs to be implemented carefully as not all learners are able to express themselves well in writing (Berge & Collins, 1995; Muilenburg & Berge; Najla, 2008). Even for the learners who are able to, the act of writing and using online text-based applications can be a struggle and time-consuming (Berge & Collins, 1995). Furthermore, computers are not always reliable and may cause more inconvenience and waste of time (Berge & Collins, 1995).

Apart from that, miscommunication and negative encounters such as public inflammatory and aggressiveness can also occur in the online discussion forums (Berge & Collins, 1995; Whitworth, 2009). This is because social cues are reduced and “non-reticent personalities can be encouraged to become overly zealous” in the participants’

responses (Berge & Collins, 1995, p.4). As a result, learners may be discouraged from staying in the discussions (Berge & Collins, 1995; Whitworth, 2009). Moreover, the learners' messages in online discussion forums are sometimes ignored or censored by the moderator and this would also impact on the cooperation among learners and their motivation to continue with the discussions (Whitworth, 2009).

Studies also suggest that interactions among learners may not happen voluntarily in online discussions (An, Shin & Lim, 2009). "Lurkers" who may never involve in the online discussions are quite often found (Benfield, 2000). The study by Khine et al. (2003) has also found that the participants do not seem to have the habit of actively interacting in the computer-mediated setting and do not read and respond to others' messages unless they are required to provide feedback. Likewise, many learners are too shy to post their comments or replies and are not used to critiquing (Moore, 2002; Muilenburg & Berge, 2005). Looking at these circumstances, requiring constructive feedback to peers' postings from students might be needed to facilitate asynchronous communication (An, 2009). This strategy can help learners to better understand the other learners' view and also increase their motivation and eventually create meaningful interaction (Shin & Cho, 2003). Learners would not feel that their ideas were "ignored" and lose interest in the activity (Shin & Cho, 2003). Still, instructors need to be aware that students might also lose interest in finding or loading the discussion forum and the reading might also be too much for them.

Also, not all learners favour online discussion since the messages are usually not in serial and vital conversation practices such as turn taking and overlap are lost (Khine, Yeap & Lok, 2003). Some learners are found to prefer the social aspects of the traditional face-to-face environment in a classroom and the charismatic presentation of

their language instructors (Berge & Collins, 1995; Pollock & Squire, 2001). Sense of isolation may be felt by the learners and language instructors using online discussion forums due to the lack of social cues which can be easily found in face-to-face interaction (Berge & Collins, 1995). Apart from that, many researchers also worry that CMC may be addictive and can interrupt face-to-face relationships (Berge & Collins, 1995). Fowler and Wheeler (1995) have also noted the many requirements that are needed for online discussion forums to be used successfully which include the well-functioning of computer equipment, technical support, software, network access and the time needed to learn to use the equipment. So, though online discussion forums can be a useful and effective tool for second language teaching and learning (Whitworth, 2009), there are many things that need to be considered carefully when implementing the use of it in an ESL class.

Though online discussion has its limitations, it is still a beneficial tool for improving the teaching and learning process (Berge & Collins, 1995). Language instructors are thus urged to use it responsibly which means using it in addition to other tools rather than using it as a replacement (Berge & Collins, 1995). For more effective collaborative learning in an online environment, language instructors should also play the role of facilitators rather than directors (Fowler & Wheeler, 1995). Since the online discussion forum and its discourse type and structure are still relatively novel (Whitworth, 2009) researchers are urged to pay more attention to this area.

The following sections look at the type of online discussion used for this study.

2.5.1 Synchronous Online Discussion

Two types of discussions can occur in a computer-network-based online setting: asynchronous discussions and synchronous discussions (Al-Shalchi, 2009; Wang & Woo, 2007). Both can be easily accessed by participants from anywhere in an online environment and the discussion can also be easily archived and referred to (Al-Shalchi, 2009). Asynchronous discussions refer to discussions which learners can participate at any time while synchronous discussions refer to discussions which require the participants to meet at the same time to communicate by reading, typing and sending messages (Benson, 2003; Lapadat, 2002; Yates, 2001).

Since the focus of this research is on comparing online and face-to-face discussions, synchronous online discussions will be used in this study as it is more similar to face-to-face discussions with both happening in real time. The members of the discussion group can also meet at the same time to work collaboratively and receive instant feedback (Al-Shalchi, 2009). Moreover, like in face-to-face discussions, the interactions in synchronous online discussions usually consist of short single-lines messages (Yates, 2001). Nunan (1999) who has analysed the transcripts of synchronous online interactions also finds the discourse of synchronous online discussions to be similar to face-to-face communication.

Apart from that, Nunan (1995) also finds the use of synchronous online discussion to be beneficial as it is student-centred and the participants are also more constructive and cooperative. The synchronous online discussion is also a useful tool in an ESL class as it can enhance the process of noticing and encourage more successful uptakes in language-related episodes which could lead to subsequent learning of the target language (Sotillo, 2009; Shekary & Tahririan, 2006). In addition, learners are also

found to prefer synchronous online discussions because of its ability to speed up the interaction process and improve the quality of collaboration among learners (Chen & Wang, 2009). However, even though the pace of interaction in synchronous discussion is faster than asynchronous discussions, perceptible delay between messages is still expected (Benson, 2003).

The downside of the synchronous online discussions is that the participants need to be quick in reading, composing and sending messages in order to be involved in the discussions (Lapadat, 2002). Since it is slower to type than to speak, online users are often found to speed up their typing by writing in two lines or less and use short forms such as “gtg” for “got to go” (Lapadat, 2002). The conventions of grammar, spelling and punctuation are usually less formal (Lapadat, 2002). Typically, the real-time synchronous discussions are brief, rapid, informal, socially oriented, superficial and ambiguous (Lapadat, 2002). Ambiguity may also occur due to the brevity of the messages and the less standard conventions of writing, the slow typing speed and also the possible discursive coherence caused by simultaneous messages being posted together (Lapadat, 2002). In online discussion, learners also tend to drift between topics, trail off or move to private sessions (Lapadat, 2002). Thus, Murphy and Collins (1997) caution the language instructors that synchronous online discussions may be challenging for ESL learners and poor typists although some ESL learners do prefer typing to speaking English (Jones et al., 2001).

The other limitation of synchronous online discussion is that the content is usually less substantive and there is less room for reflection compared to asynchronous online discussion (Lapadat, 2002). Thus, synchronous online discussion is deemed to be more appropriate for brainstorming, rapid problem-solving, prepared questions and

answer sessions, interactive and exploratory discussions (Haythornthwaite, Kazmer, Robins, & Shoemaker, 2000; Keller, 2000; Lapadat, 2002).

When synchronous online discussions are conducted in the instant messaging channels, the messages appear in a linear chronological order rather than topical as in asynchronous discussions. However, as Jones et al. (2001) explain, the conception of synchronous discussions may be too narrow. Most researchers have studied synchronous discussions based on instant messaging channels such as chat rooms, chat lines and instant messaging systems such as *ICQ* and *Internet Relay Chat (IRC)* which are widely used to create social presence and connect to peers (Jones, 2002; Rintel, Mulholland & Pittam, 2001). Thus, the attempt to conceptualise online discussions as a content-oriented discussion tool could be at odds with the way learners actually perceive and use the medium.

Since interactions in chat rooms and chat messaging systems are linked to informal social chat, this research uses the threaded discussion forum in a synchronous manner as a change so that the participants would treat the setting as a platform to discuss issues rather than to chit chat. In addition, the threaded discussion forum is chosen because of the clear layout and ease of tracing and quoting. This is unlike the chat messaging systems in which the discussions can be chaotic when the new messages pop out and participants are immediately led to the latest message even though they are still reading a previous message halfway. When carried out with a large group of participants, this situation can be worse as the participant needs to scroll up and down frequently when new messages pop out at a faster rate and it will take a long time to finish reading a message. The notification of new messages can also be irritating when it is too frequent and thus a threaded discussion forum is used in a synchronous manner

in this study. Moreover, participants have been found to use asynchronous English language discussion forums synchronously (Herring, 1999).

More importantly, a discussion forum is used in the study as Abraham and Williams (2009b) has aptly described discussion forums to be:

... discursively and interactionally versatile communication environments. Participants can incorporate all the same rhetorical, pragmatic, syntactic, and grammatical devices that are used in both spoken and written discourse, and at the same time, this CMC environment can be shaped as more or less synchronous or asynchronous (p.323).

Since synchronous online discussions have always been compared to face-to-face discussions, the following section describes the current literature that has compared face-to-face and online discussion settings.

2.6 The Comparison of Discussions in Face-to-Face and Online Settings

Synchronous online discussions and face-to-face discussions are compared in this study because they happen at real time and are interactive, personalised, relatively informal and offer instant feedback (Lapadat, 2002; Nunan, 1999; Yates, 2001). The discourse produced is also similar as they consist of speech acts, discourse markers, feedback tokens, repairs and many short single-lines messages (Al-Shalchi, 2009; Tudini, 2002; 2003, Yates, 1996; 2001). In addition, the discourse of synchronous CMC can also stress a word by bolding or italicising it (Tam, 2009). However, the discourse of CMC also resembles the written discourse in terms of lexical density, permanent record of exchanges, lack of intonation and use of punctuation and textual formatting. Despite that, we should note that CMC language in online discussions is ‘neither simply speech-like nor simply written-like’ (Yates, 1996, p.46). It is “a new variety of

language” which is in need of more research (Collot & Belmore, 1996; Paramskas, 1999 as cited in Harrington & Levy, 2001).

One of the most obvious differences between synchronous online and face-to-face discussions is that the members in online discussions appear silent and busy typing on the keyboard while the participants in face-to-face discussions chatter away noisily and laugh (Chen & Wang, 2009). In traditional classes where face-to-face discussions are often held, not every member has the chance to respond as the linear face-to-face discussions only allow a speaker to contribute at a time (Benson, 2003). In contrast, all learners can have the opportunity to answer in the open-access online discussions and they can voice their ideas at the same time (Lapadat, 2002).

In online discussions, the learners can also contribute as much as they would like to in the provided time frame and thus there is greater incorporation of participants’ comments (Lapadat, 2002). Thus, more interaction can occur in online discussions than in traditional face-to-face discussions (Maurino, 2006). Since synchronous online discussions are in written form, the learners can also take a longer time to draft than in face-to-face discussions (Lapadat, 2002). In other words, the online environment can considerably extend the opportunities for learners to communicate at their own pace.

Apart from that, the interactions in an online environment occur in writing and can be automatically saved. This yields permanent record and allows learners to look back at the conversations at their leisure for as many times as they wish (Lapadat, 2002). This encourages learners to reflect and draft their messages (Lapadat, 2002). Even though learners in face-to-face discussions can also recall the discussion content, but it is usually the general ideas and specific wordings are usually forgotten (Lapadat, 2002).

Since online discussions are in written form, it is also more formal and concise than face-face discussions (Lapadat, 2002).

Compared to face-to-face discussions, online discussions are also found to be more task-oriented and focused on the topic rather than trivial matters (Walther, 1996). However, it is often more difficult for learners to arrive at a consensus in online discussions (DeSanctis & Monge, 1998; Walther, 1996). This may be because the participants tend to be more reflective and critical in online discussion due to the convenience in time and space.

Tiene (2000) reports four key differences between face-to-face and asynchronous online discussions. These differences are also applicable to the synchronous online discussions. They are access, timing, mode of expression and visual cues. According to Tiene (2000), more access problems are found in online discussions than in face-to-face discussions because the online environment requires more technical parts like internet access, computers, discussion forums and etc. Online discussions also have a higher probability in facing problems with the proper functioning of equipment and faculty technical component. Nonetheless, the access problem in online discussions may not be as critical with the development of technology.

In online discussions, longer time is usually required to process information as more time is needed for reading, reflecting, preparing responses and typing the messages. Longer duration is also to be expected in asynchronous online discussions compared to synchronous online discussions since members may log in to the discussions at different times (Meyer, 2003). Due to the delayed feature of asynchronous online discussion, prompt responses are less likely to be received from

participants. However, participants in online discussion can have more time to reflect, clarify and respond. They also have the chance to refer to other internet resources for references. However, in face-to-face discussions, the learners have to be well prepared to meet the expectation of giving immediate response. Despite the differences, learners perceive both online and face-to-face discussions to be helpful for clarification.

With regard to the mode of expression as noted in Tiene's study (2000), responses in text-based online discussions are expressed in written forms and this may not be favourable to the participants who are more vocal. Furthermore, the text cannot show "the nuances of the human voice, which can convey the tone of the conversation" (Tiene, 2000, p.373). In online discussions, visual cues are basically absent (Wang & Woo, 2007). Although emoticons can be used to show facial expression or body language, they are not the same as the real ones and are thus inadequate in displaying actual human expressions (Wang & Woo, 2007). Despite this, the online environment is not entirely inferior to the face-to-face discussion setting (Tiene, 2000). Moreover, it should be noted that Tiene's (2000) study has not created an equal environment for both online and face-to-face discussions. Apart from that, it would also be better if the group dynamics and learning styles of the learners have been provided to make the findings of the differences between online and face-to-face discussions more convincing and informative. These limitations in Tiene's (2000) study will be addressed in the present study in Chapters 3 and 4.

In a similar research comparing online and face-to-face discussions, Wang and Woo (2007) analyse the perception of learners towards asynchronous online discussions and face-to-face discussions in a classroom setting by studying the learners' reflections.

The main differences found between online and face-to-face discussions are the atmosphere, response, efficiency, interactivity and communication.

With regard to the atmosphere, Wang and Woo (2007) believe that online discussions can offer a better environment for the learners to discuss issues. This is because the online discussion is deemed to be less hostile, more relaxed, and can provide a more equal opportunity for all to share their opinions (Warschauer, 1996). Thus, the environment may be more suitable for groups composed of different characteristics such as introversion and extroversion, dominance and submissiveness. However, face-to-face discussions are more real and authentic as the participants can communicate in real time and observe the body language and facial expressions of others. Matters can also be clarified immediately. Among the five themes identified in Wang and Woo (2007), atmosphere is also the only theme which has positive score for online discussions.

Response and efficiency are the other two themes identified by Wang and Woo (2007). They claim that face-to-face discussions are more efficient than online discussions because face-to-face setting enables prompt response and requires less time compared to the asynchronous online discussions which need longer time to process the postings and compose their messages in written form (Jonassen & Kwon, 2001; Meyer, 2003). Furthermore, not all will join and contribute at the same time, This may irk and demotivate those who are impatient. Eventually, threads “die” in discussion forums (Hewitt, 2005). Even though learners are given a time frame to discuss online, learners still differ in the rate of thinking, typing and sending messages. For urgent cases which need conclusions fast, face-to-face discussions would still be a better option (Wang & Woo, 2007). However, for synchronous online discussions with learners participating at

the same time, the response and efficiency may be better than asynchronous online discussions.

Based on the study of Wang and Woo (2007), interactivity and communication are another two themes which have been identified from the learners' reflections. The learners in their study find that it is easier to express themselves in face-to-face discussions as they do not need to pay as much attention to grammar and sentence structure. More interaction is also involved because it is easier than online discussions since it allows "multiple channels of communication" with nonverbal information from the gestures, tone of voice and facial expression (Johnson et al., 2000). Moreover, they can receive feedback instantly and clarify immediately. Since actions can be easily observed and identified in face-to-face discussions, less miscommunication will also happen. However, the findings of this study are inconclusive since the learners can use their mother tongue or dialects on top of English language in face-to-face discussions but only English language in written texts for online discussions. In addition, the topics of the discussion may be too complex and thus the participants struggle to answer the questions within the time limit in online discussions, causing little time for interactions. Furthermore, the learners in online discussions are allowed to access other internet resources and this may also affect the discussion.

Means, Toyama, Murphy, Bakia, and Jones (2009) have done a meta-analysis of more than one thousand studies related to learners' learning outcomes in courses conducted face-to-face and online. Forty-six experimental or quasi-experimental studies with scores or grades on standardised tests, research-created or teacher-created assessments for the treatment and control groups are selected. Though there is variability in conclusions but generally the main conclusion of the selected 46 studies is

that the recent online learning is modestly more effective than the face-to-face instruction (Means et. al, 2009).

In the study conducted by Sussman and Dutter (2010), they find that the performance of learners is basically similar whether the delivery is through face-to-face or online. This finding is somewhat different from the meta-analysis of Means et. al. (2009). However, the finding that learners' performance is almost the same in face-to-face and fully online delivery is consistent with the other research (Aragon, Johnson, & Shaik, 2002; Block, Udermann, Felix, Reineke, & Murray, 2008; Brown & Kulikowich, 2004; Dellana, Collins, & West, 2000; Donavant, 2009; Peterson & Bond, 2004; Shiratuddin, 2001; Thirunarayanan & Perez-Prado, 2002). However, it should be noted that the analysis of this research has not considered issues such as the selection of learners and the previous experience of learners with online delivery format. Even the researchers Sussman and Dutter (2010) admit that the conclusion may be misleading or incomplete due to loss of potentially valuable information of the sample means. Thus, they suggest future researchers to have a more complete portrait of learners before carrying out similar research.

Overall, language instructors need to be aware of the topics since some may not be appropriate for learners with lower language proficiency (Lee, 2009). In addition, research has also found that different activities may require different types of discussion. For example, activities which need much coordination may not be appropriate for online discussion where it is text-based and visual cues are primarily unavailable. However, problem-solving activities may be more suitable for online discussions (Berge, 1995; Hiltz, 1994; Moallem, 2003). To expose learners to a broad range of functional language discourse, it is also advisable to form groups with advanced learners so that

the others can have the chance to interact using the target language and be exposed to the language forms and functions (Lee, 2009). This informs the present study to create general discussion topics which only require learners to share their experience and opinions for the mixed-ability groups. Since such discussion topic would not be bias to either face-to-face or online discussion settings, it is more suitable for this research which focuses on learners' performance in different discussion settings. It should also be noted that this study does not compare spoken language in face-to-face discussions versus written language in online discussions as such. Instead, this study emphasizes the learners' performance in different discussion settings i.e. face-to-face and online discussions.

From the literature reviewed, synchronous online discussions share more similarities to face-to-face discussions when compared to asynchronous online discussions which are more formal and receive slower response. Thus, the present study compares the discourse of face-to-face discussions with synchronous online discussions. Despite that, there are still many differences between synchronous online discussions and face-to-face discussions. The differences include access, mode of expression, visual cues, atmosphere, response, efficiency, interactivity and communication. The following sections intend to find out more about the difference between face-to-face and online discussion settings, particularly at (1) group composition and student interaction and (2) ESL learners' participation style, lexical complexity and interactive competence.

2.6.1 Group Composition and Student Interaction

According to Long's Interaction Hypothesis (1996), the interactions among learners are critical in the learning of a second language. Since interactions among

learners can be influenced by group composition, it would be interesting to learn the effects of different discussion settings and group composition on learners' interactions. The few studies on these areas are reviewed to guide the conduct of this study.

One of the studies was by Chen and Wang (2009). They investigated the social conversation of 487 high school learners in online discussion forums and found that group cohesion and social interactions were required for discussions to be carried out effectively. The term "effective discussions" in their study referred to sustained discussions which focused on topics related to the learning objectives (Guzdial & Turns, 2000). They found that simply creating an online discussion forum would not ensure the effective usage of it for learning purposes. Social dynamics among group members should also be considered during the implementation of group discussions because problems with the social dynamics among group participants were often a major cause of ineffective group discussion (Hobaugh, 1997 as cited in Chen & Wang, 2009). This finding informs the significant role played by social dynamics in affecting group effectiveness and also the value of social interaction to effective discussions. Apart from social dynamics, a conducive environment is also needed before learners are able to produce or critique ideas of their friends and regard criticism to be valuable rather than as an insult (Rourke, 2000). Noting the importance of social dynamics and the environment of the discussions, the present study considers these important aspects by looking at the varied personalities and language proficiency of the ESL learners in different discussion environments. This act would hopefully provide further insights into the current literature.

In another study conducted by Tutty and Klein (2008), the collaboration of learners in different group composition in online and face-to-face environments was

compared. The groups comprised of 120 undergraduate pre-service teachers in the United States and they were categorised into homogenous lower-ability, homogenous higher-ability and heterogeneous-ability groups. Learners' performance in individual post-test, group project, interaction behaviour in synchronous computer-mediated communication and attitudes were investigated. This study found that the participants performed significantly better in the online collaborative setting although learners gave more positive response to face-to-face collaboration mode. More positive response may be given to face-to-face condition since visual cues are more apparent than in virtual condition where they need to assume the meaning during collaboration (Hara, 2002; Sapp & Simon, 2005).

In a virtual setting, learners in the study of Tutty and Klein (2008) asked more questions and performed significantly better in the project than those who did it face-to-face. This means that the online setting may be better for learners to solve ill-structured problems. On the other hand, the students who worked face-to-face showed significantly better performance on the individual post-test than those working online. The reason may be that the face-to-face environment is more suitable for learners to acquire well-defined facts and procedures. From the findings, both online and face-to-face collaboration are useful in achieving certain learning objectives. However, the type of task and the collaborative structure must be considered in the design of the lesson. For ESL lessons, collaboration which requires learners to work together by communicating using the target language is vital. Thus, a virtual environment which encourages learners to be more active and ask more questions would motivate them to practise using the language.

Results of the quasi-experimental study by Tutty and Klein (2008) also showed that learners with higher ability had better post-test scores when they worked face-to-face with learners who also had higher ability. When higher-ability students worked with lower-ability students, they were found to perform better when they collaborated virtually. On the contrary, lower-ability learners performed worse in virtual condition but scored better on the post-test when paired with higher-ability learners in face-to-face condition. This may be due to the synchronous chat feature used in this study which may increase cognitive load especially for them who had little or no prerequisite knowledge about the computer applications. Whether in online or face-to-face conditions, lower-ability students showed negative impact on learning problem-solving, facts and procedures when paired with similar ability students. This finding confirms the other researchers' studies which suggest creating mixed-ability groups for collaborative work and this is especially beneficial for lower-ability learners in face-to-face environments (Saleh, Lazonder & De Jong, 2005; Slavin, 1993; Uribe, Klein, & Sullivan, 2003). With this finding, the present study aims to learn more about the online environment empirically through the use of mixed-ability groupings.

In another research that studied online group discussions, Son (2002) evaluated the interaction styles and perceptions of 22 distance learners based on the transcripts of postings in CALL-related discussions and learners' responses to online questionnaire. In the discussions, the instructor played the main role of observing and guiding. Learner-learner interaction was maintained and this seemed to allow learners to form their own ideas and learn for themselves in the online discussions. The online discussions contained 93% student-student interactions and student-teacher interactions were only 7%. The learner-learner interactions showed a high degree of collaboration among the peers in an online setting and this result is similar to Kamhi-Stein's (2000) findings.

This shows that online discussions may benefit learners in providing group interaction, collaborative learning, speed and convenience.

Online discussions also have the potential to improve the relationship among learners. In a qualitative study by Powers and Mitchell (1997), they found that the online environment can establish closer rapport among the learners of a web-based graduate course. This is because they have more time to ponder on their replies and can remove sentences which are deemed aggressive to avoid unhappiness. However, Kiesler, Siegel and McGuire (1984) reported a different result in which participants in online discussions tend to be less inhibited but more aggressive and give more negative comments. Despite that, it is argued that online discussions can afford more equal opportunities for learners to share their opinions and they are usually less influenced or controlled by others. In other words, online discussion can provide a freer, more conducive and comfortable environment for balanced participation and the opportunity for all members to be heard (Vonderwall, Liangg & Alderman, 2007; Warschauer, 1996). This can benefit learners in subordinated positions such as those who are shy, reticent, introverted, face language difficulties or dislike speaking in front of the other learners because they can give themselves the chance to be heard when communicating through online discussions (Belcher, 1999; Kern, 1995). On the other hand, in face-to-face discussions, pragmatic language skill is considered a premium and may be challenging for learners who have not mastered the classroom discourse or those who are shy and of different culture (Schallert et al., 1999).

A review of the literature about group composition and student interaction finds that the group members and the discussion setting can influence the way learners interact in a group discussion. Thus, this study will try to control the selection of the

sample by not just looking at their personalities but also their levels of English language proficiency. A carefully selected sample is hoped to fill the gap in the current literature (please refer to *Section 1.4: Research Gap* for details). Since the important aspects of personality and language proficiency of the ESL learners have not been looked into together in the area of CALL, the findings of this study would better inform the readers about the effects of different discussion settings to different types of learners on their discourse and participation style.

The next section describes the discourse and participation style of the ESL learners when they participate in face-to-face and online discussions. Due to the wide scope suggested by the word *discourse*, it should be noted that this study only focuses on the lexical complexity and interactive competence of the ESL learners.

2.6.2 Participation Style, Lexical Complexity and Interactive Competence

A speech that is produced in face-to-face communication is usually rapid and dynamic and is for consumption in the same manner (Yates, 2001). On the other hand, online discussions which involve typing are static with self-paced production by the sender and self-paced reception by the recipients (Yates, 2001). This difference is likely to vary the participation style and use of language among the ESL learners in face-to-face and online discussions.

The participation styles of learners in face-to-face and online discussions were investigated by Kamhi-Stein (2000b), Marjanovic (1999) and Sullivan (1998). They found that the discussions held in an online environment can enable ESL learners to be more active when discussing with the native speakers. In their research, ESL learners

were found to interact more when they discovered that they were judged by their communicative skills and not their ethnic or native language as in face-to-face discussions. The online environment has enabled the names and aural and visual paralinguistic cues to be obscured. This helped to increase the level of participation among non-native English speakers and equalised the opportunity for participation among class members.

When similar research was carried out only on second language learners where there were no native speakers and when pseudonyms were not used, more balanced participation was also found in the online discussions as participation became more equally distributed and not dominated by a few participants (e.g. Beauvois, 1998; Bohlke, 2003; Fitze, 2006; Kern, 1995). The more balanced participation may be a result of the lack of need for turn taking and the need to wait for the other person to finish writing before composing his or her messages; he or she can start to compose even when the other participants are writing (Beauvois, 1998; Kelm, 1992).

Apart from encouraging more balanced participation among learners during discussions, peer support and collaboration are also promoted in the online setting while face-to-face discussions usually show the pattern of initiation-response-evaluation (Kamhi-Stein, 2000). In the study of Kamhi-Stein (2000), more student contribution and less instructor's participation was also found in online discussions. She thus proposed technology which effectively encourages collaboration among learners to be integrated in the teaching and learning process. This is consistent with many of the research which shows that the quality of learner-learner discussions in an online setting may be better than the discussions carried out face-to-face (Collins & Collins 1996; Naidu, 1997; Oliver & Omari, 2001; Uribe et al. 2003). The higher quality interactions in the online

setting may be due to the nature of CMC which allows learners to reflect (Jonassen, Davidson, Collins, Campbell & Haag, 1995). When students reflect while writing, it encourages them to analyse, evaluate, synthesise and develop higher order thinking skills (Adelskold, Alklett, Axelsson, & Blomgren, 1999; Garrison, 1997; Jonnassem et al., 1999; Sapp & Simon 2005). In other words, the characteristics of online discussions can provide enhanced opportunities for better quality discussions with higher-order thinking skills involved (Naidu, 1997; Oliver & Omari, 2001).

ESL researchers have also found that the self-paced setting and visual salience of written discourse in online discussions are able to enhance learners' chances in noticing their errors and modifying their output (e.g., Blake & Zyzik, 2003; Lai & Zhao, 2006; Lee, 2006; Smith, 2008; Sotillo, 2000). The mean type/token ratios also show that the vocabulary use in online discussions is more similar to writing than to speech (Yates, 2001). On the other hand, speakers in face-to-face environment are inclined to use more constricted range of lexical choices as they barely have time to go through all the choices and would normally pick the first words that cross their minds, resulting the use of vocabulary in face-to-face communication to be less varied (Chafe & Danielewicz, 1987). In spite of the influence of the mechanical aspects of the medium, the use of vocabulary is also affected by the society and culture or the social context (Halliday, 1985). More detailed studies also find that CMC has styles or genres that are between the oral and the writing (Yates, 2001).

In a study comparing discussions in face-to-face and online environments, Warschauer (1996) also found similar results to Kamhi-Stein (2000), Marjanovic (1999) and Sullivan (1998) in which the online discussions showed more balanced participation when gini coefficient (please refer to Appendix 3 for further explanation) was used to

measure inequality. Apart from that, Warschauer (1996) also noticed that in the online setting, the discourse displayed more lexical complexity when he compared the type-token ratios of the two different discussion settings. Type-token ratios are the “total number of unique words, or types, divided by the total number of words, or tokens” (Scott, 2006). Type-token ratios or lexical density can help to investigate the nature of a medium (Yates, 2001). When the type-token ratio is higher, it means that the writing is more complex lexically (Ortega, 1997). Wider range of vocabulary was also found in the online environment due to the increased processing and planning time (Ariza & Hancock, 2003). Learners could observe and edit their message and this brought about a higher quality interlanguage (Krashen, 1985). From their studies, Warschauer (1996) and Ortega (1997) found that the use of gini coefficient and type-token ratios are useful in forming “theory of communication” in online discussions and suggest the need for more research studying groups of different sizes.

Both of the suggested measures (gini coefficient and type-token ratios) by Warschauer (1996) and Ortega (1997) were used by Fitze (2006) in his study which also compared the discourse and participation style of ESL learners when discussing in online and face-to-face settings. The sample in Fitze’s research (2006) consisted of 27 advanced ESL students who were studying in the university. Different from Warschauer’s study (1996), Fitze (2006) investigated the discourse and participation style of the interactions among larger group of students. There were 12 to 13 students in a group compared to Warschauer’s study (1996) which only had four in a group.

In his study, Fitze (2006) conducted four weeks of observation on the discussions in both types of discussion environments. In face-to-face discussions, the researcher together with all the learners discussed a topic in a class. Similar whole-class

discussion was held in the online setting with the difference of students being seated in front of the computer in a computer lab and typing words to be read by other classmates. A day before the discussion, the topic was given to the learners and was reviewed by the classroom teachers so that the learners were clear about the general meaning and vocabulary. During the discussions, the university students had 20 minutes to discuss the issues. After that, they began to draft their essays in the next 30 minutes of the lesson. The essays, however, were not taken into account in his research.

In Fitze's study (2006), statistically significant difference was not found in the total number of words contributed by the ESL learners in the two different discussion settings though there was an increase in the percentage of student participation in the online setting. However, the discourse in online discussions showed significantly greater lexical range and enhanced interactive competence. This meant that second language learners were better in using and practising a broader range of topic-related vocabulary in the online discussions. Fitze (2006) has also found more balanced participation in online discussions. Interestingly, more balanced discussion in the online setting was only found in one of the groups but not for the other group which has shown quite equal distribution no matter in face-to-face or online. This pointed a need for future studies to investigate the variables like speaking fluency, shyness and introversion that could mediate the participation style in face-to-face and online discussions. In addition, the procedure of informing the participants about the topic a day before the discussion may also make the results doubtful because learners could have prepared themselves in a different ways before the experiment. Moreover, the review of the vocabulary and general meaning of the topic to the two groups were conducted by different teachers and this can also cause a disparity among the performance of the different groups.

Since this study is similar to Fitze (2006), the weaknesses found are eliminated for more reliable and significant findings. This research will only reveal the discussion topic during the discussion and look into the aspects such as language proficiency and personality of the learners. The following section describes the influence of ESL learners' personality in discussions.

2.7 The Influence of ESL Learners' Personality in Discussions

For interaction to impart messages that can trigger learning, the various ways people act, learn and make use of media must be considered (Jurin, Roush & Danter, 2010). Personality can affect the way one communicates in the way one receives and processes information and the way one prefers to deal with others (Jurin, Roush & Danter, 2010). For instance, the extroverts are more adventurous and assertive and thus believed to be better in language learning (Kow, 2012). On the contrary, the introverts are argued to be less suited to language learning due to their inhibition which discourages them from taking risk in experiencing with the target language and hence affects their language learning process (Kow, 2012).

According to Skinner (1968), the failure to cater for the differences among learners may be the biggest source of inefficiency in teaching and learning. Learners are the most important people in the teaching and learning process and should be at the top of the organisational chart rather than the bottom (Reigeluth, 1999 as cited in Whitlock, 2001). Thus, ESL instructors and instructional designers are urged to put in more effort and time to analyse their learners, learning content, context and technology (So & Brush, 2008).

The influence of students' personality on online discussions has been studied by Chen and Caropreso (2004). The findings showed that personality can influence communication type and pattern but not the length of the messages. Introverted students who were less socially outgoing and more reserved were more inclined to engage in one-way communication while extroverted students usually engaged in two-way communication and learned collaboratively. When extroverted and introverted students were grouped together, the rate of two-way communication among introverted students increased significantly as the discussions progressed. The findings suggest that there should be a mixture of extroverted and introverted students in the same group for more effective online communication. The authors further added that students with different personalities may favour different methods of communication and this can affect the group dynamics, performance and production of students during discussions. However, Chen and Caropreso (2004) have not studied whether introverted or extroverted learners engage better in face-to-face or online discussions. Furthermore, the authors also pointed a need to analyse online discourse in future research for a better understanding of the extent personality can affect message content and in developing productive learners.

From the qualitative research of Whitworth (2009), he postulated that learners who were timid can try out new linguistics forms better when they were online since the consequences of face-threatening acts usually would not exist or were drastically reduced in an online environment. This is also supported by Jonassen (1994) who found that the introverted learners produced more words in online discussions as they could take their time to respond. However, the studies conducted by Jonassen (1994) and Whitworth (2009) only analysed the learners' productions in discussion forums. An

empirical study which compares face-to-face and online discussions is needed to gain better insight on how the different types of learners behave in different discussion settings. It is the aim of this study to utilise the right platform for the right learners to realise discussions to its full potential.

After looking at the influence of learners' personality on their participation style and language production, the next section looks into another important variable which is the learners' language proficiency.

2.8 The Influence of ESL Learners' Language Proficiency in Discussions

Research has found that the learners who have lower language proficiency suffer significantly higher level of language anxiety while the more proficient learners are more motivated and unembarrassed to use the target language (Macintyre, 1995). According to Krashen's affective filter hypothesis (1981), a learner who has lower level of language anxiety will be more receptive to comprehensible input and more successful. Since language proficiency and language anxiety are negatively correlated (Macintyre, 1995), this suggests that the level of learner's language proficiency can impact their performance and learning process in a discussion. Thus, investigations on the way language proficiency may affect the quality and quantity of communication among learners is crucial in the design of a conducive ESL learning environment (Iwashita, 2001)

In a study conducted by Porter (1986) in face-to-face situations, she examined the language produced by 12 learners with intermediate and advanced level of language proficiency in three communicative tasks. She did not find statistically significant

difference in the total number of words, the fluency and accuracy of language between the two groups of learners who have different proficiency levels. The result is in contrast with Collentine (2009) who reported that more proficient learners produced more language. Another study which was conducted by Iwashita (2001) also reported no significant difference between the more proficient and less proficient learners in the quantity of words produced. Despite that, the groups consisting of more proficient learners were found to produce less clarification request and confirmation checks than the less proficient learners but the difference was insignificant.

Arslanyilmaz (2012) also investigated the relationship between language proficiency and language production of non-native speakers in four communicative tasks held in an online setting. 14 groups worked collaboratively on a chat tool called WebCT-Vista. Seven of the groups were at intermediate level while the other seven were at advanced-level language proficiency. The aspects of language production investigated were accuracy, fluency, negotiation of meaning, lexical complexity and syntactic complexity. The findings showed that the learners with intermediate level of language proficiency involved in more negotiation of meaning. This may be due to the more trouble they had in communicating with each other. On the other hand, the learners with advanced level of language proficiency produced language more accurately. The more proficient learners were also found to produce more words and more lexically complex language. However, the fluency and lexical complexity of the more proficient learners was not significantly better than the less proficient learners. Arslanyilmaz (2012) felt that the limited number of participants in his study has caused the insignificant findings and more participants would gather different results. As such, this study involved more number of participants and hopefully significant results can be obtained.

It should also be noted that the findings by Arslanyilmaz (2012) is found different from Porter's (1986) study who reported that the more proficient advanced-level learners produced language with similar accuracy to the intermediate-level learners. This could be due to the environment where the task was carried out. In Porter's (1986) study, the task was held face-to-face in aural form while Arslanyilmaz's study was held online and in written forms. A study which compares the discussion settings with learners of different language proficiency levels is thus needed.

In Malaysia, Tam (2009) has conducted a mixed-method research to compare the ESL learners' interactions in synchronous online and face-to-face environments. The participants were divided into pairs to take part in four decision-making tasks. From the experiment carried out with the participation of 32 female undergraduates from high and low proficiency levels, she found that the learners with high language proficiency performed well in both environments while the low-proficiency learners produced longer turn lengths in synchronous online discussions even though fewer words were still produced regardless of the medium of communication. However, the results of Tam's (2009) study were not found to be statistically significant and the small sample size was believed to be one of the reasons. Thus, the present study included more participants (48 learners) for the comparative study of discussions in face-to-face and online settings. In addition to investigating the learners' proficiency level, this study also looked at the learners' personality so as to provide a more comprehensive view of different learners' linguistic output in different discussion conditions.

2.9 Conclusion

From the literature review in this chapter, it is learned that the different discussion settings and the individual differences of the learners can have an effect on the ESL learners' discourse and participation style. The literature has also shown the need for a more carefully planned empirical study to inform ESL researchers and language instructors about the ways to carry out a discussion effectively in an ESL class. Although the academicians and researchers have contradicting ideas and findings, it is important to seek answers to the many remaining unanswered questions for an improvement in the field of CALL.

This study aims to find out the effects of different discussion settings on ESL learners' participation style, lexical complexity and interactive competence. The discussion settings investigated in this study are face-to-face and online discussions. Learning that the other variables that may also intervene the results, this study also looks at learners' personality and language proficiency. The next chapter, Chapter 3, highlights the methodology that is adopted in this research.

CHAPTER THREE

METHODOLOGY

3.1 Overview

Chapter 1 and 2 have identified computer-mediated communication (CMC) as an area which requires further study. This study investigates this area by comparing the use of synchronous online discussions to the traditional face-to-face discussions to elicit a comprehensive illumination of the successful application of discussions among ESL learners. The individual differences of the learners are postulated to be an important influence to the participation style and discourse of the learners in different discussion settings. Thus, this study looks into these aspects and the research questions that guide this study are as follows.

1: Given the same amount of time for discussions in face-to-face and online settings, how do the contributions of the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) differ?

2: What type of participation style is shown by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) in face-to-face and synchronous online discussions?

3: What is the difference in the lexical complexity displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

4: What is the difference in the interactive competence displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

This research mixes both quantitative and qualitative approaches in the attempt to seek answers to the research questions stated above. Quantitative analysis was based on the performance data gathered from the experiment which involved eight discussions; four online discussions and four face-to-face discussions. Numeric data from the survey which was administered after the experiment was also included as part of the quantitative analysis. For the qualitative analysis, it was developed from the quantitative data and was based on the performance data during the experiment and also the reflective comments of the participants towards the different discussion settings. This chapter provides a detailed account of the methodologies used for this research. It covers the theoretical framework, setting, participants, teacher/researcher, research design and methods, procedures, instrumentation, pilot tests, data collection and recording, data analysis, triangulation, validity and methodological framework.

3.2 Theoretical Framework

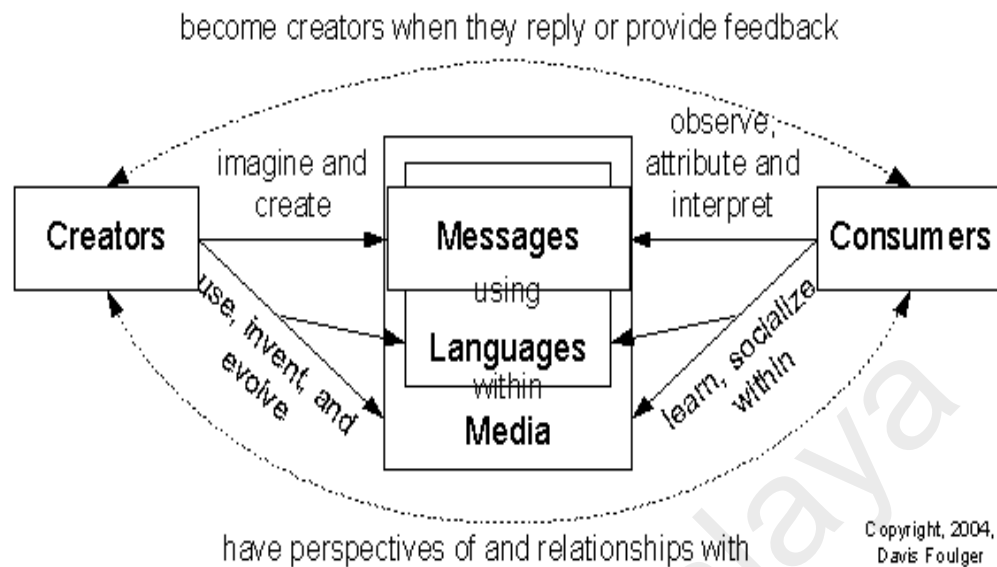


Figure 3.1: The Ecological Model of the Communication Process (Foulger, 2004)

According to Foulger (2004), communication is the process in which human beings create representations of meaning so that others can interpret. The relationship of the medium, language, and message is vital in the *Ecological Model of the Communication Process*. This model, as shown in Figure 3.1, depicts communication between people which involves:

- 1) “who” – the person who creates the messages
- 2) “says what” – the content of the messages
- 3) “in which channel” – the languages and media used
- 4) “to whom” – the recipients of the messages

As illustrated in Figure 3.1, creators and consumers communicate through the mediation (proposition 1) of message (proposition 4) produced and interpreted (proposition 3) using language within media (propositions 2, 5, and 4.1). The related propositions for Foulger’s (2004) *Ecological Model of the Communication Process*

which is indicated in parenthesis have been explained in *Section 2.4.6: The Ecological Model of Communication*. The complete list of propositions can also be referred to in *Table 2.1: Propositions for the Ecological Model of the Communication Process*.

For this research, the “creators” and “consumers” refer to the introverted and extroverted second language learners who have high-intermediate or low-intermediate language proficiency. On the other hand, “media” refers to either face-to-face or text-based online settings. “Messages using languages” will be analysed by looking at number of words produced, lexical complexity and interactive competence.

Foulger (2004) has come out with a number of relationships and propositions from this model. Some of the important ones which are relevant to this study are:

Proposition 1: All communication is mediated.

Proposition 2: Communication is mediated by three separate but interrelated constructs: (1) the message, (2) the languages that the message is encoded in, and (3) the medium or media in which the encoded message is transmitted, stored, and/or processed.

Proposition 3: When engaged in the process of communication, people act in two distinct roles: creator and consumer. The creation role is associated with the instantiation of representations of meaning. The consumption role is associated with the interpretation of representations of meaning. Each role has a different relationship to communication, even when both roles are concurrently associated with the same person.

Proposition 4: Communication is instantiated in messages.

Proposition 4.1: Communication is instantiated using languages and media.

Proposition 5: Messages are instantiated using language and media.

Proposition 8: Languages are instantiated using media. Every medium entails a set of possibilities for language that shapes what languages are used.

(* Propositions 6, 7 and 9 can be referred to in Table 2.1 under Section 2.4.6. These propositions have been left out so as concentration can be put on the propositions which are more relevant to the interest of this study)

Propositions 1 to 5 describe the role of the people in a communication mediated by three interrelated elements: medium, language and message. Propositions 8 further emphasises the importance of a medium in the way it affects the use of a language. A medium can change the way people communicate as different media can support different languages in different ways. For instance, written language and facial expressions cannot be employed to express meaning in purely audio media like telephone and radio. Likewise, in certain visual media like newspapers and letters, spoken language cannot be used.

Despite the importance of language and media in influencing a message, the most crucial part of communication still lies on the people who act as a creator and consumer of the message (as mentioned in proposition 3). This is because without people who create the language, medium and message, communication cannot occur at all. Since human beings are equipped with individual differences, the way they behave when they communicate in different environments also differs. For instance, in a text-based online discussion, introverts and extroverts may use languages differently with the absence of facial expression, gesture and descriptive details.

Besides influencing the language, the characteristics of a medium can also have an effect on the number of people who can receive the message, the speed for the messages to arrive to the consumers, the time a message can be consumed, and the way people act when they create, consume and process messages within a medium. With reference to proposition 8, the way language is used can be confined by the medium. Thus, communication is a complex process and this study aims to provide insight into communication held in different environments by investigating the language production of the ESL learners with different personalities in online and face-to-face discussions.

3.3 Setting

This study was carried out in a fully residential science school in Kuala Lumpur. Over the four weeks in August 2011, online discussions were held at a computer laboratory while face-to-face discussions were held at a meeting room. The meeting room rather than the classroom was used in this study because the circular arrangement in the meeting room enabled all the participants to see each other easily (Harmer, 1998). It would not be quite possible with the orderly row arrangement in the participants' classroom (Harmer, 1998).

In this study, the face-to-face discussions were videoed for transcription. Two video cameras were used so as to capture a better view of the experimental conditions. On the other hand, the synchronous online discussions were conducted online at the website *Learning English in an Interactive Way*; a web-based discussion board forum with template structure. The selection and the background of the participants in this study are described in the next section.

3.4 Participants

In this study, all 48 participants were 16-year-old females who were studying in an urban secondary school. These ESL learners were divided into two groups of 24. With 24 participants in each group, the number of participants in this study was more than Fitze's study (2006) which only had 13 and 14 ESL learners for the two experimental groups (please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence* for more information on Fitze's study). A larger number of learners were involved in the quasi-experiment of this study so as to

find out ways to encourage active participation among learners in a large-class discussion setting.

Twenty-four participants were also chosen to participate in this study as it fit into the recommended number for active online discussions and did not exceed the number of members that can lead to subgroups and greater anonymity among members in large group discussions (Jacques & Salmon, 2006; Rovai, 2007). According to Rovai (2007), online discussions would be optimum with 20 to 30 members. Jacques and Salmon (2006) also stated that large group discussions with more than 25 members whether in a face-to-face or an online setting could be problematic (Jacques & Salmon, 2006). For instance, in face-to-face discussion, the room or the seats may not be enough while in online discussions, the messages may be too much and some had to be ignored (Jacques & Salmon, 2006). Since this study investigated whole-class or large group discussions with learners who had different personalities and language proficiency, the number of participants had to be higher to produce more reliable findings for the different groups of learners. As Jacques and Salmon (2006) did not recommend discussions with more than 25 members, this study has selected 24 participants for each group.

To determine the personality of the students in this study, the participants answered a survey developed by Oxford (1993): *Style Analysis Survey (SAS): Assessing Your Own Learning and Working Styles* (please refer to Appendix 4 and Section 3.8.1: *Style Analysis Survey* for details). This survey was chosen over other personality tests such as the more popular Myers-Briggs Type (Jurin, Roush & Danter, 2010) because it was more focused on language learning (Cohen & Doˆrnyei, 2002).

In the SAS survey, there were 20 items in Activity 2 (please refer to Appendix 4) which gave an indication of students' personality; whether they were extroverts or introverts. The relevant 20 items from Activity 2 were retyped and administered to 200 students (please see Appendix 5). These students were required to circle the immediate answers that best represent their attitudes and preferences. After that, they added up their scores for items 1 – 10 which measured extroversion and items 11 – 20 which measured introversion. If their scores for items 1 – 10 were higher than items 11 – 20 then they would be placed in the extroverts group and vice versa. However, if the difference in scores for items 1 – 10 and 11 – 20 were less than two points, the respondents were characterised as balanced type. In this case, the extroverted learners were defined as learners who were more sociable and preferred social interactive tasks while the introverts were learners who tend to withdraw from social contacts and preferred more independent tasks and enjoy working with someone they knew well (Oxford, 1993). The students with the most extreme extroversion or introversion scores were selected as participants because some may have both extroversion and introversion dominating them. The selection of participants was also matched with teacher's observation of the students for the past six months before the experimentation was carried out. For example, Participant 1 (Group A) was selected because her score for extroversion and introversion in the SAS survey was 22 – 7. She was considered as an extreme extroverts and the teacher also found that she was very active and sociable in the class. In contrast, when a learner scored 13 – 11 with the scores for extroversion being 2 points higher than her introversion, she was not selected as she was considered balanced and her performance in class was also more reserved than Participant 1 (Group A).

The language proficiency of the participants was determined from their scores in mid-year examination and school-based oral assessment. The mid-year examination was prepared by the school teachers following the format of SPM public examination; sat by all the seventeen-year-old Form 5 Malaysian students. The English paper which consisted of Paper 1 and Paper 2 assessed learners' language proficiency in English language with a focus on reading and writing skills (please refer to Appendix 2 for the exam paper). On the other hand, school-based oral assessment was used in this study to gather information about the participants' listening and speaking skills. This assessment was also a part of the SPM examination and the rubric of this assessment was as shown in Appendix 1.

Students' personality and language proficiency were controlled in this study to prevent these variables from affecting the analysis of the discourse and participation of students in face-to-face and online discussions. The findings of this study can be affected if the sample was not carefully selected. For instance, if one of the groups was dominated by the extroverts who had very good proficiency level and the other by a group with extroverts from lower proficiency level, the discourse and participation style of students may not be reliable as it would be influenced by the intervening variable of students' proficiency level. Since Fitze (2006) mentioned the possibility of students' personality and language proficiency in influencing the data of his study, the personality and language proficiency of students were controlled in this research. Both experimental groups were balanced in the number of learners with different personality types (12 introverts and 12 extroverts) and language proficiency levels (12 high-intermediate and 12 low-intermediate). More specifically, the group composition of each group was as follows:

- 6 high-intermediate learners with extroverted personality
- 6 high-intermediate learners with introverted personality
- 6 low-intermediate learners with extroverted personality
- 6 low-intermediate learners with introverted personality

From a total of 200 enrolled students, 24 sixteen-year-old female students were selected to participate in this study. Right from the beginning of the briefing session, these learners were aware that their participation in this research was voluntary and have signed the consent letter (please refer to Appendix 6). The consent letters were also signed by their parents or legal guardians and the school representative.

The selected participants in this study were all 16 years old female students. All were Malay except for one Chinese and one Indian student. This is a representative of the population in the school in which a majority of the learners were Malays. All these students were familiar with the use of computers and Internet as they had access to them at home and were exposed to the use of it at school.

In this study, the introverted and extroverted students with high-intermediate and low-intermediate language proficiency participated in the discussion together. These students who had different characteristics were not separated as previous research (Saleh et al., 2005; Slavin, 1993; Tutty and Klein, 2008; Uribe et al., 2003) has found mixed-ability groups to be more suitable for collaborative work such as discussion activity (please refer to *Section 2.6.1: Group Composition and Student Interaction*). The details of the participants were summarized at the end of this section in Table 3.1 and Table 3.2. The number was used to replace the names of the students. Students

numbered 1 to 6 and 13 – 18 were extroverts while students numbered 7 to 12 and 19 to 24 were introverts.

For the language proficiency of the learners, participants numbered 1 to 12 were in high-intermediate level while 13 to 24 were in low-intermediate level. The results of oral test and mid-year exam have been gathered to give an indication of the learners' language proficiency level in listening, speaking, reading and writing. From the scores of all the students, the top 20% results were categorized as high-intermediate while the bottom 20% were categorized as low-intermediate. The learners with high-intermediate language proficiency were considered more proficient in English language with a score of 27 or 28 out of 30 marks for their oral test (please refer to Appendix 1 for the school-based oral assessment rubric and form) and also a *B+* or *A-* in their mid-year examination (please see Appendix 2 for the exam paper). On the other hand, the low-intermediate language proficiency learners had lower scores in the school-based oral assessment and mid-year examination. Their oral test result ranged from 23 to 26 out of 30 marks and their score for mid-year examination is *C+* or *C*.

The breakdown of the marks and grades for both the school-based oral assessment and mid-year examination was according to the scale set for SPM public examination. It should be noted that the range for the school-based oral assessment appeared to be small (low-intermediate: 23 to 26 out of 30 marks; high-intermediate: 27 to 28 out of 30 marks) because the format of the assessment allowed the learners to prepare and practise in advance. Thus, almost all the learners have prepared and performed above satisfactory level. Despite that, the difference between high-intermediate learners and low-intermediate learners could still be seen with the high-intermediate learners getting more *Excellent* bands for the assessed constructs while the

low-intermediate learners mainly scored *Good* (please see Appendix 1 for the rubric). Since the difference in the marks for *Excellent* and *Good* bands was only one to two marks, the range of marks for the school-based oral assessment seemed small. This can be observed from the learners' scores in their oral test in Table 3.1 and Table 3.2.

Table 3.1 and Table 3.2 also show the details of the participants of Group A and Group B. Overall, the participants have been carefully selected based on their personalities and language proficiency so that the influence of their individual differences on their discourse and participation style in different discussion settings (face-to-face and online) can be studied carefully.

Table 3.1: Details of the Participants of Group A

Participants	Personality	Language Proficiency	Oral Test (/30)	Mid-Year Exam
1	Extroverts	High-intermediate	28	71 (A-)
2	Extroverts	High-intermediate	28	69 (B+)
3	Extroverts	High-intermediate	28	71 (A-)
4	Extroverts	High-intermediate	28	69 (B+)
5	Extroverts	High-intermediate	28	74 (A-)
6	Extroverts	High-intermediate	28	75 (A-)
7	Introverts	High-intermediate	28	77 (A-)
8	Introverts	High-intermediate	27	68 (B+)
9	Introverts	High-intermediate	28	68 (B+)
10	Introverts	High-intermediate	27	70 (A-)
11	Introverts	High-intermediate	27	67 (B+)
12	Introverts	High-intermediate	28	66 (B+)
13	Extroverts	Low-intermediate	24	55 (C+)
14	Extroverts	Low-intermediate	24	57 (C+)
15	Extroverts	Low-intermediate	24	53 (C)
16	Extroverts	Low-intermediate	25	52 (C)
17	Extroverts	Low-intermediate	23	50 (C)
18	Extroverts	Low-intermediate	25	52 (C)
19	Introverts	Low-intermediate	25	58 (C+)
20	Introverts	Low-intermediate	25	57(C+)
21	Introverts	Low-intermediate	26	57 (C+)
22	Introverts	Low-intermediate	25	57 (C+)
23	Introverts	Low-intermediate	25	56 (C+)
24	Introverts	Low-intermediate	23	53 (C)

Table 3.2: Details of the Participants of Group B

Participants	Personality	Language Proficiency	Oral Test (/30)	Mid-Year Exam
1	Extroverts	High-intermediate	28	73 (A-)
2	Extroverts	High-intermediate	27	75 (A-)
3	Extroverts	High-intermediate	28	79 (A-)
4	Extroverts	High-intermediate	28	73 (A-)
5	Extroverts	High-intermediate	27	69 (B+)
6	Extroverts	High-intermediate	27	74 (A-)
7	Introverts	High-intermediate	28	78 (A-)
8	Introverts	High-intermediate	27	74 (A-)
9	Introverts	High-intermediate	28	68 (B+)
10	Introverts	High-intermediate	27	68 (B+)
11	Introverts	High-intermediate	28	68 (B+)
12	Introverts	High-intermediate	27	69 (B+)
13	Extroverts	Low-intermediate	25	59 (C+)
14	Extroverts	Low-intermediate	25	59 (C+)
15	Extroverts	Low-intermediate	24	59 (C+)
16	Extroverts	Low-intermediate	24	52 (C)
17	Extroverts	Low-intermediate	24	55 (C+)
18	Extroverts	Low-intermediate	23	51 (C)
19	Introverts	Low-intermediate	25	59 (C+)
20	Introverts	Low-intermediate	23	59 (C+)
21	Introverts	Low-intermediate	24	59 (C+)
22	Introverts	Low-intermediate	25	59 (C+)
23	Introverts	Low-intermediate	24	56 (C+)
24	Introverts	Low-intermediate	25	57 (C+)

After learning about the participants, the background and the role of the teacher who facilitated the discussions are explained in the next section.

3.5 Teacher/Researcher

Only one ESL teacher was involved in facilitating the online discussions to avoid discrepancy in teaching styles that might result from different attitudes towards integration of ICT and different levels of computer proficiency (Fitze, 2006; 2008). When a teacher was unfamiliar with the use of computer and did not favour the use of Internet for discussions, he or she might complain when technical difficulties arose.

This can affect the learners' mood and perception of the task. Thus, in this study, only one teacher who was familiar with the use of the computer and had positive attitude towards both face-to-face and online discussions was selected. This can reduce the threat to internal validity as the handling of both face-to-face and online discussions was by the same person (Fitze, 2008).

In this study, the discussions were conducted by the researcher herself who was an experienced and qualified ESL teacher in the participating school. The teacher/researcher has earned a first class honours degree in the Bachelor of Education (Teaching English to Speakers of Other Languages) and has taught English language for more than seven years.

In the face-to-face and online discussions, the teacher/researcher restated the topic and questions in the beginning of the discussions, encouraged student-student interactions by staying aside and only summarised to close the discussion. She only interrupted when necessary and refrained from giving novel suggestions, thoughts or instances related to the discussion topic. This was done to maintain the researcher's role in the discussions which was to read the discussion questions, observe learners' interaction and signalled the ending of a discussion when the time was up. Since the focus of this study was the students, the teacher/researcher mainly stood aside as an observer and the students took the central role in the discussions.

The teacher's voice was only heard once during one of the face-to-face discussions when an extroverted student in Group A specifically asked clarification from the teacher. A very brief answer of 'yes' was given to the student. This was to encourage the discussion to go on among the students without much interruption from

the teacher. At the end of the discussion, the researcher gently reminded the participants about the exclusion of the teacher in the learner-learner discussions and repeated the reminder before the other discussions started so that the participants would remember their roles and their teacher's position. The language contribution by the researcher was kept to minimal and consistent for all the discussions. Doing so also helped to empower and encourage the learners to be independent in taking charge of their learning (Kow, 2012).

In large group discussions, risk-taking may be involved when learners expressed their opinions and opened themselves to conceptual change (Lapadat, 2002). Thus, a safe and supportive environment was also created by the researcher since the affective filter hypothesis by Krashen (1985) has pointed out the need for it so that learners' filter was down and they can participate more actively and learn more effectively (please refer to *Section 2.2: The Role of Discussions in Second Language Acquisition* for more explanation). Thus, for online discussions, the researcher created an informal break area by posting welcoming message and encouraging learners to post socio-emotional responses or any topics they like during the briefing session (Rovai, 2007). The interactions on emotions, feelings and common interests can help to develop personal relationship and social presence (Garrison, Anderson & Archer, 2000; Rovai, 2007). According to Rovai (2007), creating these social-emotional discussions can also nurture a sense of community among the members and encourage more effective discussions.

Learners were also given the freedom to use their real names or their preferred nicknames during the online discussions. For the identification purpose, all participants wrote their usernames and their real names on another piece of paper which was kept by the teacher. For face-to-face discussions, learners were seated at a round table and the

teacher was seated at the far end and away from the round table. This was done in the hope to reduce learners' anxiety. Learners were also given the choice to pick their seats for face-to-face and online discussions. Even though a big group of 24 participants were involved, the face-to-face discussions went on smoothly. For learners' views of the group size, please refer to *Section 4.7: Group Dynamics, Processes and Development*.

A more complete account of the research design and method of this research can be studied in the following section.

3.6 Research Design/Method

There are three types of research methods which have their own strengths and weaknesses: quantitative, qualitative and mixed. For quantitative research which involves numerical units in the measurement of data, it is deemed to be more reliable and can usually be representative of a large population. It is suitable for evaluations, comparison and needs assessments. However, one of the weaknesses of quantitative approach is that it decontextualizes human behaviour as the event, setting and other variables are most often ignored.

Instead of emphasising on numbers or quantity, qualitative approach focuses on the quality so as to understand the social phenomenon from the respondents' perspectives, symbolic actions and observable behaviour. Attempts to discover ideas and knowledge are embedded in new data without having a priori hypotheses to guide and structure the inquiry process (Bilan, 1999). Though qualitative and quantitative research varies, they can complement each other (Nueman, 2003). For instance,

quantitative research method can afford accuracy for the collection and analysis of the data while qualitative approach can answer the questions of 'how' and 'why' in research.

When quantitative and qualitative approaches are combined, it becomes a mixed-method research which integrates the strengths of both approaches for higher accuracy data (Creswell, 2009). There are five purposes for conducting a mixed-method research (Greene, Caracelli & Graham, 1989). Firstly, it is for triangulating the data by checking if the findings from different instruments are consistent so that the threats that influence the results can be assessed or controlled. Secondly, a mixed-method research serves the function of complementarity as it illuminates and explains the findings from one method (e.g. experiment) with the use of another method (e.g. survey or interview). Thirdly, it helps to develop the findings from one method and form the following steps that are needed in the research process. Fourthly, it initiates new research questions or defies the findings of a method. Lastly, a mixed-method research can expand the study by providing rich details with the exploration using different methods.

For this study, a mixed-method design was utilised because the quantitative approach was found insufficient to answer the research questions because details like beliefs, opinions and experience were lacking. Thus, a mixed-method approach was employed so that the study can be more convincing and can afford broader understanding of the concerned issues than the quantitative or qualitative research (Creswell, 2009).

In this research, quantitative and qualitative data were collected concurrently from the quasi-experiment carried out. To further understand the explored issue, data were also gathered from the observation, survey and the online feedback session. The

concurrent transformative design that this study employed has given equal weighting for both quantitative and qualitative methods. Quantitative and qualitative data were gathered from the stages of data collection to data analysis and interpretation. The data collected through quantitative and qualitative approaches were integrated by comparing the counts in quantitative data to qualitative themes. This measure could also triangulate the data and give better support for the findings.

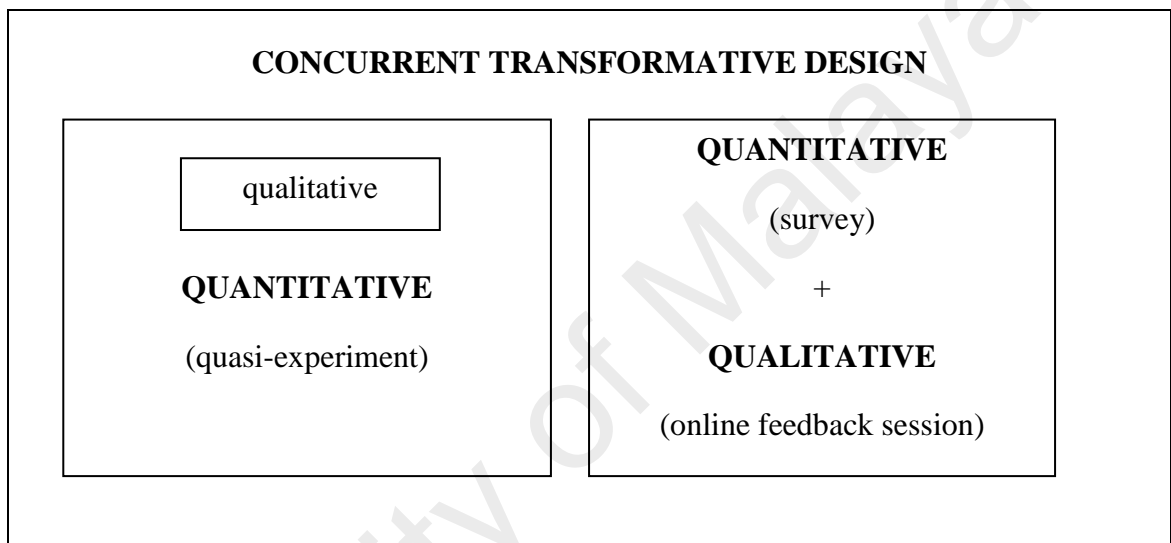


Figure 3.2: Concurrent Transformative Design (Creswell, 2009)

The research design of this study is as shown in Figure 3.2. The quasi-experiment carried out in this study is a quantitative design with qualitative methods embedded in it. During the experiment, the researcher observed and took note of the learners' behaviour. Then, the researcher analysed the transcripts of the quasi-experiment in a quantitative manner with the aid of IBM SPSS statistics 20 software and Wordsmith Tools (please refer to *Section 3.11.1: Quantitative Method*). After that, the transcripts and notes were analysed in a qualitative manner to identify interesting response from the participants to reveal more findings which were relevant to the research questions (please refer to *Section 3.11.2: Qualitative Method*).

After the experiment with four face-to-face discussions and four online discussions, a survey was administered (quantitative method) and the transcript of the online feedback session about the learners' preferences for discussion settings were analysed in a qualitative manner.

In this study, the two different discussion settings (face-to-face and online) were the independent variables while the dependent variables were the quantitative and qualitative measures of contribution of words, participation style, lexical complexity and interactive competence. The personality and language proficiency of the learners were the moderator variables; "a special type of independent variable which was used to find out how the relationship between the independent variables and dependent variables was affected, or modified, by the moderator variable" (Tam, 2009). The intervening variable which might impact the findings were eliminated through controlled variables such as gender, age, planning time, discussion topics, familiarity with the computer, keyboards and the Internet.

The procedure of this study is described in the following section.

3.7 Procedure

A day before the experimentation, an introductory session was held to introduce face-to-face and online discussions to the participants so that they were clear of what was expected of them. A consent form indicating the purpose of the study and schedule of discussions were also distributed (please refer to Appendix 6). During the session, the ESL learners learned to familiarise themselves with the system so that they could

participate effectively. They registered and learned the way to sign in and sign out from the online discussions. They were also given time to practise how to send and receive messages in an online discussion setting. Some learners may have had previous experience using the online discussion forum and thus more skilled in the online discussion. However, the briefing session was a platform for learners to gain the required skills to participate effectively in the discussions.

The venue for face-to-face discussions was at a meeting room of the participants' secondary school while the synchronous online discussions were held at a computer laboratory. Another computer laboratory next door was also booked for this study in case some of the computers could not function. All discussions lasted for 20 minutes; the same as Fitze (2006) which this study has adopted and adapted (please see *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*). This study has chosen to adapt Fitze's (2006) study because the research topic was important for a better understanding of the potential of online discussions and more importantly there was still a gap that the present study can fill in to provide more reliable findings with a focus on the learners themselves (please see *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*).

Both face-to-face and online discussions consisted of topic-oriented discussions on topics which were consistent with the themes in the curriculum specification of Form 4 English Language (please refer to Appendix 7). These themes have been chosen as they were of interest to the teenagers and appropriate with their cognition level (MOE, 2003).

The participation of the two ESL classes in different discussion settings was scheduled as in Table 3.3 below:

Table 3.3: Schedule for Discussions

Setting	Online	Face-to-face
Discussion 1 (Week 1)	Group A	Group B
Discussion 2 (Week 2)	Group B	Group A
Discussion 3 (Week 3)	Group A	Group B
Discussion 4 (Week 4)	Group B	Group A

Four observations were carried out in August with the two different groups alternating weekly from an online setting to a face-to-face setting according to the schedule in Table 3.3. The repeated measure was used to obtain more reliable findings for this study (Tam, 2009).

The topic of the discussion was only revealed to the learners two minutes before the discussion started. This is different from the study conducted by Fitze (2006) in which a written copy of the topic was given on the day before the discussions by the learners' different teachers (please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*). The teachers reviewed the topic to ensure that the learners understood the meaning and the vocabulary and were prepared for the discussions. However, this might influence the validity of Fitze's (2006) study since learners may have had different instructions and explanations from their respective teachers. In addition, pre-discussion and early information of the topic might influence learners' participation in discussions. This is presumed to be the reason why one of the groups in Fitze's study (2006) was found to have balanced participation in both online and face-to-face discussions while the other group did not (please see *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*). The participants

might have already prepared themselves in different ways. For example, the participants in Group A might have done a lot of research at the library after class while the participants from Group B were not bothered to do any research after class. The different types of preparation between the two groups could influence the discussions held on the next day. Thus, to avoid the preparation effect, this study only informed the learners of the topic just a few minutes before the discussions.

Before the discussions started, the participants were reminded of the time limit. They were told that they only had 20 minutes to discuss as a group. The time limit set was similar to Fitze's (2006), Warschauer's (1997) and Yanguas's (2010) study in which 15 – 20 minutes were allocated to both face-to-face and online discussions. These studies have found sufficient data to produce significant findings. A pilot test of the experiment with another group of seventeen-year-old Form 5 ESL students in 20 minutes has also found that the learners were able to finish the discussions within the time frame. Thus, this study set 20 minutes for discussions in both face-to-face and online environments.

During the discussion, the researcher monitored the process, took field notes and helped to rectify unforeseen problems such as technical difficulties, forgotten passwords and interruption. The focus of the field notes were the learners' behaviours and the environments of the discussions. The behaviours included the participants' actions which showed positive or negative attitude towards the discussions, the things that the participants did besides creating or receiving messages and the effectiveness of the discussion condition. These can be observed through the learners' facial expressions, gestures, length and type of messages. However, it should be noted that the learners' facial expressions and gestures were not analysed in detail in this study due to the large

group discussion setting. It was quite impossible to capture every facial expression and gesture of all the 24 learners who were sitting nearby with only a researcher observing the situation. Even though two video cameras were employed to record the discussions, there were still times when certain learners were blocked by their friends or hidden due to the position of the video camera. Thus, only prominent facial expressions and gestures were reported in this research. This is a limitation of the present study which has been discussed in *Section 1.7: Limitations of Study*. Despite that, the consequences of this limitation were limited as the main findings of this study came from the experiment and the observation was merely used to support the findings.

During the observation, the categories that the researcher worked with in the field notes were: the learners' positive attitude (e.g. laughter, smiles and nodding of the head), the learners' negative attitude (e.g. frown, smirks and pulling down the corner of the lips), the other actions performed by learners (e.g. gestures like moving the finger from left to right to indicate 'no' and other actions in addition to discussing the topic), the presence of possible interruptions or noise and the impact of the interruptions or noise.

When the discussions were about to come to an end after 15 minutes, the researcher reminded the participants that they only had about five more minutes and they could prepare for summing up and ending the discussions.

After the group went through two face-to-face and two online discussions, an online feedback session was created to enquire learners' preferences for face-to-face or online discussions. The questions asked were:

If you have experienced discussions through F2F and online, what is your comment on the two different discussion settings? Which one do you prefer and why? Any suggestions to improve?

The open questions above were asked to elicit varied response on the learners' preferences for a certain discussion environment, the advantages and limitations of face-to-face and online discussion settings and the ways to improve group discussions. Initial response was short but the teacher's intervention and subsequent exchanges improved the quality of the following feedback. The following excerpt is one of the examples:

*P23, Grp B to me...
 online discussion is good and effective...
Teacher P23, why do you think online discussion is better?
P23, Grp B I prefer online discussion because it's good and
 effective. Shy people normally afraid to discuss F2F
 because they don't have any confidence.*

This topic was posted online at the same website which was used to support the online discussions during the experiment. The questions were posted online so that the learners can have the opportunity to comment at their own time during the holiday. In addition, the interaction that may occur through the different feedback posted by different learners was also expected to elicit more response than the paper-pencil method.

Sadly, only two participants responded during the holiday even though more than 90% of them have access to the internet at home. When asked, the students claimed that they had forgotten and admitted that they were busy with celebrating *Hari Raya*. Thus the researcher gathered the participants according to groups so that they could comment on the questions which have been posted online. Even though the feedback was received one week after the last discussion they had, productive and informative comments were still able to be retrieved from the learners.

The participants' response in the online feedback session was transferred to a Word file and analysed in a qualitative manner. Since some participants might still find the open questions in the online feedback session to be a bother to answer, a survey which only required the participants to tick the column that best described their opinions to the given statements were also given (please refer to Appendix 8 and *Section 3.8.2: Survey on the Views of Face-to-face and Online Discussions*). This can triangulate the data and shed light on the participation style and discourse of the learners in different discussion environments.

In addition to answering the questions online, the participants were also given a survey to answer. Details of the survey can be read from the following section: *Instrumentation – Survey on the Views of Face-to-face and Online Discussions*.

3.8 Instrumentation

Before the quasi-experiment was carried out, the samples were selected based on Style Analysis Survey (SAS). This paper-pencil instrument was used to identify introverted and extroverted ESL learners so that their participation style and discourse in face-to-face and online discussions can be analysed.

After the experiment, a survey on the learners' view of face-to-face and online discussions was administered. The same with SAS survey, this survey was also a paper-pencil instrument. The instructions were read and responded in writing by the participants. Words that may be difficult to understand were also explained so that the

learners can respond accordingly. Further elaboration on these instruments is given in the following sections.

3.8.1 Style Analysis Survey (SAS)

Style Analysis Survey: Assessing your own learning and working styles which was developed by Oxford (1993) was used in this study due to its reliability and validity to this research.

Bascur (1994) has reported that the Style Analysis Survey (SAS) had a Cronbach reliability of .76 for all sections and the initial predictive validity studies showed significant relationships among the SAS survey, gender and academic major (the major field of study in an undergraduate programme). When tested with 468 language learners at a university in United States, the Cronbach's alpha was .87 (Akbulut (2007) and the total internal consistency reliability had an average of Cronbach's alpha coefficient of 0.89 (Cesur & Fer, 2009). The external reliability has also been examined to check the degree of consistency of the survey over time through test-retest and Pearson's correlations were significant at the 0.01 level with an average correlation of 0.64 which indicated acceptable external reliability (Cesur & Fer, 2009). The dimension which assessed extroversion and introversion (Activity 2) was also found to be significant and reliable with 0.70 criterion for Cronbach's alpha (Cesur & Fer, 2009; Psaltou-Joycey & Kantaridou, 2011). SAS survey can thus be considered as a reliable and user-friendly survey. It was used in this study to assess learners' personality (Akbulut, 2007; Bascur, 1994; as cited in Oxford, 1996; Cesur & Fer, 2009; Do'rnyci, 2005; Psaltou-Joycey & Kantaridou, 2011). Moreover, it was user-friendly (Do'rnyci,

2005) and more focused on language learning than other instruments (Cohen and Do˝rnyei, 2002).

3.8.2 Survey on the Views of Face-to-Face and Online Discussions

In this research, a survey on the views of face-to-face and online discussions was given to the learners (refer to Appendix 8) after they have gone through two face-to-face discussions and two synchronous online discussions. This was done to further understand the perceptions of learners towards the discussions carried out.

The questionnaire consisted of six parts; A - F. Section A gathered data of the participants' particulars, Section B addressed "Perceptions of English Language", Section C "Familiarity with ICT" and Section D "Reasons & Suggestions" elicited written responses to two open-ended questions about reasons of their preferred discussion settings and suggestions for improvement. The last section, Section E, contained 15 statements requiring numerical responses based on a five-point Likert-type response scale, ranging from the extreme responses of 'strongly agree' to 'strongly disagree'.

This survey as well as the other research methods has been pilot tested and the details are shown in the following section.

3.9 Pilot Testing

Pilot testing was conducted so that the unexpected can be expected and rectified for the research to be carried out more effectively. It was also done to assess and evaluate the instruments and methods of research.

Prior to the experiment, online discussions on the web-based bulletin board were integrated in the Form 5 English language classes which were not involved in this study. The problems that these seventeen-year-old learners faced when using the facilities were noted and relevant actions were taken. For instance, the computers which were not functioning were informed to the technician and fixed. Censorship of the website was also reported to the Information Management Division, Ministry of Education so that the censorship of the website can be removed and the school students were allowed to access the website that hosted the online discussions. Since many students complained about the code identification process during the registration for the online discussion forum website, this step was eliminated to reduce the time needed for successful registration.

Face-to-face discussions in the meeting room were also pilot tested with the seventeen-year-old Form 5 ESL students who were not involved in this study. A trial run of the face-to-face and online discussions found that 20 minutes were sufficient for the learners to finish discussing a topic. The face-to-face discussions were videotaped and problems with the recording process were noted. Since a video camera was found insufficient to capture the whole discussion setting, two video cameras were used during the experiment so that all the learners can be captured in the video. The students who

volunteered to take charge of the recording were also trained during the pilot test of the quasi-experiment.

Before the survey was administered, a pilot testing on the survey which investigated learners' views of face-to-face and online discussions was conducted. The first participant of the pilot testing was the researcher's colleague who was an experienced ESL teacher with an honours degree in the Bachelor of Education (Teaching English as Second Language). She has taught English Language to the Form 4 and 5 ESL students for more than ten years. Substantial feedback was given by her on the design of the questionnaire and choice of words. From the comments, layout was modified and simpler vocabulary was used. The meanings of the words that may be unfamiliar to the ESL learners were also written beside the words and in brackets. For example, in item number 6 of Section E, *I feel I am more of an extrovert (outgoing type) than an introvert (quiet/shy type)*, the explanations of *extrovert* and *introvert* were indicated in the brackets. The second participant of this pilot testing was a Form 5 ESL learner. She has also given valuable feedback that could increase the ease of the understanding of the questionnaire. Some sentences were rephrased and made simpler. For instance, in item number 13 of Section E, the original statement *I find the computer lab to be a conducive place for online discussions* was changed to *The computer lab is a suitable place for online discussions*.

From the pilot tests, the experience and comments gathered were used to improve the effectiveness of the actual research. The ways the data of this research were collected and recorded is explained in the next section.

3.10 Data Collection and Recording

3.10.1 Quasi-Experiment & Observation

In online discussions, all the exchanges in forum-motion.com and the senders' information as well as the order of the sent messages were saved in a word-processing file. The names of the students were changed to numerical codes to protect their anonymity. However, for face-to-face discussions, the process was videotaped and transcribed in Word document for analysis. Similar to the online discussions, the names of the students who have spoken and the order in which the comments were uttered were transcribed with their names substituted with numerical codes.

Spelling mistakes were corrected so that it would be consistent with the spelling in the transcription of face-to-face discussions. This could also avoid the wrongly spelled and non-standard words from flawing the analysis of the discourse displaying lexical complexity. If a spelling error was allowed, it might be wrongly analysed as a unique word even though it was actually a misspelled form of a token already used repeatedly (Fitze, 2006).

During face-to-face discussions, the participants were encouraged to speak in English language as much as possible since the focus of this study was on English language discourse. When a word or a phrase of a sentence was code-switched, the sentence would still be considered as a t-unit. According to Hunt (1965), t-units are "the shortest grammatically allowable sentences into which (writing can be split) or minimally terminable unit" (pg.20). In other words, a t-unit is basically an independent

clause which must have a verb and may be joined with one or more dependant clauses. (Hunt, 1965).

However, in calculating lexical complexity, the words which were not in English language were not regarded as a unique word. It should be noted that the focus of this study was not on code switching. In addition, to ensure the reliability of the lexical range analysis, the consecutive repetition of the same word for a few times when a student stuttered would also be dropped (Fitze, 2006). For instance, the number of words in the sentence *I., I ... I think that she is right* consisted of only six words; the repetitions of *I* was not counted.

Also, when a student was not present at the discussion, her scores were left blank in the analysis for that week. This was done to avoid confusion of absentees with students who made no contribution while being present at the discussion.

After gathering the data from the experiment, the videotaped face-to-face discussions were transcribed by the researcher and cross-checked by two selected participants. The participant-as-transcriptionist method was considered effective and reliable (Grundy, Pollon & McGinn, 2003). This is because the transcriptionists were involved in the discussions and thus would be better to make out what was being said in the video given that they knew the context and this can increase the accuracy and validity of the transcripts (Easton, Fry McComish & Greenberg, 2000; Grundy, Pollon & McGinn, 2003). The transcripts would also be closer to the participants' experience and is believed to be better than employing someone who was not involved in the discussions (Easton, Fry McComish & Greenberg, 2000; Grundy, Pollon & McGinn, 2003). In this study, the participants who were proficient in English language and active

during the discussion were chosen to assist in checking and editing the transcription of the researcher based on the recorded videos. The transcriptions of both online and face-to-face discussions were transferred to a word-processing file for further analysis.

The observation of the learners' behaviour during the experiment was jotted down on a notebook and transferred to a word-processing file (please refer to *Section 3.7: Procedure* for details on the behaviours observed). These field notes were referred to when discussing relevant themes and findings. For the survey questionnaire and online group discussion, the way the data were collected and recorded is explained in the following section.

3.10.2 Survey Questionnaire & Online Feedback Session

The data collected from the survey on the views of face-to-face and online discussions was transferred to an Excel file for analysis. The participants' names were changed to numerical codes to protect their anonymity. For the online feedback session, all the exchanges in the website *Learning English in an Interactive Way* and the senders' information as well as the order of the sent messages were saved in a word-processing file. The participants' names were also changed to numerical codes.

The way the data are analysed is explained in the following section.

3.11 Data Analysis

3.11.1 Quantitative Method

The data collected from the experiment and the survey was analysed in a quantitative manner. A second rater who was the researcher's colleague was employed to categorise the various language functions for research question 4 and to check the calculations for all the research questions. The employed second rater was an experienced ESL teacher with an honours degree in the Bachelor of Education (Teaching English as Second Language) who has worked in the secondary school for more than ten years. The researcher and the second rater worked independently and the inter-coder reliability was between 90% and 98% on the following tasks: counting the number of words, finding out the number of unique words, analysing the transcripts into t-units and categorising the t-units which displayed interactive competence according to Chun (1994).

For the data gathered from the experiment, the analysis of data is explained according to the research questions. For the first research question, the total number of words produced by the participants in each discussion setting during the experiment was calculated to find out if the introverted and extroverted learners who had different levels of language proficiency were likely to generate more discourse in a face-to-face or online environment given the same amount of time for discussion. Using IBM SPSS statistics 20 software, a paired-samples t-test on the total number of words produced in different discussion condition (online and face-to-face) was run and then compared. After that, the paired-samples t-test was run a few times on different groups:

1) the groups with different personalities

- introverts

- extroverts

2) the groups with different levels of language proficiency

- high-intermediate

- low intermediate

3) the groups with different personalities and proficiency level

- introverts with high-intermediate language proficiency

- introverts with low-intermediate language proficiency

- extroverts with high-intermediate language proficiency

- extroverts with low-intermediate language proficiency

When more discourse was produced in one of the discussion settings or for one of the groups, the percentage of increase in the token of words was calculated. The results of the findings were filled into the following tables: Tables 3.4 to 3.7.

Table 3.4: Comparison of Total Words across Discussion Settings

Discussion	Number of Words	
	Online	Face-to-face
1		
2		
3		
4		
Mean		
Standard deviation		

Table 3.5: Comparison of Total Words for the Extroverts and Introverts across Discussion Settings

Discussion	Number of Words			
	Online		Face-to-face	
	<i>Introverts</i>	<i>Extroverts</i>	<i>Introverts</i>	<i>Extroverts</i>
1				
2				
3				
4				
Mean				
Standard deviation				

Table 3.6: Comparison of Total Words for High-Intermediate and Low-Intermediate ESL Learners across Discussion Settings

Discussion	Number of Words			
	Online		Face-to-face	
	<i>High-intermediate</i>	<i>Low-intermediate</i>	<i>High-intermediate</i>	<i>Low-intermediate</i>
1				
2				
3				
4				
Mean				
Standard deviation				

Table 3.7: Comparison of Total Words across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency

Discussion	Number of Words							
	Online				Face-to-face			
	<i>Introverts</i>		<i>Extroverts</i>		<i>Introverts</i>		<i>Extroverts</i>	
	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>
1								
2								
3								
4								
Mean								
Standard deviation								

(Note: Due to space constraints, the categories for high-intermediate and low-intermediate ESL learners are shortened to 'high' and 'low' respectively)

With regard to research question 2, the number of words produced by each student was calculated to see if the participation of the larger groups of students in online discussions would show more balanced participation in face-to-face or online environments. Then, after obtaining the participation percentage per student, the number of words written by each student during each discussion setting was used to calculate gini coefficients of inequality (please refer to Appendix 3 for details) for each type of discussion. The gini coefficients were obtained through the website *Free Statistics and Forecasting Software* (Wessa, 2012). In the website, participation percentage of different groups of learners was keyed in at the data box provided and gini coefficients were calculated automatically after pressing the ‘compute’ button. Figure 3.3 shows the table for entering the data (participation percentage) and the table which shows gini coefficient.

The screenshot shows a web-based interface for calculating the Gini coefficient. It features a 'Send output to:' section with a dropdown menu set to 'Browser'. Below this is a 'Data:' section with a list box containing the values 80, 60, 10, 20, and 30. A 'Compute' button is located below the data list. At the bottom, a table displays the results of the calculation.

Concentration - Ungrouped Data	
Gini Coefficient	0.360000

Figure 3.3: Calculations of Gini Coefficient

After obtaining the gini coefficients for the different groups of learners in different discussion environments, a paired-samples t-test on the totals for the different groups and discussion condition was run and compared using IBM SPSS statistics 20

software. After that, the results were recorded in tables which were the same as Tables 3.4 – 3.7 but with a difference in the labels; “total words” was changed to “equity of participation”.

To determine if the lexical complexity differed between face-to-face and online discussions (research question 3), the standardised type-token ratios for the ESL learners in different discussion conditions was calculated. Standardised type-token ratios can be computed by finding out the ratio of unique words (types) to the total number of words for the first x words and then the next x words (tokens) until the end of the transcript. Estimating that the transcripts of both types of discussions could range from 1000 to 3000 words, 100 word intervals (i.e. $x = 100$) was used as a basis when calculating the standardised type-token ratios of the discussions. The term *unique words* in this study referred to words which were not the same and further explanation can be found at *Section 1.9: Definition of Terms*. The mean of the ratios was noted as the standardised ratio (Scott, 1998).

In this study, standardised type-token ratio was obtained with the use of Wordsmith Tools software. To obtain the standardised type-token ratios using this software, the contributions of the different types of learners were first saved in different Word documents. For instance, the words produced by the high-intermediate ESL learners in different discussions were selected from the discussion transcripts and copied to a new Word file. After that, Wordsmith Tools was run to get the word list. The statistics from Wordsmith Tools revealed the standardised type-token ratios; as shown in Figure 3.4.

	N	Overall	1	2	3	4
text file		Overall	D1f2fHP.txt	d1f2fLP.txt	D1on9HP.txt	D1on9LP.txt
file size		82,242	5,447	3,534	6,117	3,545
tokens (running words) in text		15,135	1,024	678	1,086	650
tokens used for word list		15,136	1,024	679	1,086	650
sum of entries						
types (distinct words)		1,764	279	228	353	261
type/token ratio (TTR)		11.65	27.25	33.58	32.50	40.15
standardised TTR		66.79	62.20	62.17	71.40	68.83
standardised TTR std.dev.		33.35	33.71	33.57	26.26	24.25
standardised TTR basis		100	100	100	100	100
mean word length (in characters)		4.13	3.99	3.93	4.22	4.03
word length std.dev.		2.23	2.13	2.03	2.19	2.04
sentences		820	59	40	56	33
mean (in words)		18.46	17.36	16.98	19.39	19.70
std.dev.		25.14	20.51	13.96	36.71	25.43
paragraphs		16	1	1	1	1
mean (in words)		946.00	1,024.00	679.00	1,086.00	650.00
std.dev.		585.49				
headings						
mean (in words)						
std.dev.						

Figure 3.4: Standardised Type-Token Ratio

A paired-samples t-test on the standardised type-token ratios for the different groups and discussion condition was then run and compared. The results were filled in the tables which were the same as Tables 3.4 – 3.7 but with a change in the labels; “total words” was changed to “standardised type-token ratios”.

To discover if the interactive competence displayed by the ESL learners were different when they interacted in face-to-face or online settings (research question 4), the entire conference contributions was firstly analysed into t-units. In the online discussions of this study, a t-unit was “defined as a comment made by a participant, up to one t-unit in length, concluded by the participant pressing the send key” (Fitze, 2006). Similarly, a t-unit in face-to-face discussions consisted of “single conversational turn taken by a participant up to one t-unit in length” (Fitze, 2006). In both face-to-face and online discussions, the transcripts were not manipulated when the contributions were

the same or shorter than a t-unit. However, when the contributions were longer than a t-unit, the main clause was divided into consecutive t-units produced by the same learner.

Then, the participants' discourse was coded in a similar way like Chun (1994) and Fitze (2006). To find out if participants in this study would show different levels of competency in their interactions in either one of the discussions settings, t-units were coded for the discourse which showed interactive competence. A t-unit would be regarded to be displaying interactive competence when it has completed one of the language functions below (Chun, 1994; Fitze, 2006):

- 1) Provides or requests clarifications for the subject or task
- 2) Requests clarifications through statements or questions
- 3) Provides response to the other participants without substantiating it (e.g. "yes", "perhaps", "I don't agree")
- 4) Statements for social purposes (e.g. greetings, thanks, apologies, farewells)
- 5) Meta-communications: admonitions, invitation for participation, expression of feelings (interest, boredom. etc) about the discussion/topic, redirection to topic.

The percentage of t-units which displayed one of the language functions mentioned above was counted and calculated as the mean of the total number of t-units displaying interactive competence in a particular type of discussion. The mean was then compared with the other discussion setting. After that, a paired-samples t-test on the totals for the different groups and discussion condition was run and compared. The findings were recorded in tables which were the same as Tables 3.4 – 3.7 but with a difference in the labels; "total words" was changed to "the percentage of t-units displaying interactive competence".

For the data gathered from the survey on the views of face-to-face and online discussions, the mean of the twenty statements which portrayed learners' background, experience, views and attitudes towards face-to-face and online discussions were calculated (please refer to *Section 3.8.2: Survey on the Views of Face-to-Face and Online Discussions*). The results were then used to support the discussion of the differences and similarities of the extroverted and introverted learners' participation style, lexical complexity and interactive competence in face-to-face and online discussion settings. It should be noted that the findings from the survey were not intended to answer the research questions of this study directly. Instead, the questions in the survey elicited more information about the learners' backgrounds, preferences, experience and views of the discussion environments so as to provide more insights to the area of interest in this study. The findings from the survey also aimed to triangulate the data and provide more information about the learners and the settings for a more comprehensive and interesting discussion.

The next section explains the qualitative research method used in this study.

3.11.2 Qualitative Method

The researcher's observation of the discussion process, the participants' responses during the experiment and their comments in the survey and online feedback session were compared and analysed with the aim of finding common themes about the ESL learners' participation styles and use of language; specifically lexical complexity and interactive competence in different discussion settings. To that end, the grounded theory's constant comparative and inductive method of analysis strategies method was used.

The grounded theory's constant comparative and inductive method of analysis can allow initial hypothesis to be developed from the data that were empirically grounded (Corbin & Strauss, 2008; Strauss & Corbin, 1990). In this study, detailed descriptions which illustrated the participation style, lexical complexity and interactive competence of the ESL learners during online and face-to-face discussions were highlighted from the field notes, online feedback session, the transcriptions of the discussions and comments given in the survey.

With the use of open coding and axial coding strategies, the categories emerged from the data and hypotheses can be formed from the similarities and differences. During the process of open coding, themes were identified, named, categorised and the phenomenon was described. Following that was the process of axial coding in which connections among the categories and subcategories were formed. As an example, during the open coding process, the following responses by the learners on their reasons for choosing face-to-face discussions were grouped under the theme of *confidence*.

- P1, Grp A : can increase my self-esteem and confidence when speaking in English*
P2, Grp A : gain confidence to speak out our ideas
P9, Grp A : build my confidence level to speak in front of people although this is quite hard for me

After that, the category of *confidence* was linked to the subcategory of *shyness* during the axial coding process. For example, the following response by Participant 22 from Group A (P22, Grp A), which was categorised under the subcategory of *shyness* was connected to the theme of *confidence* as she showed that her shy personality has influenced her confidence to speak in front of people.

- P22, Grp A : some students shy when they talk in front of the audience—feel nervous and scared*

The second rater who helped the researcher with research question 4 (please refer to *Section 3.11.1: Quantitative Method*) was also employed to identify the categories and subcategories. The researcher identified 30 nodes which matched with the second rater's 33 nodes. The inter-reliability or the percent of agreement between the raters was 91%. After identifying the themes, the researcher and the second rater worked together in naming and forming connections among the categories and subcategories. The next section explains the use of triangulation in this study.

3.12 Triangulation

Triangulation refers to the combination of methodologies for the research of a phenomenon. When the consistency of the findings is tested through triangulation, the credibility of the findings and the quality of the research can be ensured (Bailey, 1996).

In this study, the findings were triangulated using different instruments. The main instrument was the quasi-experiment which involved two groups of 24 learners participating in the online and face-to-face discussions. Observation of the learners' behaviours were also carried out during the discussions. After the discussions, an online feedback session was held to enable learners to provide detailed and meaningful data to the findings obtained from the quasi-experiment and observation. During this session, the researcher was able to clarify matters and gain more understanding of the subject area. A survey on the views of face-to-face and online discussions was also administered to the participants so as to obtain more precise data about the learners' background and their views of the effectiveness of the different discussion settings.

From the data collected, the participants' answers to the questions in the survey and online feedback sessions were compared and contrasted with the learners' interactions and behaviours during the face-to-face and online discussions. These triangulating evidences were hoped to bring about a more accurate and insightful findings for this study.

After looking at the use of triangulation in this study, the next section describes the external and internal validity of this research.

3.13 External and Internal Validity

In this study, the discussion setting should be the only independent variable of interest. Other possible variables such as students' level of proficiency, number of students and weeks of research were controlled. Apart from that, the researcher has also tried to create similar experiences to both classes. The discussion process was also constantly reviewed for improvements.

Since a relatively small sample was involved in this research, the results of this exploratory study may only be applicable to students of similar group undergoing similar conditions due to its limits in external validity. Apart from that, threats to internal validity such as practice effect can be foreseen when students gained experience and skills through their participation in the discussions. The practice effect was predicted to grow over the four discussions in the different settings. The other factor that might influence the internal validity was the videotaping of the learners. The learners may feel shy or inhibited as they were aware that they were observed and

recorded. However, the researcher has told the learners that the recording was solely for research purposes and she would not reveal to other parties.

Topic effect might also influence the internal validity as the topics chosen may be less or more motivating to students. However, as each topic may be equally less or more interesting for students in both classes having the same discussion at the same week, it should not have much effect on the validity of this study which focused on the comparison of discussion settings.

3.14 Flow Chart of the Methodological Procedure

The methodological framework of this study is shown in Figure 3.5. The first stage of this research was to select 24 extroverted and 24 introverted ESL learners with high-intermediate and low-intermediate language proficiency from a secondary school where the researcher worked at. The personality and language proficiency of the learners were controlled during the selection process. The learners' personality was determined from the *Style analysis survey: Assessing your own learning and working styles* (Oxford, 1993) while the language proficiency of the learners was based on their scores for mid-year exam and school-based oral assessment.

The second stage of the research was to brief all the participants about the research process. During the briefing session, the learners registered themselves at the website which supported the online discussions and practised sending messages online. The learners were told of their roles during the experiment and were given a notice about the aim of the research and the schedule for discussions (please refer to Appendix 6).

The third stage involved two groups of participants. Each group participated in two online discussions and two face-to-face discussions. The discussions were held weekly with the researcher playing the role of a facilitator and observer.

After gathering the data from the experiment, the videotaped face-to-face discussions were transcribed by the researcher and cross-checked by two selected participants. Then, the transcriptions of both online and face-to-face discussions were transferred to a word-processing file for further analysis.

The data were also triangulated using two other instruments: a survey and an online feedback session. The survey was administered to the participants to gather more precise data about the learners' background and their experience, views and attitudes towards face-to-face and online discussions. On the other hand, the online feedback session was created for the participants to express their views of the discussion settings and provide suggestions for improvement.

After the data collection process, the data from the quasi-experiment were analysed using SPSS software and Wordsmith Tools to observe for any relationship between the personality and language proficiency of the participants and their participation style, lexical complexity and interactive competence in face-to-face and online discussions. The participants' interactions and behaviours during the online and face-to-face discussions as well as their responses in the survey and online feedback session were also analysed to identify the reasons behind their preferences for certain discussion settings.

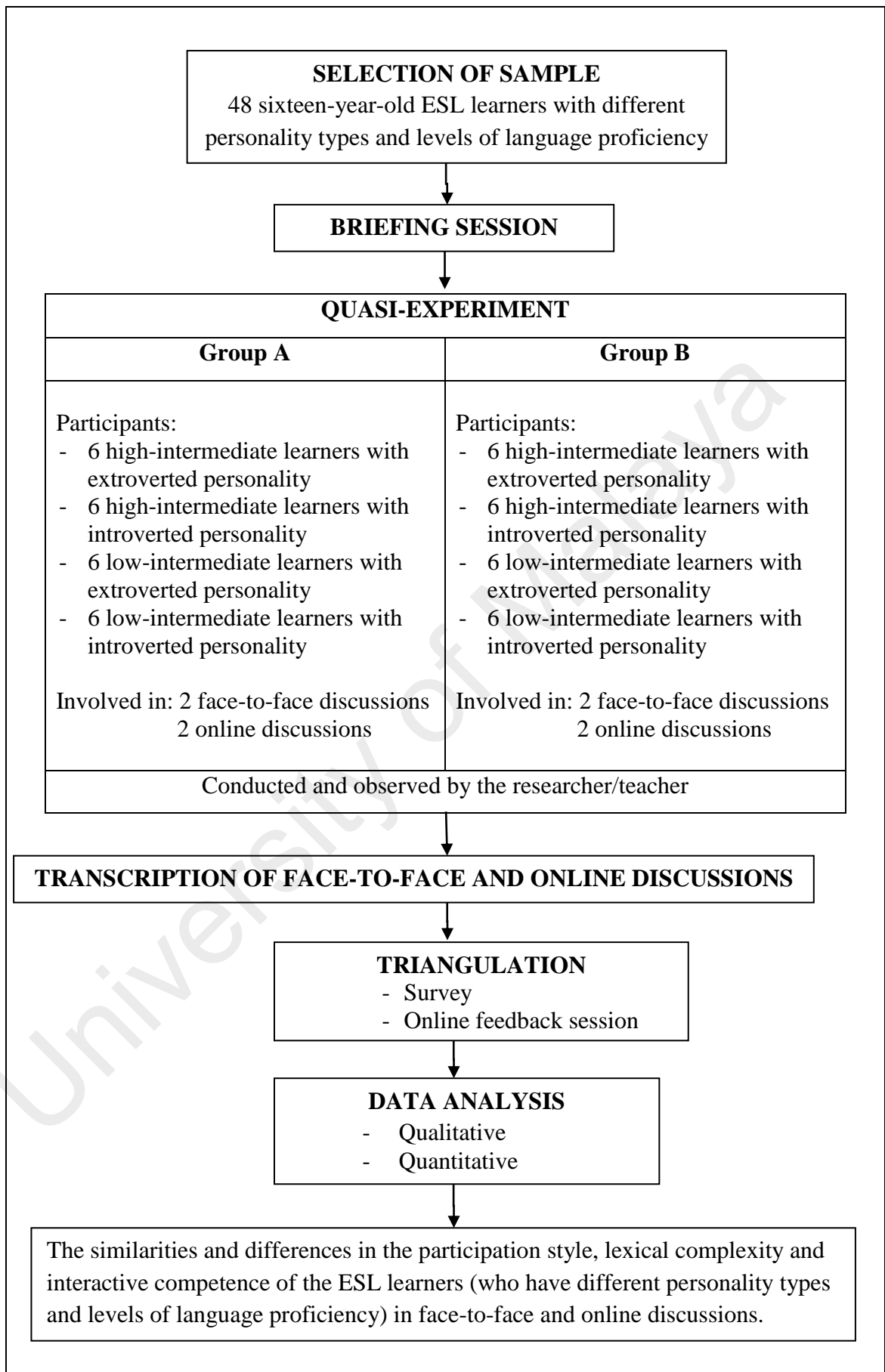


Figure 3.5.: Methodological Framework

3.15 Conclusion

To conclude, this chapter has explained the theoretical framework that guides this research and provided information about the setting, participants, research design, procedures, instrumentation and the way data were collected and analysed. Measures to ensure the reliability and validity of this study have also been reported.

All in all, the design and method for this research have been carefully selected to answer the research questions. The quasi-experiment, survey and online feedback sessions have been successfully carried out to aid the researcher in answering the research questions. The findings are reported and discussed in the following chapter.

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CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Overview

This chapter presents the findings and discusses the results obtained through a mixed-method approach. The main objective of this study is to compare and contrast synchronous online discussions and face-to-face discussions quantitatively and qualitatively to examine the effectiveness of computer-assisted interactions in assisting the ESL learners to communicate actively and effectively.

This study employed Foulger's (2004) *Ecological Model of the Communication Process* to investigate the relationship among learners, language and media during the creation and consumption of messages (please refer to *Section 2.4.6: The Ecological Model of Communication* for details). In this study, the language produced (lexical complexity and interactive competence) and the participation style of the ESL learners in different media (online and face-to-face settings) was investigated. In addition, this study also looked into the variables such as learners' personality (extroversion and introversion) and language proficiency (high-intermediate and low-intermediate).

Forty-eight female students (two groups) from a secondary school have been selected to participate in this study. Each group comprised of twelve extroverts with six of them having high-intermediate proficiency and another six having low-intermediate proficiency and twelve introverts with six having high-intermediate proficiency and

another six having low-intermediate proficiency. Each group participated in two face-to-face discussions and two online discussions. The participants' performance during the discussions and their feedback of the discussions were analysed to answer the research questions of this study. The research questions of this study are reviewed in the following section.

4.2 A Review of the Research Questions

A mixed-method approach was used in the analysis of ESL learners' participation style, lexical complexity and interactive competence. For the quantitative analysis of the results, the methods employed by Warschauer (1997) and Fitze (2006) in comparing synchronous online discussions and face-to-face discussions were adapted (please refer to *Section 3.7: Procedure* and *Section 3.11.1: Quantitative Method* for more information). On the other hand, the qualitative analysis of this study was based on the grounded theory's constant comparative and inductive method of analysis strategies method (please see *Section 3.11.2: Qualitative Method* for details).

The results and discussions of the data gathered from the experiment, observation, survey and online feedback session aimed to answer the research questions as follows:

- 1: Given the same amount of time for discussions in face-to-face and online settings, how do the contributions of the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) differ?

2: What type of participation style is shown by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) in face-to-face and synchronous online discussions?

3: What is the difference in the lexical complexity displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

4: What is the difference in the interactive competence displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

When reporting the answers to the research questions of this study, the findings of the quantitative data (from the experiment) were presented before the qualitative data (from the discussion transcripts, observation, survey and online feedback session). To arrive at the findings, the effects of the learners' personality and language proficiency were examined to provide a better view of how learners' individual differences can impact on their discourse and participation style in different discussion settings. The influence of group dynamics, processes and development was also identified and reported. After that, the general findings from the different methods used (quasi-experiment, survey on the views of face-to-face and online discussions, observation and online feedback sessions) were reported before making conclusion.

4.3 Contribution of Words

Research question 1:

Given the same amount of time for discussions in face-to-face and online settings, how do the contributions of the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) differ?

This section looks at the number of words contributed by the ESL learners who have different personality types and levels of language proficiency in different discussion settings. The number of words contributed by the learners signifies the learners' willingness to interact (Duff, 1986; Tam, 2009; van Lier, 1988). This means that the more number of words produced by the learners shows the more willing they are to communicate and thus higher chances for exposure to comprehensible input, comprehensible output, noticing of form and SLA (please refer to *Section 2.2: The Role of Discussions in Second Language Acquisition* for further explanation).

This research also looks at the number of words produced by different groups of learners because it can help with the discussions of the following research questions which are related to the learners' participation style and discourse which display lexical complexity and interactive competence. When the findings reveal that the learners' participation is imbalanced in face-to-face discussions, the total words produced by different learners can give an indication of the type of learners that has dominated the discussions. Apart from that, different types of learner's might show different levels of lexical complexity and interactive competence. The total number of words produced can also give an indication whether the learners' discourse which show lexical complexity

or interactive competence is proportionate to the number of words produced. Thus, looking at the number of words produced by different types of learners can provide more insights to the findings for the following research questions.

To answer the first research question, a quantitative approach with the use of IBM SPSS Statistics 20 software was run to compare the number of words produced by different group of learners. Following that, the themes which explain the results of the quantitative analysis are reported. The explanation of the results is as follows.

4.3.1 Quantitative Analysis

In this study, face-to-face and online discussions were both carried out twice on two matched-samples groups (Group A and Group B) according to the schedule for discussions in *Table 3.3: Schedule for Discussions*. Each group experienced two face-to-face and two online discussions. While one of the groups was participating in a face-to-face discussion, the other group was involved in an online discussion. Both groups discussed on the same topic given by the teacher/researcher in the same week.

To evaluate the effect of the discussion environments on students' contribution of words during the discussions, the total number of words contributed by the ESL learners for each setting in the 20-minute discussion was obtained and a paired-samples t-test using IBM SPSS Statistics 20 software was conducted on the totals by discussion condition (please refer to *Section 3.11.1: Quantitative method* for the methodology). The totals are presented in Table 4.1; group is indicated in parenthesis.

Table 4.1: Comparison of Total Words across Discussion Settings

Discussion	Number of Words	
	Online	Face-to-face
1	1733 (Group A)	1692 (Group B)
2	1801 (Group B)	1466 (Group A)
3	1600 (Group A)	1728 (Group B)
4	2903 (Group B)	1999 (Group A)
Mean	2009.25	1721.25
Standard deviation	601.65	218.48

The test on total number of words in the discussions showed no statistically significant main effect across discussion settings, $t(3) = 1.27$, $p > 0.05$ (two-tailed). In other words, the total number of words contributed by the students was not found to differ between the online ($M = 2009.25$, $SD = 601.65$) and face-to-face ($M = 1721.25$, $SD = 218.48$) settings. This result is similar to Fitze (2006) which also showed no statistically main effect across the settings, $t(3) = -1.13$, $p > 0.05$ (two-tailed) even though the mean of the online discussion was slightly higher than the face-to-face discussion (please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*).

In this study, the difference in the means for total words between the two types of discussions was 288 words, a 14% and 16.7% of the total words in online and face-to-face discussions respectively. This shows a higher percentage to Fitze's study (2006) which only found 5.7% and 5.4% difference in the means for total words in the online and face-to-face discussions respectively. The total number of words was also found higher in online discussions for discussions 1, 2 and 4. This suggests that the students tend to produce a larger number of words in the online settings. This finding differed from Fitze (2006) who found that students did not consistently produce a larger number of words in one type of discussion setting (please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*).

However, it should be noted that the findings by Fitze (2006) may be affected by the intervening variable of group differences. This is because Group B in his study was found to contribute more total number of words than Group A in all the four discussions (two face-to-face discussions and two online discussions) irrespective of discussion settings. Thus, the findings by Fitze (2006) which claimed that learners did not consistently produce more words in one type of discussion settings may not be convincing and did not hold true in this study. On the contrary, this study has selected matched participants for Group A and Group B with regards to their personality and language proficiency and found that the ESL learners generally produced more words in online discussions even though there was no statistically significant difference. The influence of the learners' personality and language proficiency in influencing their contribution of words in different discussion settings is explained in the following sections.

As found in this study, the ESL learners contributed larger number of words in online discussions than in face-to-face discussions even though the difference was not statistically significant. This shows that the synchronous online discussion setting also has the capability that a face-to-face environment has in providing a conducive environment for discussions; a useful activity for second language learning (please refer to *Section 2.2: The Role of Discussions in Second Language Acquisition* for details)

4.3.1.1 The Influence of Learners' Personality

To evaluate the effect of students' personality on the contribution of words in different discussion environments, a paired-samples t-test was conducted on the total

number of words produced by the extroverts and introverts. The totals are presented in Table 4.2; groups are indicated in parenthesis.

Table 4.2: Comparison of Total Words for the Extroverts and Introverts across Discussion Settings

Discussion	Number of Words			
	Online		Face-to-face	
	<i>Introverts</i>	<i>Extroverts</i>	<i>Introverts</i>	<i>Extroverts</i>
1	877 (A)	856 (A)	508 (B)	1184 (B)
2	834 (B)	967 (B)	55 (A)	1411 (A)
3	462 (A)	1138 (A)	254 (B)	1474 (B)
4	1070 (B)	1833 (B)	42 (A)	1957 (A)
Mean	810.75	1198.50	214.75	1506.50
Standard deviation	254.14	438.62	218.25	325.13

The paired-samples t-test from the IBM SPSS Statistics 20 software found a statistically significant difference in the total number of words produced by the introverts and extroverts in face-to-face discussions, $t(3) = -5.08$, $p < 0.05$ (two-tailed). The magnitude of the differences in the means (mean difference = 1291.75, 95% CI: 482.02 to 2101.49) was very large (eta squared = 0.93; eta squared is a measure of effect size or strength of association). In other words, the extroverts' contribution of words in face-to-face discussions ($M = 1506.50$, $SD = 325.13$) was much more than the introverts ($M = 214.75$, $SD = 218.25$). However, in online discussions, no significant difference in the total number of words was produced by the introverts and extroverts, $t(3) = -1.99$, $p > 0.1$ (two-tailed).

There was also a statistically significant difference in the number of words produced by the introverts during online ($M = 810.75$, $SD = 254.14$) and face-to-face discussions ($M = 214.75$, $SD = 218.25$), $t(3) = 3.18$, $p = 0.05$ (two-tailed). The mean difference was 596.0 with a 95% confidence interval ranging from -0.929 to 1192.93.

The eta squared statistics (.83) indicated a large effect size. This showed that the introverts produced significantly more words in an online setting than in a face-to-face environment. This is in line with Whitworth's (2009) postulation that the introverts who are usually more timid can experience the target language better when they are in the less face-threatening acts in an online environment.

On the other hand, the extroverts produced more words when they were in face-to-face discussions ($M = 1506.50$, $SD = 325.13$) than when they were online ($M = 1198.50$, $SD = 438.62$). A statistically significant difference in the number of words produced was found, $t(3) = -4.61$, $p < .005$ (two-tailed). The mean difference was 308.0 with a 95% confidence interval ranging from 95.43 to 520.57. The eta squared statistics (.91) indicated a very large magnitude in the difference of words contributed by the extroverts in face-to-face and online discussions. The difference could be related to the personality of the learners. The extroverts were generally more active around people and tend to speak whatever they were thinking (Naik, 2010). On the other hand, the introverts were usually more reserved, deep in reflection and easily felt nervous in a large group (Naik, 2010). The low contribution of words by the introverts could have also caused the extroverts to contribute more to the discussions so as to avoid silent or awkward moments.

From the findings on the total number of words produced by the introverts and extroverts, the online environment appeared to be less threatening and students especially the introverts can ponder longer and can contribute more words to the discussion (Hamat, 2008; Whitworth, 2009). On the other hand, the face-to-face environment caused more anxiety among the introverts as immediate response from them was anticipated (Hamat, 2008; Jonassen, 1994; Whitworth, 2009). The findings

from the qualitative analysis (please refer to *Section 4.3.2.1: Confidence*) also showed that the introverted learners were indeed less confident in face-to-face discussions as they described themselves to be nervous, awkward and scared when interacting with a large group of people in face-to-face condition.

Another reason why more words were contributed by the introverts in online discussions was that the learners must express their attitudes such as agreement, curiosity and boredom explicitly in online discussions and cannot rely on paralinguistic cues as in face-to-face discussions (Kiesler et al., 1984).

For the extroverts who were more confident of themselves, they were found to be able to contribute to the discussions in both face-to-face and online discussions. This is because they were more adventurous in trying the target language (Kow, 2012). However, there might be some differences in the contribution of words among the extroverts who have high-intermediate language proficiency and those who have low-intermediate language proficiency. The influence of learners' language proficiency will be investigated in the following section.

4.3.1.2 The Influence of Learners' Language Proficiency

To find out if the students' language proficiency affect their production of words in different discussion environments, a paired-samples t-test was conducted on the total number of words contributed by the extroverts and introverts. The totals are presented in Table 4.3; groups are indicated in parenthesis.

Table 4.3: Comparison of Total Words for High-Intermediate and Low-Intermediate ESL Learners across Discussion Settings

Discussion	Number of Words			
	Online		Face-to-face	
	<i>High-intermediate</i>	<i>Low-intermediate</i>	<i>High-intermediate</i>	<i>Low-intermediate</i>
1	1091 (A)	642 (A)	999 (B)	693 (B)
2	1176 (B)	625 (B)	1464 (A)	2 (A)
3	959 (A)	641 (A)	1363 (B)	365 (B)
4	1935 (B)	968 (B)	1980 (A)	19 (A)
Mean	1290.25	719	1451.5	269.75
Standard deviation	439.01	166.18	404.99	328.01

The paired-samples t-test from the IBM SPSS Statistics 20 software revealed a statistically significant difference was found in the total number of words produced by the high-intermediate and low-intermediate ESL learners in both online and face-to-face settings. In online discussions, the total number of words produced by the high-intermediate learners ($M = 1290.25$, $SD = 439.01$) were much higher than the low-intermediate learners ($M = 719$, $SD = 166.18$). The difference was statistically significant, $t(3) = 4.07$, $p < 0.05$ (two-tailed) and the magnitude of the differences in the means (mean difference = 571.25, 95% CI: 124.85 to 1017.65) was very large (eta squared = 0.85). Likewise, in face-to-face discussions, the total number of words produced by the high-intermediate learners ($M = 1451.5$, $SD = 404.99$) were also higher than the lower-intermediate learners ($M = 269.75$, $SD = 328.01$). The difference was statistically significant, $t(3) = 3.36$, $p < 0.05$ (two-tailed) and the magnitude of the differences in the means (mean difference = 1181.75, 95% CI: 61.67 to 2301.83) was also very large (eta squared = 0.79).

The high-intermediate learners' contribution of words showed no significant difference across discussion settings, $t(23) = .336$, $p > 0.05$ (two-tailed). This means that the total number of words contributed by the more proficient language learners was not

found to differ between the online ($M = 215.04$, $SD = 147.09$) and face-to-face ($M = 241.92$, $SD = 147.09$) settings.

In contrast, the low-intermediate ESL learners showed a statistically significant difference in the number of words produced across discussion settings, $t(23) = 2.88$, $p < 0.01$ (two-tailed). The magnitude of the differences in the means (mean difference = 37.44, 95% CI: 21.11 to 128.65) was very large (eta squared = 0.27). In other words, the low-intermediate ESL learners' produced significantly more words in online discussions ($M = 59.92$, $SD = 83.12$) than when they were in face-to-face discussions ($M = 22.48$, $SD = 104.87$). This is especially evident for Group A in which the low-intermediate learners hardly spoke during the face-to-face discussions.

The findings showed that the high-intermediate ESL learners contributed more than their peers who had lower language proficiency regardless of the discussion environments they were in. This may be due to the lower affective filter amongst the more proficient ESL learners and greater language anxiety amongst the less proficient ones (Krashen, 1981; Macintyre, 2011). This finding was found similar to Collentine (2009). Other studies mentioned in *Section 2.8: The Influence of ESL Learners' Language Proficiency in Discussions* such as Arslanyilmaz (2012), Porter (1986), Iwashita (2001) and Tam (2009) also found that more proficient learners contributed more words than the less proficient students but no significant differences was found. These researchers felt that the small sample size in their studies might have caused the insignificant findings (Arslanyilmaz, 2012; Tam, 2009). Having learned the limitations in these previous studies, the present study involved a larger sample size and found significant findings.

Another important finding is that the low-intermediate learners were found to contribute significantly more words in online discussions than in face-to-face discussions. This suggests that online discussions could be a more favourable environment for low-intermediate learners to practise using the language as they may have felt more confident and motivated. This postulation was investigated through the qualitative analysis on the feedback of the participants in the survey and online feedback session. Further details can be gathered at *Section 4.3.2: Qualitative analysis*.

Even though the high-intermediate learners produced more words than the low-intermediate learners, it did not mean that their ideas were more solid than the others who contributed lesser. Likewise, more contribution of words by the low-intermediate learners in the online environment can suggest more active participation but not necessarily more informative output. Nevertheless, more active participation in discussions could indicate more engagement and exposure to comprehensible input, negotiation of meaning, noticing of form and comprehensible output (please refer to *Section 2.2: The role of discussions in SLA*).

For a better understanding of the discussion process that occurred in different discussion settings, the strikingly few words which have been contributed by the low-intermediate ESL learners in Group A during face-to-face discussions was investigated. Observation of the discussion transcript showed that the result might be linked to group dynamics, processes and developments and further explanation of this can be found at *Section 4.7: Group Dynamics, Processes and Development*.

The following part attempts to give a better overview of the interactions between personality and language proficiency with the different discussion environments – online and face-to-face.

4.3.1.3 The Influence of Learners' Personality and Language Proficiency

The influence of learners' personality and language proficiency in affecting the production of words in different discussion environments is examined in this part. Table 4.4 shows the contribution of words based on the combined variables of personality and language proficiency. The groups are indicated in parenthesis.

Table 4.4: Comparison of Total Words across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency

Discussion	Number of Words							
	Online				Face-to-face			
	Introverts		Extroverts		Introverts		Extroverts	
	High	Low	High	Low	High	Low	High	Low
1	539 (A)	338 (A)	552 (A)	304 (A)	34 (B)	474 (B)	965 (B)	219 (B)
2	546 (B)	288 (B)	630 (B)	337 (B)	53 (A)	2 (A)	1411 (A)	0 (A)
3	316 (A)	146 (A)	643 (A)	495 (A)	104 (B)	150 (B)	1259 (B)	215 (B)
4	670 (B)	400 (B)	1265 (B)	568 (B)	42 (A)	0 (A)	1938 (A)	19 (A)
Mean	517.8	293	772.5	426	58.3	156.5	1393.3	113.3
Standard deviation	147.4	108.2	330.8	126.1	31.5	223	407.6	120.1

(Note: Due to space constraints, the categories for high-intermediate and low-intermediate ESL learners are shortened to 'high' and 'low' respectively)

Based on Table 4.4, the extroverts with high-intermediate language proficiency contributed the most number of words whether they were discussing face-to-face or online. They contributed notably more words compared to all the other groups. However, their contribution of words was significantly more in face-to-face discussions

($M = 1393.3$, $SD = 407.6$) than in online discussions ($M = 772.5$, $SD = 330.8$), $t(3) = 8.04$, $p < 0.01$ (two-tailed). The mean difference was 620.8 with a 95% confidence interval ranging from 374.94 to 866.56. The eta squared statistic (.96) indicated a large effect size. As explained by Schallert et al. (1999), the more proficient and extroverted learners can perform better in face-to-face discussions than the shy and less proficient learners because pragmatic language skill is considered as a premium in face-to-face discussions.

In contrast to the extroverts with high-intermediate language proficiency, the extroverts with low-intermediate language proficiency produced significantly more words in online discussions ($M = 426$, $SD = 126.1$) than in face-to-face discussions ($M = 113.3$, $SD = 120.1$), $t(3) = 3.28$, $p < 0.05$ (two-tailed). The magnitude of the differences in the means (mean difference = 312.75, 95% CI: 8.96 to 616.54) was very large (eta squared = 0.78).

Similar to the extroverts with low-intermediate language proficiency, the introverts with high-intermediate language proficiency also contributed significantly more words in online discussions ($M = 517.8$, $SD = 147.4$) than in face-to-face discussions ($M = 58.3$, $SD = 31.5$), $t(3) = 5.22$, $p < 0.05$ (two-tailed). The mean difference was 459.5 with a 95% confidence interval ranging from 179.58 to 739.42. The eta squared statistic (.90) indicated a large effect size. Surprisingly, even though the introverts with high-intermediate language proficiency have considerably good command of English language, they hardly spoke during face-to-face discussions ($M = 58.3$, $SD = 31.5$) and their production of words was the least compared to the other groups. This suggests that their introverted personality may inhibit their desire to speak in face-to-face discussions. This finding is also in line with the studies conducted by

Jonassen (1994) and Whitworth (2009). Further explanation of these studies can be obtained in *Section 2.7: The Influence of ESL Learners' Personality in Discussions*.

Compared to the other groups, the introverts with low-intermediate language proficiency produced the least number of words online ($M = 293$, $SD = 108.2$). However, in face-to-face discussions, the number of words contributed by them ($M = 156.5$, $SD = 223$) were more than the extroverts with low-intermediate language proficiency ($M = 113.3$, $SD = 120.1$) and the introverts with high-intermediate language proficiency ($M = 58.3$, $SD = 31.5$). Even though the differences were not statistically significant, further analysis through qualitative approach is needed to understand the factors that have motivated the introverts with low-intermediate language proficiency to produce more words than the extroverts with low-intermediate language proficiency in face-to-face settings. This analysis has been done and can be referred to in *Section 4.3.2: Qualitative Analysis*. Apart from that, it should also be noted that the words produced by the introverted ESL learners with low-intermediate language proficiency showed no significant differences across discussion settings, $t(3) = 1.10$, $p > 0.05$ (two-tailed). In other words, they have contributed considerably few words in both face-to-face and online discussions. This result could be influenced by the learners' introverted personality and lower language proficiency level.

The following section provides further insight to the differences in the contribution of words by the ESL learners in different discussion settings through researcher's observation, qualitative analysis of the discussion transcripts and learners' comments in the online feedback session and survey (please refer to *Section 3.11.2: Qualitative Method* for more details on the methodology used to obtain qualitative findings).

4.3.2 Qualitative Analysis

The relevant themes (please refer to *Section 3.11.2: Qualitative method* for the way these themes were retrieved) which answer the first research question are presented below.

4.3.2.1 Confidence

From the response of the learners in the survey and online feedback session, confidence was the most often cited theme among the responses of the ESL learners. The lack of confidence is believed to be one of the reasons learners contributed less words in face-to-face discussions. Learners who belonged to the introverts and lower language proficiency group related to this more than the others; nine out of twelve learners expressed this explicitly. These students mentioned that they felt nervous, awkward and scared when communicating face-to-face in front of a large group. One of the participants (Participant 20, Group A) also explained that she felt shy to speak in face-to-face discussions due to her bad pronunciation. In such case, when the learners' anxiety increased, their affective filter impeded their performance in the discussions (Krashen, 1981). Thus, they contributed fewer words in face-to-face discussions. In the survey, they have also suggested smaller groups for face-to-face discussions so that they can be more confident to speak using the target language (please refer to *Section 4.8.3: Survey on the Views of Face-to-face and Online Discussions*).

Seven of the introverted learners who had low-intermediate English language proficiency reported that they felt more confident in online discussions. The reasons given were they did not see the audience's face and that the online discussion enabled

all the participants including the introverts to speak. Therefore, they felt that they can express their ideas better and clearer when they were typing. Moreover, online discussions did not require instant feedback and the learners can ponder longer before giving their response. Participant 21 from Group A elaborated that she can communicate with strangers or people whom she was not familiar with through online discussions as she did not need to worry about their objections as she was not facing them. The following responses from the introverts who had low-intermediate language proficiency in the survey and online feedback session exemplify their lack of confidence to speak in front of people.

(I prefer online discussions because) I can communicate with strangers without worrying about their objection as they are not in front of me
(Participant 21, Group A)

i prefer more online discussions than f2f.. because i felt really awkward when i'm speak in english in front of the public, moreover i cannot think the word that i'm going to say because f2f is spontaneous. 😬
(Participant 22, Group B)

From the learners' response, it is not surprising that eleven out of twelve (90%) of the introverted learners with lower language proficiency indicated their preference for online discussions. This is followed by 83% of the introverted learners with better English language proficiency and 82% of the extroverted learners with lower language proficiency. This finding is also supported by the current literature which can be referred to in *Section 2.7: The Influence of ESL Learners' Personality in Discussions* and *Section 2.8: The Influence of ESL Learners' Language Proficiency in Discussions*.

Interestingly, the learners who belonged to the extroverts and low-intermediate proficiency group felt shy to give their opinions in face-to-face settings despite their extroverted personality. The reason may be caused by their considerably lower level of

English language proficiency. They felt more comfortable and confident in front of the computers. Talking to a group of people in face-to-face discussions was daunting for them. This attitude was found to differ greatly from the extroverted learners with high-intermediate proficiency who savoured face-to-face interactions. The responses below by participants 15 and 17 (Group B) exemplified the lack of confidence among the extroverts with low-intermediate language proficiency when they were involved in large group face-to-face discussions:

oh my god, the most challenging part is when I want to start speaking with the people which are really good in English. and sometimes I do not get the idea what I supposed to speak with.

(Participant 17, Group B)

well..because i have low self confidence so i think online discussion is more working for me... when its f2f i just don't know what to say and i'll just stay silent. and i'm a fast-typist so it is easier..

(Participant 15, Group B)

Despite that, there were also extroverts who were unperturbed by their language proficiency. For instance,

Awe , for me F2F is more worked compared online discussions . Well , in order to be fluent in English . we should be brave in front of crowd , right ? It doesnt matter if we pronounce some other words which is quite bizarre wrongly , at least we're trying to be brave as well & not COWARD yeahhh ! :cheers[b]

(Participant 14, Group A)

For the introverts who had better English language proficiency, about 75% of them mentioned their personality as one of the inhibiting factors for them to speak confidently in face-to-face discussions. As an example:

I think, I would choose online because I can't talk in front of people. I don't have the confident in me. But, one day I promise I will talk in front of people fluently, but not now. Face to face is good, but I prefer speak my mind through typing. 😊

(Participant 12, Group A)

The introverts with high-intermediate language proficiency also mentioned the influence of the environment on their production of words in the survey given. For instance, participants 8 and 11 from Group B felt that they can speak freely without interruption in the online setting and need not worry about other people's reactions. The messages that they wanted to share can also be conveyed to everyone easily and more responses can be gathered from people with different nationalities and religions (Respondent 7, Group B). While in face-to-face discussions, they cannot really speak their minds in front of many people and would need to rethink about their messages many times before saying it (Participant 8, Group B).

Participant 10 (Group B) drew the attention of the researcher during the analysis. Categorised under the group of introverts with high-intermediate language proficiency, this respondent chose face-to-face discussions as her preference unlike the others in the group who circled online discussions as their choice. In the survey, she reasoned that she had more things to say in front of people and face-to-face discussions can help her to build self-confidence. In the online feedback session, she further revealed that she has tried both face-to-face and online interactions with her brother and found that she was very weak in online discussions as she used broken English (ungrammatical use of English language). However, it is intriguing to find that she only spoke 3 words (*yes I agree*) during the face-to-face discussions in this study but up to 582 words during the online discussions. The following shows the whopping response of 390 words in one of the online discussions.

thank you for the information. well, i have known one person that once suffering from depression. this happened seven years ago when i was only ten years old.

at that time , i can tell from her face that she was suffering and feeling depressed. she lost her husband and her youngest children during that time. all i can say about her is she cannot stop crying especially at night. that is what we called as uncontrollable crying and one day she had to overcome the problems at her late husband's company. She had no time for her children, she had to settle this and that and that causes her to be so depressed.

well as for me depression are cause by situation that a person is having such as difficult life events, loss, change, or persistent stress can cause levels of neurotransmitters to become unbalanced, leading to depression. Another causes that cause depression are he or she is living alone and social isolation or like what i told you just now about being recently widowed.

There are many ways to overcome depression. First, you have to have an enough sleep. Getting the right amount of sleep is healthy for our body and mind. Some argue that sleep deprivation treats depression, but I do not buy it. I think it is a cheap distraction that catches up to you within days. Get enough rest. Secondly, you can overcome depression by doing exercise.

If you are physically capable, try one hour of cardio (or as much as you can). If you are tee-shirt is soaking wet, you are standing in a puddle of your own sweat, and you can feel the endorphins pumping through your body, you did it right. Shower up and try not being happy, I dare you. the next step is you can write a journal and make it as your best friend. This could be an escape but it does not have to be. You can write about fiction, and transport yourself to another world, or you can write about what is going on, and let your thoughts carry you through to a solution. Many great books were written by people who were, at least at the time, going through a period of pain and suffering.

it is not a very good information from me, thank you 😊

The above response by Participant 10 (Group B) was atypical. She was the only extraordinary participant that has shown contradicting performance to her self-believed extroverted personality. This suggests that the personality test and teacher's observation may be more reliable than the self-proclamation by the participant herself. In other words, feedback by the learners is not always reliable and the triangulation method can help to gather more accurate findings.

Even though the introverted ESL learners preferred online discussions which matched with their personalities, they also recognised the importance of face-to-face discussions. For instance, Participant 9 from Group A preferred online discussions but she felt that face-to-face discussions would be more beneficial in building her level of confidence to speak in front of people even though it would be quite hard for her. The following excerpt from Participant 12 (Group B) in the online feedback session further accentuates the idea.

*i prefer online discussion because i'm a shy person. 😊 but f2f is good because we can improve our speaking and can build confidence.
i think f2f can improve our communication skill. i'm a shy girl and for me to improve this, i have to practice more because practice makes perfect.*

Similar responses have also been given by learners from the other groups. About 35% of the participants have explicitly given credits to both types of discussions and none indicated objections to face-to-face or online discussions. Thus, even though the introverted high-intermediate, introverted low-intermediate and extroverted low-intermediate learners felt more confident in online discussions, they acknowledged the importance of face-to-face discussions and hoped to improve their performance when discussing face-to-face.

4.3.2.2 Motivation

Motivation is another frequently cited theme that is gathered from the participants' survey and online feedback session. It is also one of the reasons why some learners produced lesser or more words in face-to-face discussions. The factors which motivated the learners to speak more during face-to-face discussions are discussed in this section.

In this study, an introverted learner with low-intermediate language proficiency, participant 24 from Group B, was surprisingly different from the other learners who shared the same kind of personality and level of language proficiency. Unlike the rest in the group she was categorised in, she spoke the most in face-to-face discussions. She was motivated to speak English as she knew the importance of English language in a global world. During the face-to-face discussions, she has also contributed the most number of words among the group of low-intermediate introverted learners (73% in discussion 1 and 89% in discussion 3). Her considerably active participation has also affected the data (as shown in *Table 4.4: Comparison of Total Words across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency*) to show that the introverted low-intermediate learners can produce more words compared to the extroverted low-intermediate and introverted high-intermediate learners.

An excerpt from the online feedback session shed more light for her attitude:

actually i was like (Participant 8, Group B) too...but then i think how if we meet traveller or travel to other country? we need to learn way to speak in english smoothly..so the best way is by f2f discussion

(Participant 24, Group B)

The response of Participant 24 (Group B) has shown the other learners the importance of face-to-face discussions.

A majority of the extroverted learners with better command of English language have also indicated their preference for face-to-face discussions. From the survey, eight out of twelve learners (about 70%) preferred face-to-face discussions. They recognised the importance of face-to-face interactions in training them to speak English confidently in front of others. They were also aware of the importance of face-to-face interactions in

the real world. For instance, the interviews for scholarships and jobs which they were interested in would be held face-to-face rather than online (Participant 5, Group A and Participant 2, Group B). They also realised the importance of speaking English if they wanted to further their studies abroad (Participant 3, Group B). Moreover, they knew that they were the future leaders and thus need to be able to speak confidently in front of a crowd (Participants 2 and 5, Group B). The following is a response from a high-intermediate extroverted learner with her reasons for favouring face-to-face discussions:

I love both! But somehow after 16 years of living, me myself express my idea better if I go online rather than f2f discussion. Still, f2f discussion is the one who will really help you. People maybe can write a good essay but it doesn't mean that they have the ability to convey their messages to people, which is obviously more important.

Long live face-to face discussion! Hahahahaha

(Participant 6, Group A)

During the face-to-face discussions, the high-intermediate extroverted learners were also found to lead most of the discussions. They kicked off the discussions, initiated shift in the topic and concluded the discussions. The excerpt below showed the 'leader' role taken up by Participant 1, Group B:

So as the student in this school. So what do you think about the inconvenience of shortage of water in this school? Anyone wants to say? What??

so apart from that do you think do you think what do you think is the school's role in order to prevent; to cope with water shortage. I mean apart from students, the schools also have to do their roles in to help us coping with water shortage

reduce lots and lots of water

I think that is all for our discussion... ha ha ha ha..

4.3.2.3 Noise

From the observation and transcripts of the discussions, the participants often had difficulty in starting the face-to-face discussions after the topic was read out loud. They would be whispering among themselves or jot down notes on a strip of paper instead of start speaking to the group. The teacher had to interrupt to set the discussion. The situation can be observed from the excerpt below:

- Teacher* I am going to read it once again. Water conservation. Our topic for today is water conservation. The water supply in the hotel... hostel is disrupted again... for the umpteenth time! The school has done everything they could such as contacting the Water Supply Department and installing more water tanks. However, the condition has not improved. The students plan to take a more active role to cope with the water shortage. As a member of the Student Union, voice out the inconvenience of water shortage and discuss ways to cope with it.
Any questions? If not you may start now.
- P2, Grp B* Who would want to start?
- P1, Grp B* Everyone must... (others whispering)
- Teacher* Any questions? You can ask your friends here? [pause] Don't need to whisper to your friends beside you... tell the whole group. [pause] What's the first question there... hmm... voice out the inconvenience of water... when there is no water supply...
P1, Grp B difficult...
- Teacher* one by one
- P1., Grp B* It's already started teacher?
- Teacher* Yea it's already started. [ss giggling]. I heard you just whisper to your friends. Share your opinion with everyone
(pauses)

From the researcher's observation, the noises that interrupted face-to-face discussions were giggles, whisper and the softness of the creator's voice. They could affect effective listening and cause reduced responses.

Without making any sound, noise could also occur in online discussions. For instance, the stability of network connection might be interrupted and learners were

forced to change computers. Sometimes, the speed of the network was also slow. This interrupted the discussion process. More contributions from the participants can be gathered if these ‘noises’ were eliminated. As discussed in Shannon's (1948) Model of the communication process in *Section 2.4.3: Shannon's Information Theory Model (The Active Model)*, noise can affect the interaction process and caused less production of words in discussions. From the researcher's observation, ‘noise’ can occur in both face-to-face and online discussions. However, it is unclear to what extent the different types of noise affect the learners' contribution of words in online and face-to-face discussions. Though *noise* can affect the communication process, its influence may be minimal in this study as the teacher/researcher has stepped in abruptly when these problems occurred.

All in all, the findings to research question 1 is in line with Foulger's *Ecological Model of the Communication Process* (2004; please refer to *Section 2.4.6: The Ecological Model of Communication*) as the medium of interaction was found to play a role in influencing the messages of certain group of learners more than the others. For instance, the ESL learners especially the ones with introverted personality and lower language proficiency level found online discussions to be less threatening. This was because they can ponder longer and contribute more words to the discussions with more confidence (Warschauer, 1996). On the other hand, the face-to-face environment caused more anxiety among the introverts and less proficient learners as immediate response from them was anticipated (Hamat, 2008; Jonassen, 1994). For the extroverts who were generally more motivated and confident of themselves, they were found to be able to contribute to the discussions in both face-to-face and online discussions.

This study also found that noise can interrupt the effectiveness of a discussion and can influence the participants' production of words. Noise was found in both face-to-face and online settings but abrupt measures have been taken and thus the effect on the reliability of this study was minimal. Nonetheless, the different types of noises that existed in face-to-face and online discussion settings have been identified and can inform the language instructors of what to take note of in ESL classes (please refer to *Section 5.3.3: Implications for pedagogy*).

After learning more about the contribution of words among the ESL learners in face-to-face and online discussions, the following section looked into their participation style across discussion settings.

4.4 Balanced Participation

Research question 2:

What type of participation style is shown by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) in face-to-face and synchronous online discussions?

This section attempts to find out the participation style of the ESL learners in face-to-face and synchronous online discussions. In this research, the participation style refers to the balanced or imbalanced participation of the different groups of learners. It is important for ESL language instructors and researchers to encourage balanced participation among learners and thus the potential of online or face-to-face discussions in promoting more equal participation among learners is investigated.

The following section reports the findings for research question 2 through quantitative approach.

4.4.1 Quantitative Analysis

To find out if learners' participation was equally balanced in face-to-face and online discussions, the number of words contributed per student was firstly used to calculate the participation percentage per respondent, which was then used to determine the gini coefficient (please refer to Appendix 3 for explanation) for each group. The gini coefficients for each of the discussion were obtained from the website *Free Statistics and Forecasting Software* (Wessa, 2012). Coefficients obtained for participation in the two types of discussions are presented in Table 4.5. Groups are indicated in parentheses.

Table 4.5: Comparison of Equity of Participation across Discussion Conditions

Discussion	Gini Coefficients	
	Online	Face-to-face
1	0.45 (Group A)	0.79 (Group B)
2	0.48 (Group B)	0.84 (Group A)
3	0.52 (Group A)	0.86 (Group B)
4	0.35 (Group B)	0.87 (Group A)
Mean	0.45	0.84
Standard deviation	0.07	0.04

The paired-samples t-test from the IBM SPSS Statistics 20 software revealed a statistically significant difference in gini scores across discussion settings, $t(3) = 8.83$, $p < 0.01$ (two-tailed). The mean difference was 0.39 with a 95% confidence interval ranging from 0.25 to 0.53. The eta squared statistics (.97) indicated a very large magnitude in the difference of the ESL learners' participation in face-to-face and online discussions. This suggests that, while participation in the online discussions ($M = 0.45$,

$SD = 0.07$) was more equally distributed among the students, during the face-to-face discussions ($M = 0.84$, $SD = 0.04$), a small number of students tended to dominate the discussion. This finding is found to be similar to Fitze (2006), Kamhi-Stein (2000), Marjanovic (1999), Sullivan (1998) and Warschauer (1996); details can be referred to in *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*. However, it should be noted that Fitze (2006) found the participation more balanced among students in online discussions for one of the classes while the students in another class showed about equally balanced participation regardless of the discussion settings. This differed from the samples in this study; both groups showed more balanced participation in online discussions.

More balanced participation in online discussions can be observed because the “media” or the environment enabled the ESL learners to respond at the same time in a less threatening environment (Lapadat, 2002; Warschauer, 1998). However, even though students can produce words faster in face-to-face discussions, the turn taking process and the “threatening” aspect which hindered participation from introverts has caused it to be dominated by the extroverts (Simpson, 2005; Smith, 2003).

To find out the group that dominated the face-to-face discussions in this study, the results are analysed according to the learners’ personality types and language proficiency levels. The findings are explained in the following parts.

4.4.1.1 The Influence of Learners’ Personality

Table 4.6 presents the gini coefficients of the introverted and extroverted learners in each discussion; the groups are indicated in parenthesis.

Table 4.6: Comparison of Equity of Participation for the Extroverts and Introverts across Discussion Settings

Discussion	Gini Coefficients			
	Online		Face-to-face	
	<i>Introverts</i>	<i>Extroverts</i>	<i>Introverts</i>	<i>Extroverts</i>
1	0.38 (A)	0.51 (A)	0.85 (B)	0.73 (B)
2	0.60 (B)	0.35 (B)	0.91 (A)	0.71 (A)
3	0.45 (A)	0.49(A)	0.81 (B)	0.81 (B)
4	0.35 (B)	0.29 (B)	0.92 (A)	0.76 (A)
Mean	0.44	0.41	0.87	0.75
Standard deviation	0.11	0.11	0.05	0.47

Based on Table 4.6, a statistically significant difference was found in the gini coefficients of the extroverts in online and face-to-face settings, $t(3) = 6.86$, $p < 0.01$ (two-tailed). The magnitude of the differences in the means (mean difference = 0.34, 95% CI: 0.18 to 0.50) was very large (eta squared = 0.94). Likewise, the introverts' gini coefficients also showed a statistically significance difference for their participation in online and face-to-face discussions, $t(3) = 7.74$, $p < 0.01$ (two-tailed). The mean difference was 0.43 with a 95% confidence interval ranging from 0.25 to 0.61. The eta squared statistics (.95) indicated a very large magnitude in the difference of the ESL learners' participation in face-to-face and online discussions.

From the findings, both the introverts and extroverts showed more balanced participation in online discussions (introverts: $M = 0.44$, $SD = 0.11$; extroverts: $M = 0.41$, $SD = 0.11$) than in face-to-face discussions (introverts: $M = 0.87$, $SD = 0.05$; extroverts: $M = 0.75$, $SD = 0.47$). In other words, online discussions enabled the introverted and extroverted learners to participate equally and not dominated by a few learners as in face-to-face discussions. This also means that there were more learners who belonged to the extroverts or introverts groups that have contributed more in online discussions.

The obscurity of aural and visual paralinguistic cues may have made the online environment less threatening and encouraged more participation from the introverts and thus result in more balanced participation (Beauvois, 1998; Bohlke, 2003; Kern, 1995). For more information about the absence of visual cues in online discussions, please refer to *Section 2.6: The Comparison of Discussions in Face-to-face and Online Settings*.

Even though the extroverts showed more balanced participation ($M = 0.75$, $SD = 0.47$) than the introverts ($M = 0.87$, $SD = 0.05$) in face-to-face discussions, the finding was not statistically significant, $t(3) = 0.27$, $p > 0.05$ (two-tailed). In online discussions, the extroverts also showed more balanced participation ($M = 0.41$, $SD = 0.11$) than the introverts ($M = 0.44$, $SD = 0.11$) and the finding was also not statistically significant, $t(3) = 0.42$, $p > 0.05$ (two-tailed). In other words, the face-to-face environment may be more intimidating to the introverts and thus it became dominated by the extroverts (Simpson, 2005; Smith, 2003).

The next part analyses and explains the other important variable which is learners' language proficiency.

4.4.1.2 The Influence of Learners' Language Proficiency

The gini coefficients of the high-intermediate and low-intermediate ESL learners in each discussion are presented in Table 4.7. The learners' groups are indicated in parenthesis.

Table 4.7: Comparison of Equity of Participation for High-Intermediate and Low-Intermediate ESL Learners across Discussion Settings

Discussion	Gini Coefficients			
	Online		Face-to-face	
	<i>High-intermediate</i>	<i>Low-intermediate</i>	<i>High-intermediate</i>	<i>Low-intermediate</i>
1	0.37 (A)	0.50 (A)	0.81 (B)	0.74 (B)
2	0.51 (B)	0.34 (B)	0.68 (A)	0.92 (A)
3	0.44 (A)	0.57 (A)	0.85 (B)	0.73 (B)
4	0.27 (B)	0.34 (B)	0.75 (A)	0.92 (A)
Mean	0.40	0.44	0.77	0.83
Standard deviation	0.11	0.12	0.07	0.11

The paired-samples t-test from the IBM SPSS Statistics 20 software revealed a statistically significant difference in the gini coefficients of the high-intermediate learners in online and face-to-face settings, $t(3) = 5.38$, $p < 0.05$ (two-tailed). The mean difference was 0.37 with a 95% confidence interval ranging from 0.15 to 0.60. The eta squared statistics (.91) indicated a very large magnitude in the difference of the high-intermediate ESL learners' participation in face-to-face and online discussions. Similarly, the gini coefficients of the low-intermediate ESL learners also showed a statistically significant difference for their participation in the different discussion settings, $t(3) = 3.49$, $p < 0.05$ (two-tailed). The magnitude of the differences in the means (mean difference = 0.39, 95% CI: 0.03 to 0.74) was very large (eta squared = 0.80). In other words, both the high-intermediate and low-intermediate ESL learners showed more equal participation in online (high-intermediate: $M = 0.40$, $SD = 0.11$; low-intermediate: $M = 0.44$, $SD = 0.12$) rather than face-to-face discussion settings (high-intermediate: $M = 0.77$, $SD = 0.07$; low-intermediate: $M = 0.83$, $SD = 0.11$).

Referring to Table 4.7, the high-intermediate learners showed more balanced participation ($M = 0.77$, $SD = 0.07$) than the low-intermediate learners ($M = 0.83$, $SD = 0.11$) in face-to-face discussions but the finding was not statistically significant, $t(3) =$

0.63, $p > 0.05$ (two-tailed). In online discussions, more balanced participation has also been shown by the high-intermediate learners ($M = 0.40$, $SD = 0.11$) compared to the low-intermediate learners ($M = 0.44$, $SD = 0.12$). However the finding was not statistically significant, $t(3) = 0.58$, $p > 0.05$ (two-tailed).

The next part attempts to analyse the combined effect of learners' personality and language proficiency on their participation style.

4.4.1.3 The Influence of Learners' Personality and Language Proficiency

The influence of learners' personality and language proficiency in affecting their participation style in different discussion environments is examined in this part. Table 4.8 shows the gini coefficients obtained in each discussion based on the combined variables of personality and language proficiency. The groups are indicated in parenthesis.

Table 4.8: Comparison of Equity of Participation across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency

Discussion	Gini Coefficients							
	Online				Face-to-face			
	Introverts		Extroverts		Introverts		Extroverts	
	High	Low	High	Low	High	Low	High	Low
1	0.32 (A)	0.38 (A)	0.40 (A)	0.59 (A)	0.80 (B)	0.74 (B)	0.65 (B)	0.63 (B)
2	0.65 (B)	0.37 (B)	0.31 (B)	0.28 (B)	0.83 (A)	0.83 (A)	0.41 (A)	- (A)
3	0.31 (A)	0.54 (A)	0.46 (A)	0.47 (A)	0.82 (B)	0.78 (B)	0.74 (B)	0.65 (B)
4	0.29 (B)	0.34 (B)	0.16 (B)	0.28 (B)	0.83 (A)	- (A)	0.52 (A)	0.83 (A)
Mean	0.39	0.41	0.33	0.40	0.82	0.78	0.58	0.70
Standard deviation	0.17	0.09	0.13	0.15	0.01	0.05	0.14	0.11

(Note: Due to space constraints, the categories for high-intermediate and low-intermediate ESL learners are shortened to 'high' and 'low' respectively)

Based on Table 4.8, the group of extroverts with high-intermediate language proficiency showed the most equal participation in the online discussion setting ($M = 0.33$, $SD = 0.13$). Their participation was also the most balanced during the face-to-face discussions when compared to the other groups ($M = 0.58$, $SD = 0.14$). This suggests that there were more extroverts with high-intermediate language proficiency who participated more actively in both face-to-face and online discussions. However, the gini coefficients of the extroverts with high-intermediate language proficiency showed statistically significant difference when they were in online ($M = 0.33$, $SD = 0.13$) and face-to-face discussion settings ($M = 0.58$, $SD = 0.14$), $t(3) = 4.63$, $p < 0.05$ (two-tailed) in which the mean difference was 0.25 with a 95% confidence interval ranging from 0.08 to 0.42. The eta squared statistic (.88) indicated a large effect size. This suggests that there were a higher number of extroverts with high-intermediate language proficiency contributing more actively in online discussions than in face-to-face discussions.

In contrast to the extroverts with high-intermediate language proficiency, the extroverts with low-intermediate language proficiency did not show statistically significant difference for their participation style across discussion settings, $t(2) = 1.70$, $p > 0.05$ (two-tailed). Despite that, the extroverts with low-intermediate language proficiency has shown more balanced participation when they were discussing online ($M = 0.40$, $SD = 0.15$) than in face-to-face ($M = 0.70$, $SD = 0.11$).

Similar to the extroverts with high-intermediate language proficiency, the introverts with high-intermediate language proficiency also showed more balanced participation when they were discussing online ($M = 0.39$, $SD = 0.17$) than face-to-face ($M = 0.82$, $SD = 0.01$), $t(3) = 5.23$, $p < 0.05$ (two-tailed). The magnitude of the

differences in the means (mean difference = 0.43, 95% CI: 0.17 to 0.69) was very large (eta squared = 0.90). This means that there was a higher number of introverts with high-intermediate language proficiency contributing online and thus showing more balanced participation in the online setting. It is also interesting to note that the introverts with high-intermediate language proficiency (followed by the introverts with low-intermediate language proficiency) showed the most imbalanced participation style in face-to-face discussions. This may indicate that there were more introverted learners who were afraid to speak up when they were in a face-to-face environment.

Compared to the other groups, the introverts with low-intermediate language proficiency showed the least balanced participation in online discussions ($M = 0.41$, $SD = 0.09$). This is followed by the extroverts with low-intermediate language proficiency ($M = 0.40$, $SD = 0.15$). Their language proficiency may have played a role in inhibiting these learners from participating as actively as their peers with higher language proficiency in online discussions. Nonetheless, the introverts with low-intermediate language proficiency still showed more balanced participation when they were in online discussions ($M = 0.41$, $SD = 0.09$) than in face-to-face discussions ($M = 0.78$, $SD = 0.05$), $t(3) = 5.53$, $p < 0.05$ (two-tailed). The mean difference was 0.37 with a 95% confidence interval ranging from 0.08 to 0.62 and the eta squared statistic (.94) indicated a large effect size. This means that there were more introverts with low-intermediate language proficiency contributing online and thus more balanced participation in the online setting was observed. The findings also imply that the language proficiency of the learners may have a bigger influence than their personality in affecting the learners' performance during online discussions. As confessed by the introverts in the online feedback session, the influence of their introverted personality was reduced in the online setting as they were more confident to contribute when they

did not need to face the consumers of the messages (please refer to *Section 4.3.2.1: Confidence*).

In sum, the participation of all the ESL learners were more balanced in online discussions. All but the extroverts with low-intermediate language proficiency showed significantly more balanced participation in online discussions. This finding is similar to many studies (e.g. Beauvois, 1998; Bohlke, 2003; Fitze, 2006; Kern, 1995; Marjanovic, 1999; Sullivan, 1998; Warschauer, 1996) which found more balanced participation in online discussions (please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence* for details). However, it should be noted that this study has found significantly more balanced participation for all groups of learners in online discussions except for the extroverts who had low-intermediate language proficiency. The reason may be that there were more learners who were inhibited to participate due to their lower language proficiency level. Further analysis of the participation style of the ESL learners through a qualitative approach is explained in the next section.

4.4.2 Qualitative Analysis

From the quantitative findings, the learners' participation was found to be more balanced in online discussions than in face-to-face discussions. The reason could be linked to the more contribution of words by different groups of learners in online discussions as opposed to face-to-face discussions which were dominated by the extroverts who were also more proficient ESL learners (please refer to *Section 4.3.1.3: Quantitative Analysis* for details). However, it is actually interesting to note that the high-intermediate extroverted learners actually hated their dominance in face-to-face discussions as can be observed in the excerpt of the following discussion transcript:

P11, Grp A Other opinion?
P6, Grp A I don't agree too. Now i hate my voice.
P2, Grp A Yea.. kind of. I hate mine too

These high-intermediate extroverted learners have also expressed their wishes for more people to join in as shown in the dialogue below:

P6, Grp A Express yourself guys..
P2, Grp A Yeah.
P11, Grp A At last. Here I just want to ask for your opinion about the lately as we all know government wants to change the PMR format.

After the invitation by participants 6 and 2, participant 11 from the high-intermediate introverted group spoke and the phrase “at last” seemed to suggest that she has been waiting for a chance to speak. However, there were not many others who joined in the discussion after her.

On the contrary, online discussions garnered more positive response as concluded by Participant 1 from Group A in her first online discussion:

okay, times up, suddenly i feel that eng class is fill with awesomeness ! as the conclusion, do conserve water, as u know, we cant even live without water. Do anything possible to save water, so longg

As illustrated above, the very different kinds of responses gathered from the participants in different discussion environments need further examination. Apart from the factors which have affected the contribution of words in face-to-face and online discussions (discussed in *Section 4.3.2: Qualitative Analysis*), the other possible factors are discussed in the following parts.

4.4.2.1 The Affective Domain

The affective domain refers to the area related to the attitude and emotion of the learners. This is an important factor which influences SLA (Krashen, 1987). According to Krashen's (1981) affective hypothesis, when the learners are more motivated and confident, their affective filter is lower and thus tend to communicate more with others to receive more comprehensible input. The themes of confidence and motivation have been discussed in *Sections 4.3.2: Qualitative Analysis*. In this section, the theme of the affective domain is brought up to highlight the other types of emotive feelings learners have towards the discussion medium that have influenced their participation style.

In the survey and online feedback session, the learners expressed their preferences for online discussions as they can share more ideas, receive more feedback and better understand others' opinions (Participant 10, 22 from Group A, Participants 17, 18, 20, 21, and 23 from Group B). This is because they did not need to wait for their turns and they can give as many opinions as they would like to at anytime and anywhere without anyone stopping them (Lamy & Goodfellow, 1999; Warschauer, 1998; Yates, 2001). More benefits of online discussions can also be referred to in *Section 2.5: The Potential of the Online Discussion Setting* for details.

The participants in this study also found online discussion to be a fun and interesting way to learn English language (Participant 22 from Group A, Participants 5, 12, 13, 15 and 21 from Group B). This is because they felt more relaxed during online discussions (Participants 9 and 14 from Group B). Apart from that, they also felt more comfortable with online discussions as they were familiar with the use of computers and Internet (Participant 5 from Group B). More importantly, they liked to type and loved to

use computers (Participants 13 and 15 from Group B); as can be seen in the following excerpt:

i prefer more to online discussion because i love to use computer.. 😊 in that way,i can survey the feedback comments from others to me..i also can type all the things inside my mind freely because i had less confident to talk face to face with others especially with someone that i do not know. 🤪

(Participant 15, Group B)

This positive attitude towards online discussions was also seen in a few other studies (e.g. Vonderwall, Liangg & Alderman, 2007; Warschauer, 1996; Wang & Woo, 2007) which have been discussed in *Section 2.5: The Potential of the Online Discussion Setting* and *Section 2.6: The Comparison of Discussions in Face-to-face and Online Settings*. In these studies, the learners generally perceived online discussions to be freer, more comfortable, less aggressive and can produce a more equal opportunity for all to voice their thoughts. This is especially beneficial to the learners in subordinated positions such as the introverted and the less proficient learners (Belcher, 1999; Kern, 1995). With the learners feeling more positive about the discussion condition, the learners' anxiety level would also become lower and more receptive to comprehensible input and ultimately become more successful ESL learners (Krashen, 1987; Warschauer, 1996). Thus, online environment is believed to be conducive for discussions when there are groups composed of different personality types and levels of language proficiency.

On the contrary, Participant 3 (Group B) who was an advocate for face-to-face discussions in this study felt that the messages in online discussions were not very informative. One of her messages in the online feedback session is shown below:

f2f is better than online discussion ! for me , we will talk crap when it comes to the online discussion -.-

Despite that, Participant 3 (Group B) produced much more words in online discussions (359 words) than in face-to-face discussions (69 words). This might be related to her claim that she was used to online discussions.

To sum up, the participants' positive perceptions or attitudes towards a certain discussion setting can affect their participation style during face-to-face or online discussions. However, the perceptions could also be developed from their previous experience and thus language instructors should carefully design a conducive and pleasurable discussion environment which can lower the learners' affective filter and boost their confidence, motivation and active participation. In view of the less balanced participation among learners in face-to-face discussions, the researcher has asked the participants to suggest some measures for improvement which have also enlightened the researcher about the factors associated with learners' imbalanced participation in face-to-face discussions. Preparation was one of the suggestions given by the participants. The details are shown in the following section.

4.4.2.2 Preparation

To increase the balanced level among the participants in face-to-face discussions, participants 4 and 20 from Group B suggested more time for preparation before a discussion so that they can be more confident to share their views during face-to-face discussions. Even though participant 4 was an extrovert with high-intermediate language proficiency, she confessed in the online feedback session that she cannot really speak spontaneously and that she felt blank in the face-to-face discussions because she had no idea of what to talk about. However, after being persuaded by

Participant 3 (Group B) of the importance to try to speak up spontaneously, she responded in such a way:

Yea,(Participant 3, Group B) is right. Maybe i have to try to improve my communication skill. For me, a person who have good communication skill can speak well and give their opinion easily throughout the discussion. I really have to figure out some way to overcome my weakness . Hehe.. 😊

As shown in the message below, Participant 10 from Group B was also convinced by Participant 3 (Group B).

*hahhaa you are right (Participant 3, Group B). 😊
(Participant 3, Group B) , after this , we will speak english in dorm ok?
to practice our SPEAKING SKILLS*

The above excerpts suggest that creating an online synchronous discussions and explicitly talking about the importance of the skills involved in different discussion settings can change learners' perception towards a certain mode of discussion and perhaps promote more active participation in future discussions. While preparation was requested by the learners for face-to-face discussions, the request for time to prepare in online discussion has not been mentioned in the collected data. As shared by Participant 21 from Group B, they had sufficient time to arrange their sentences in online discussions when compared to face-to-face discussions.

The findings showed that the online discussion which involved self-paced typing was a better platform for allowing the learners, irrespective of language proficiency and proficiency, to participate actively. On the other hand, the learners in face-to-face discussions required more time to prepare in advance so that more balanced participation can be observed among the ESL learners with different personality types and language proficiency levels. This finding is in line with Wang and Woo (2007) who also found that learners need time to prepare beforehand so that they can contribute

more worthy opinions during face-to-face discussions. This is different from the online discussion setting in which learners can have sufficient time to look for resources in the Internet during the discussions (Wang & Woo, 2007).

4.5 Lexical Complexity

Research question 3:

What is the difference in the lexical complexity displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

This section analyses the lexical complexity of the discourse produced by the ESL learners in face-to-face and synchronous online discussions. In this study, lexical complexity refers to the learners' ability to exhibit a wide range of unique words (please refer to *Section 1.9: Definition of Terms* for more explanation of the term).

The quantitative and qualitative findings for research question 3 are reported in the following sections.

4.5.1 Quantitative Analysis

To determine if one type of discussion tended to be more lexically complex, or to exhibit greater lexical range, the standardised type-token ratios for the discussions were calculated. *Type* refers to the different words *while token* refers to the number of words. In this study, the standardised type-token ratio was computed for every 100

words for the discussions transcripts to get a running average type-token ratio. The standardised type-token ratios are presented in Table 4.9; group is indicated in parenthesis.

Table 4.9: Comparison of Standardised Type-Token Ratios across Discussion Conditions

Discussion	Standardised Type-token Ratios	
	Online	Face-to-face
1	70.82 (Group A)	62.06 (Group B)
2	71.41 (Group B)	64.43 (Group A)
3	73.33 (Group A)	63.41 (Group B)
4	67.41 (Group B)	61.1 (Group A)
Mean	70.74	62.75
Standard deviation	2.47	1.47

The paired-samples t-test revealed a statistically significant difference across discussion settings, $t(3) = 10.88$, $p < 0.01$ (two-tailed). The magnitude of the differences in the means (mean difference = 8.24 CI: 5.83 to 10.65) was very large (eta squared = 0.98). This showed that the discourse produced by the students in online discussions ($M = 70.17$, $SD = 28.53$) was more lexically complex, or in other words, exhibited a greater lexical range and wider range of vocabulary than the discourse produced in face-to-face discussions ($M = 62.50$, $SD = 36.36$).

The finding in this study is found similar to Warschauer (1996) and Fitze (2006) which found students displayed more lexical complexity in online discussions (please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence* for details). More lexical complexity can be seen in online discussions mainly because students conveyed emotions and ideas more explicitly in the absence of

non-verbal communications such as facial expressions, body language and tone of voice (Fitze, 2006).

The following parts investigate further on this issue by examining the influence of learners' personality and language proficiency.

4.5.1.1 The Influence of Learners' Personality

To evaluate the effect of students' personality on the lexical complexity displayed in different discussion environments, a paired-samples t-test was conducted on the standardised type-token ratios of the extroverts and introverts in each discussion. The totals are presented in Table 4.10; groups are indicated in parenthesis.

Table 4.10: Comparison of Standardised Type-Token Ratios for the Extroverts and Introverts in Online and Face-to-Face Discussions

Discussion	Standardised Type-token Ratios			
	Online		Face-to-face	
	<i>Introverts</i>	<i>Extroverts</i>	<i>Introverts</i>	<i>Extroverts</i>
1	68.25 (A)	71.00 (A)	60.50 (B)	62.00 (B)
2	72.00 (B)	71.78 (B)	66.00 (A)	64.38 (A)
3	73.00 (A)	71.50 (A)	70.00 (B)	64.00 (B)
4	68.10 (B)	66.61 (B)	- (A)	61.79 (A)
Mean	70.34	70.22	65.5	63.04
Standard deviation	2.53	2.43	4.77	1.34

Based on Table 4.10, statistically significant difference was found with the extroverts showing more lexical complexity in online discussions ($M = 70.22$, $SD = 2.43$) than in face-to-face discussions ($M = 63.04$, $SD = 1.34$), $t(3) = 7.77$, $p < 0.01$ (two-tailed). The magnitude of the differences in the means (mean difference = 7.18 CI: 4.26 to 10.18) was very large (eta squared = 0.95). This shows that the discourse of the

extroverts was more lexically complex in online discussions. It is interesting to note that even though more words were produced by the extroverts in face-to-face discussions (please refer to *Table 4.2: Comparison of Total Words for the Extroverts and Introverts across Discussion Settings*), the lexical complexity shown by them was higher in online discussions. This suggests that the online environment may entail less repetition of words as the participants reflect before typing the messages.

For the introverts, they have also exhibited greater lexical range in their discourse in online discussions than in face-to-face discussions. However, the difference was not statistically significant, $t(3) = 3.78$, $p > 0.05$ (two-tailed). This may be due to the significantly fewer words produced by the introverts during discussions. In other words, significant findings could be gathered if more words have been gathered from the introverts. Despite that, the higher lexical complexity shown by both the extroverts and introverts in online discussions suggests that the online setting can be a conducive environment for eliciting more discourse which displays a wider range of vocabulary.

Within the same discussions setting, there was no statistically significant difference between the standardised type-token ratios of the extroverts and introverts. This could be that personality did not play a major role in affecting the range of vocabulary displayed. Language proficiency of the learners might have played a bigger role since more proficient learners were found to have a better grasp of vocabulary (Arslanyilmaz, 2012).

The following section reports the analysis of learners' language proficiency and their discourse which displays lexical complexity in face-to-face and online discussions.

4.5.1.2 The Influence of Learners' Language Proficiency

The standardised type-token ratios of the high-intermediate and low-intermediate ESL learners in each discussion are presented in Table 4.11. The learners' groups are indicated in parenthesis.

Table 4.11: Comparison of Standardised Type-Token Ratios for High-Intermediate and Low-Intermediate ESL Learners across Discussion Settings

Discussion	Standardised Type-token Ratios			
	Online		Face-to-face	
	<i>High-intermediate</i>	<i>Low-intermediate</i>	<i>High-intermediate</i>	<i>Low-intermediate</i>
1	71.4 (A)	68.83 (A)	62.2 (B)	62.17 (B)
2	70.64 (B)	72.17 (B)	64.73 (A)	- (A)
3	71.7 (A)	73.33 (A)	65.23 (B)	60.33 (B)
4	68.16 (B)	65.44 (B)	62.25 (A)	- (A)
Mean	70.48	69.94	63.60	61.25
Standard deviation	1.61	3.56	1.60	1.30

The paired-samples t-test from the IBM SPSS Statistics 20 software revealed a statistically significant difference in the standardised type-token ratios of the high-intermediate learners in online ($M = 70.48$, $SD = 1.61$) and face-to-face settings ($M = 63.60$, $SD = 1.60$), $t(3) = 8.33$, $p < 0.01$ (two-tailed). The magnitude of the differences in the means (mean difference = 6.88, 95% CI: 4.31 to 9.64) was very large (eta squared = 0.96) and this indicates that the high-intermediate learners showed wider vocabulary range in online discussions. Similar to Arslanyilmaz (2012), the more proficient learners also displayed discourse which showed higher lexical complexity than the less proficient low-intermediate learners (please refer to *Section 2.8: The Influence of Learners' Language Proficiency in Discussions* for details). For the low-intermediate learners, they have also exhibited greater lexical range in online discussions ($M = 69.94$, $SD = 3.56$) than in face-to-face discussions ($M = 61.25$, $SD = 1.30$) but the difference

was not statistically significant, $t(3) = 3.10$, $p > 0.05$ (two-tailed). The result may be due to the significantly lesser words they have produced during the discussions.

The high-intermediate learners have shown a wider range of lexical range compared to the low-intermediate learners in both face-to-face and online discussions. However, no statistically significant difference was found between the standardised type-token ratios of the high-intermediate and low-intermediate learners whether they were in a face-to-face or online environment.

The following section attempts to analyse and explain the combined effects of ESL learners' personality and language proficiency on their lexical complexity shown across discussion settings.

4.5.1.3 The Influence of Learners' Personality and Language Proficiency

Table 4.12 shows the standardised type-token ratios of the ESL learners with different personalities (extroverts and introverts) and language proficiency (high-intermediate and low-intermediate) in each discussion. The groups they belonged to are indicated in parenthesis.

Table 4.12: Comparison of Standardised Type-Token across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency

Discussion	Standardised Type-token Ratios							
	Online				Face-to-face			
	Introverts		Extroverts		Introverts		Extroverts	
	High	Low	High	Low	High	Low	High	Low
1	70.40 (A)	64.00 (A)	71.40 (A)	73.00 (A)	- (B)	60.50 (B)	62.44 (B)	63.50 (B)
2	69.20 (B)	71.50 (B)	71.83 (B)	71.33 (B)	66.00 (A)	- (A)	64.38 (A)	- (A)
3	71.33 (A)	75.00 (A)	71.43 (A)	73.00 (A)	62.00 (B)	67.00 (B)	64.67 (B)	55.50 (B)
4	66.33 (B)	68.00 (B)	68.92 (B)	64.20 (A)	- (A)	- (A)	62.26 (A)	- (A)
Mean	69.32	69.63	70.90	70.38	64.00	63.75	63.44	59.5
Standard deviation	2.17	4.71	1.33	4.20	2.83	4.60	1.26	5.66

(Note: Due to space constraint, the categories for high-intermediate and low-intermediate ESL learners are shortened to 'high' and 'low' respectively)

With reference to Table 4.12, the extroverts with high-intermediate language proficiency have shown the highest lexical complexity in the online discussion setting ($M = 70.90$, $SD = 1.33$). The lexical complexity displayed by them in the online environment was significantly greater than in the face-to-face condition, ($M = 63.44$, $SD = 1.26$), $t(3) = 11.71$, $p < 0.01$ (two-tailed). The magnitude of the differences in the means (mean difference = 7.46, 95% CI: 5.57 to 9.72) was very large (eta squared = 0.98). This means that the online setting could elicit greater lexical range from the extroverts with high-intermediate language proficiency.

Likewise, the other groups of learners (the extroverts with low-intermediate language proficiency as well as the introverts with high-intermediate and low-intermediate language proficiency) also displayed more lexically complex discourse in online discussions than in face-to-face discussions. However, the differences were not statistically significant. No statistically significant difference has also been found

among the learners with different personalities and language proficiency within the same discussion environment.

It may also be worthy to note that the extroverts with high-intermediate language proficiency have not shown the highest lexical complexity in face-to-face discussions despite having contributed the most words (please refer to *Table 4.4: Comparison of Total Words across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency*). The result may be due to the repetitive usage of words during face-to-face discussions. Further analysis of the discussion transcripts as well as the survey and online feedback session has been conducted and is reported in the following section.

4.5.2 Qualitative Analysis

4.5.2.1 Written vs. Spoken

From the quantitative findings, the participants generally displayed higher lexical complexity in online discussions. This may be due to the written form used in online discussions which is more formal and concise, thus it is more capable to elicit wider range of vocabulary than spoken language (Lapadat, 2002). Furthermore, Yates (2001) has found that the use of vocabulary in online discussions is more similar to writing than to speech.

Online discussions which involve typing are also self-paced and thus learners can have more time to observe, process, plan and edit their messages to bring about higher quality interlanguage (Ariza & Hancock, 2003; Krashen, 1985; Yates, 2001). Another reason is that the learners must express their attitudes such as agreement,

curiosity and boredom explicitly in online discussions and cannot rely on paralinguistic cues as in face-to-face discussions (Kiesler et al., 1984). Even though emoticons were used, the effect is incomparable to the facial expressions and body language that can be observed in face-to-face discussions (Wang & Woo, 2007). For more information on previous studies which have investigated ESL learners' lexical complexity in face-to-face and online discussions, please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence*.

In contrast, with barely enough time to go through all the lexical choices during face-to-face discussions, the learners tend to use the first words that come across their minds and this causes the use of vocabulary to be less varied (Chafe & Danielewicz, 1987). The spoken language used in face-to-face discussions is also more rapid, less formal and the lexical range is narrower compared to online discussions (Lapadat, 2002; Yates, 2001). As observed by Participant 19 (Group A) in the online feedback session of this study, the learners had the tendency to use more informal words like *stuff* and non-standard suffix *-lah* (e.g. *tolerate-lah*) when they were discussing face-to-face.

Lexical complexity is reduced when there is more repetition of words. In the face-to-face discussions of this research, more repetitions of words were found as the participants tried to recall what they have wanted to say or when they discussed the pronunciation of words and tried to pronounce the words correctly such as shown in the following dialogue:

- P1, Grp A Oh yea.. I think the most challenging part of learning English is maybe the pronunciation. Some of us.. We never found the word.. doesn't know how to pronounce like apa " D E B U T" Some pronounce it 'debut'. Some pronounce it 'debut, debut' then what else?*
- P2, Grp A 'debut'*

P1, Grp A 'debut'.. Then I found out it's pronounced as 'debut.'
P6, Grp A 'debut'
P2, Grp A Seriously right?
P1, Grp A Right teacher?(teacher nodded)
P6, Grp A) Also actually the correct pronunciation for biscuit is "biskit".
P2, Grp A Yea.. it's 'biskit'
P6, Grp A Do you know that?
P2, Grp A Same as 'b-a-n-a- n- a' – banana. It's not "banana"
P6, Grp A banana "b- a- n-a- n-a- a"
P2, Grp A Ok

Sometimes, the learners also mimicked the pronunciation of their friends by repeating the phrase. This repetition also influenced the lexical complexity of the learners in face-to-face discussions; especially the extroverts with high-intermediate language proficiency who have dominated the discussions. For instance:

P6, Grp A Ok.. I also started learning English when i was a little girl.
P1, Grp A "when I was a little girl"

In addition, the speakers also stuttered and paused more as they tried to retrieve the right word to express their ideas. However, when they were stuck, the other participants would help to complete the sentence. This can be seen in the excerpt below:

P1, Grp B I would like to start. Hmm... Having the... err... the... what..
The inconvenience of water actually err actually
P2, Grp B Disturbing

The above scenario was not observed in the online discussions carried out in this study. In online discussions, the participants usually post complete sentences and the others would not know the difficulty the creator had when constructing the message. When learners faced with the difficulty to find the right word, they were found to refer to other websites or utilise 'Google translate'. Learners can also refer to online translation or dictionary when they did not know certain words (Participant 6 from Group B). Thus, a number of learners felt that their vocabulary can be enhanced through online discussions (Participants 13, 18 and 23 from Group A, Participants 6, 17 and 22 from Group B).

This might also be a reason why the lexical complexity of the learners in online discussions was higher.

In comparison, the learners in face-to-face discussions could not resort to dictionary when they wanted to look up for a word. Even if a dictionary was brought along, it would be rather inconvenient and 'slow'. This is because face-to-face interactions require prompt responses and the checking of a word may take up the time for the others to respond. Unlike face-to-face discussions, online discussions have the luxury of time whereby learners can refer to online resources for help without taking up others' time and opportunities to respond. Thus, learners in face-to-face discussions usually depend on their friends for help when they are stuck in retrieving a suitable word. Sometimes, they would resort to strategies such as repeating the last word or phrase, pause or use gestures to get their friends to help. This further reduces the lexical complexity of the discourse displayed during face-to-face discussions. The implications for this significant finding can be found in *Section 5.3.3: Implications for pedagogy*.

4.6 Interactive Competence

Research question 4:

What is the difference in the interactive competence displayed by the ESL learners with different personality types (introverts and extroverts) and language proficiency levels (high-intermediate and low-intermediate) when interacting in the two different settings (face-to-face and online)?

This section looks at the interactive competence of the ESL learners in different discussion settings. When the learners are shown to have higher interactive competence,

it means that they have higher ability to interact using language functions (Fitze, 2006; Chun, 1994). The categories of language functions used in this study are adopted from Chun (1994) and are as shown below:

- 1) Provide or requests clarifications for the subject or task
- 2) Requests clarifications through statements or questions
- 3) Provides response to the other participants without substantiating it (e.g. “yes”, “perhaps”, “I don’t agree”)
- 4) Statements for social purposes (e.g. greetings, thanks, apologies, farewells)
- 5) Meta-communications: admonitions, invitation for participation, expression of feelings (interest, boredom. etc) about the discussion/topic, redirection to topic.

The following sections report the quantitative and qualitative findings for this last research question.

4.6.1 Quantitative Analysis

To evaluate the effect of the discussion environments on the ESL learners’ interactive competence during the discussions, the percentage of t-units displaying interactive competence for face-to-face and online discussion settings in 20 minutes was obtained and a paired-samples t-test was conducted on the totals by discussion condition. The totals are presented in Table 4.13; groups are indicated in parenthesis.

Table 4.13: Comparison of the Percentage of T-units Displaying Interactive Competence in Online and Face-to-Face Discussions

Discussion	Percentage of T-units Displaying Interactive Competence	
	Online	Face-to-face
1	12.05 (Group A)	12.42 (Group B)
2	15.42 (Group B)	3.76 (Group A)
3	14.03 (Group A)	11.18 (Group B)
4	9.89 (Group B)	3.84 (Group A)
Mean	12.85	7.80
Standard deviation	2.41	4.65

To determine if the ESL learners in online discussions displayed more interactive competence than in face-to-face discussions, the percentage of learners' contributions demonstrating interactive competence (i.e. as a percentage of the total number of student contributions) were first determined for each discussion and then compared across discussion settings. The paired-samples t-test revealed no statistically significant difference across discussion settings, $t(3) = 2.13$, $p > 0.05$ (two-tailed) even though the participating students showed about 30% more interactive competence in face-to-face discussions compared to online discussions. However, it should be noted that face-to-face discussions were dominated by the extroverts with high-intermediate language proficiency (please refer to *Table 4.4: Comparison of Total Words across Discussion Settings for ESL learners with Different Personalities and Language Proficiency*), thus the increase of interactive competence among the students cannot be related to discussion settings. This finding differed from Fitze (2006; please refer to *Section 2.6.2: Participation Style, Lexical Complexity and Interactive Competence* for details) which found that the discourse produced in online discussions contained a higher percentage of statements demonstrating interactive competence ($M = 18.70\%$, $SD = 0.06$) than the discourse produced in face-to-face discussions ($M = 7.35\%$, $SD = 0.06$). This difference found could be due to the different group composition. However, since details of the participants are not available from Fitze (2006), a further analysis of

students' personality and language proficiency on the discourse produced could not be carried out. Other research on this area which includes the analysis of the learners' personality and language proficiency is also rare and unobtainable.

The findings of this study have shown that the extroverted and more proficient ESL learners dominated the face-to-face discussions. So, when the learners' discourse which displayed interactive competence was found higher in face-to-face discussions, the medium cannot be given the credit. Instead, the result may be attributed to the personality and language proficiency of the learners. Thus, to further understand the effect of discussion settings on ESL learners' interactive competence, group composition (i.e. the personality and language proficiency of the learners) needs to be taken into account. The findings according to the learners' personality and language proficiency are explained in the following sections.

4.6.1.1 The Influence of Learners' Personality

To investigate the effect of personality on the ESL learners' interactive competence in different discussion environments, a paired-samples t-test was conducted on the percentage of learners' t-units displaying interactive competence in each discussion. The totals are presented in Table 4.14 and their groups are indicated in parenthesis.

Table 4.14: Comparison of the Percentage of T-units Displaying Interactive Competence by the Extroverts and Introverts across Discussion Settings

Discussion	Percentage of T-units Displaying Interactive Competence			
	Online		Face-to-face	
	<i>Introverts</i>	<i>Extroverts</i>	<i>Introverts</i>	<i>Extroverts</i>
1	11.66 (A)	12.44 (A)	24.13 (B)	26.81 (B)
2	16.60 (B)	14.33 (B)	0 (A)	15.03 (A)
3	11.52 (A)	16.33 (A)	22.92 (B)	21.79 (B)
4	15.31 (B)	4.469 (B)	5.56 (A)	9.80 (A)
Mean	13.77	11.89	13.15	18.35
Standard deviation	2.58	5.20	12.20	7.47

As shown in Table 4.14, the extroverts ($M = 18.35$, $SD = 7.47$) had more t-units which displayed interactive competence in face-to-face discussions than the introverts ($M = 13.15$, $SD = 12.20$). The difference in the means was 5.2, a 40% of the total t-units displaying interactive competence by the introverts in face-to-face discussions. Though the difference seemed big, it was not statistically significant, $t(3) = 1.53$, $p > 0.05$ (two-tailed).

In the online condition, the introverts ($M = 13.77$, $SD = 2.58$) took over the extroverts ($M = 11.89$, $SD = 5.20$) in using more t-units which displayed interactive competence. The difference in the means was 1.88, a 16% of the total t-unit exhibiting interactive competence by the extroverts in online discussions. The difference was also found to be not statistically significant, $t(3) = 0.79$, $p > 0.05$ (two-tailed).

Looking at the percentage of t-units displaying interactive competence by the introverts across discussion settings, no significant difference was found, $t(3) = 0.10$, $p > 0.05$ (two-tailed). Similarly, the extroverts have shown no significant difference in their interactive competence in face-to-face and online discussions, $t(3) = 2.40$, $p > 0.05$ (two-tailed).

After analysing the influence of the ESL learners' personality on their interactive competence in face-to-face and online discussions, the following part analysed the influence of another variable which is language proficiency.

4.6.1.2 The Influence of Learners' Language Proficiency

The percentage of t-units displaying interactive competence by the high-intermediate and low-intermediate ESL learners in face-to-face and online discussions is presented in Table 4.15. The learners' groups are indicated in parenthesis.

With reference to Table 4.15, the high-intermediate ESL learners ($M = 17.45$, $SD = 8.91$) showed a higher percentage of t-units displaying interactive competence than the low-intermediate learners ($M = 14.05$, $SD = 17.29$) in face-to-face discussions but the difference was not statistically significant, $t(3) = 0.33$, $p > 0.05$ (two-tailed).

Table 4.15: Comparison of the Percentage of T-units Displaying Interactive Competence by the High-Intermediate and Low-Intermediate ESL Learners across Discussion Settings

Discussion	Percentage of T-units Displaying Interactive Competence			
	Online		Face-to-face	
	<i>High-intermediate</i>	<i>Low-intermediate</i>	<i>High-intermediate</i>	<i>Low-intermediate</i>
1	11.13 (A)	12.97 (A)	30.14 (B)	20.79 (B)
2	9.86 (B)	20.51 (B)	15.03 (A)	0 (A)
3	6.32 (A)	21.10 (A)	9.29 (B)	35.42 (B)
4	6.17 (B)	13.61 (B)	15.35 (A)	0 (A)
Mean	8.37	17.05	17.45	14.05
Standard deviation	2.51	4.35	8.91	17.29

However, in online discussions, statistically significant difference was found between the high-intermediate ($M = 8.37$, $SD = 2.51$) ESL learners and the low-intermediate ($M = 17.05$, $SD = 4.35$) learners, $t(3) = 3.29$, $p < 0.05$ (two-tailed). The

mean difference was 8.68 with a 95% confidence interval ranging from 0.29 to 17.72. The eta squared statistic (.78) indicated a large effect size. This means that more t-units displaying interactive competence were observed in the discourse of the low-intermediate ESL learners. It is interesting that even though the low-intermediate learners' contribution of words (please refer to *Table 4.3: Comparison of Total Words for High-Intermediate and Low-Intermediate ESL Learners across Discussion Settings*) were significantly lesser than the high-intermediate learners in online discussions, their t-units which displayed interactive competence was significantly higher than the high-intermediate learners. This suggests that the discourse of the low-intermediate learners in online discussions consisted of more interactive functions such as *I agree, I don't think so* and less content.

In comparison of the low-intermediate learners' t-units which displayed interactive competence in different discussion environments, no significance difference has been found between online ($M = 17.05, SD = 4.35$) and face-to-face ($M = 14.05, SD = 17.29$) discussions, $t(3) = 0.73, p > 0.05$ (two-tailed). The same for the high-intermediate learners, no significance difference in the t-units which displayed interactive competence was found in face-to-face ($M = 17.45, SD = 8.91$) and online discussion ($M = 8.37, SD = 2.51$), $t(3) = 0.33, p > 0.05$ (two-tailed).

To understand the interactive patterns of the participants better, the following part looks into the participants' personalities and language proficiency.

4.6.1.3 The Influence of Learners' Personality and Language Proficiency

This part examines the influence of learners' personality and language proficiency in affecting their interactive competence in different discussion environments. The percentage of t-units displaying interactive competence by the ESL learners with different personalities (extroverts and introverts) and language proficiency (high-intermediate and low-intermediate) is presented in Table 4.16; the learners' groups are indicated in parenthesis.

Table 4.16: Comparison of the Percentage of T-units Displaying Interactive Competence across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency

Discussion	Percentage of T-units Displaying Interactive Competence							
	Online				Face-to-face			
	<i>Introverts</i>		<i>Extroverts</i>		<i>Introverts</i>		<i>Extroverts</i>	
	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>
1	14.33 (A)	9.00 (A)	7.94 (A)	12.98 (A)	20.00 (B)	4.13 (B)	10.14 (B)	16.67 (B)
2	5.03 (B)	26.25 (B)	13.89 (B)	14.77 (B)	0 (A)	0 (A)	15.03 (A)	0 (A)
3	6.67 (A)	15.56 (A)	6.03 (A)	26.64 (A)	4.17 (B)	18.75 (B)	5.12 (B)	16.67 (B)
4	7.44 (B)	23.18 (B)	4.89 (B)	4.05 (B)	5.56 (A)	0 (A)	9.80 (A)	0 (A)
Mean	8.37	18.50	8.19	14.61	7.43	5.72	10.02	8.33
Standard deviation	4.10	7.77	4.01	9.29	8.71	8.90	4.05	9.62

(Note: Due to space constraint, the categories for high-intermediate and low-intermediate ESL learners are shortened to 'high' and 'low' respectively)

Based on Table 4.16, the extroverts with high-intermediate language proficiency showed the highest percentage of t-units displaying interactive competence when they were in face-to-face discussions ($M = 10.02$, $SD = 4.05$). Even though the extroverts with high-intermediate language proficiency contributed the most number of words compared to all the other groups (as shown in Table 4.4: Comparison of Total Words

across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency), the paired-samples t-test showed no significant differences between their performance and the other learners who had different personalities and language proficiency. No significant difference has also been found with the percentage of t-units displaying interactive competence when the extroverts with high-intermediate language proficiency were in different discussion settings, $t(3) = 1.40$, $p > 0.05$ (two-tailed). This result may happen due to the more balanced participation among learners in online discussions. Another possible explanation maybe that the extroverts with high-intermediate language proficiency were the ones dominating the face-to-face discussions and they were actively speaking up, supporting each other and inviting for more participation from the rest using language functions that have increased their t-units which displayed interactive competence.

In contrast to the extroverts with high-intermediate language proficiency, the extroverts with low-intermediate language proficiency produced more t-units displaying interactive competence in online discussions ($M = 14.61$, $SD = 9.29$) than in face-to-face discussions ($M = 8.33$, $SD = 9.62$) but the findings was not statistically significant, $t(3) = 1.53$, $p > 0.05$ (two-tailed). Similarly, the introverts with high-intermediate language proficiency also showed more t-units displaying interactive competence when they discussed online ($M = 8.37$, $SD = 4.10$) than through face-to-face ($M = 7.43$, $SD = 8.71$). However, the difference was small and not significant, $t(3) = 0.31$, $p > 0.05$ (two-tailed).

Compared to the other groups, the introverts with low-intermediate language proficiency showed the biggest difference in the percentage of t-units displaying interactive competence when they were online and face-to-face (12.78%). The

percentage of their t-units displaying interactive competence was the highest (18.50%) in online discussions when compared to the other three groups and the lowest (5.72%) in face-to-face discussions when compared to the rest. However, the paired samples t-test has shown no significant difference, $t(3) = 1.82$, $p > 0.05$ (two-tailed) for the percentage of t-units displaying interactive competence by the introverts with low-intermediate language proficiency in face-to-face and online discussions.

The following section provides more information through qualitative analysis of the discussion transcripts and learners' comments in the online feedback session and survey.

4.6.2 Qualitative Analysis

4.6.2.1 Language Functions

All online members must use appropriate language and show courtesy although we cannot see each other.

(Participant 6 from Group B)

The above quote by Participant 6 from Group B gave an indication for the non-significant findings among the learners in different discussion settings. This is because the participants knew that they should use language functions to show their courtesy in face-to-face discussions where they can see each other as well as in online discussions even though they cannot see each other. Please refer to *Section 3.11.1: Quantitative Method* for the list of language functions.

Nevertheless, online discussions observed more interactive competence displayed by learners even though the difference with face-to-face discussions was not statistically significant (please refer to *Table 4.13: Comparison of the Percentage of T-units Displaying Interactive Competence in Online and Face-To-Face Discussions*). This may be due to the setting of the online discussions in which the participants can perform many of the language functions by showing their agreement or disagreement and request clarifications easily. They can track back previous messages and reply. Moreover, the previous message can be easily quoted in the new message that one was going to compose and this increased the chances for the participants to display their interactive competence. As shown in the excerpt below, the reply to a particular person can be accompanied by the previous message that was being replied to.

P16, Grp A *(P24, Grp A) wrote:yes! i agreed with P16, Grp A... 😊*
hehe , thanks 😊

In the online setting, learners were happy when their ideas were quoted and supported by the other participants. This encouraged even more display of interactive competence in online discussions.

However, Participant 14 from Group A hoped that the feedback could be more valuable and beneficial. This might suggest that not all the messages using the language functions and displaying interactive competence in the online discussions were deemed useful and wanted.

The next section provides more insights by examining the group dynamics, processes and development during the discussion process.

4.7 Group Dynamics, Processes and Development

Comparing the discussions of both groups, the face-to-face discussions of Group A seemed more intimidating than Group B. This is because there was a better rapport or better level of friendship among students numbered 1, 2 and 6 in Group A. For example, when student numbered 3 (Group A) gave a differing opinion, she was refuted by students numbered 1, 2 and 6 continuously. Students numbered 1, 2 and 6 backed each other up in the arguments and seemed to be working as a group against student numbered 3. This seemed to discourage student numbered 3 from voicing out her opinion in the next face-to-face discussion. It could also discourage the other students from expressing their ideas even though students numbered 1, 2 and 6 have asked many questions and also invited others to respond during the face-to-face discussions. This could also explain the results for research question 1 in which low-intermediate ESL learners from Group A contributed very few words during face-to-face discussions. However, this would not be influencing the reliability and validity of this research as the influence of such group processes influenced both types of learners; extroverts and introverts. Furthermore, such development might be normal in face-to-face discussions.

From the survey (please refer to Appendix 8) given to the participants after the discussions, 50% of the students preferred having fewer number of students in face-to-face discussions and a few students also suggested having a larger number of students in online discussions. Thus, group size could also influence the participation and discourse of the students and future research could look into this.

Before summing up, the main findings gathered from different methods are reported in the following section.

4.8 General Findings from Different Methods

The findings of this research were gathered from the quasi-experiment, observation, survey and online feedback session. Using these different instruments can help to obtain more reliable and insightful findings for this study (please refer to *Section 3.12: Triangulation* for more explanation). The following parts will explain the general findings from each of the different methods used in this study.

4.8.1 Quasi-Experiment

Quasi-experiment is the main method used to gather findings for the research questions of this study. The way the data were collected and analysed can be seen in *Section 3.10: Data Collection and Recording* and *Section 3.11: Data Analysis*. Through the experiment, it was found that the medium of discussion did play an important role in inducing different kinds of messages and participation style among different kinds of learners.

In a face-to-face environment, the extroverts with better language proficiency dominated the large group discussions and showed more interactive competence. This differed from the online discussions which observed more equal participation among the learners and allowed the less proficient participants to show more interactive competence in their discourse.

Compared to face-to-face discussions, the more introverted and less proficient ESL learners have also shown more active participation and contributed more words when they were discussing in the online setting. Irrespective of the participants'

differences in personality and language proficiency, higher lexical complexity was also observed in the learners' exchanges in online discussions.

4.8.2 Observation

In this study, the researcher observed the discussion process and the participants' responses during the quasi-experiment. The data from the observation together with the comments given in the survey (please refer to *Section 4.8.3: Survey on the Views of Face-to-face and Online Discussions*) and online feedback session (please see *Section 4.8.4: Online Feedback Session*) were compared and analysed in a qualitative manner. The themes were obtained using the grounded theory's constant comparative and inductive method of analysis strategies method (please refer to *Section 3.11.2: Qualitative Method* for explanation). The themes that were gathered from the observation process were confidence, motivation, noise, the affective domain, written vs. spoken language and language functions. In addition, the observation of group dynamics, processes and development was also found and reported in *Section 4.7: Group Dynamics, Processes and Development*.

4.8.3 Survey on the Views of Face-to-Face and Online Discussions

A survey on the participants' views of face-to-face and online discussions was administered after the quasi-experiment (please refer to Appendix 8, *Section 3.8.2: Survey on the Views of Face-to-face and Online Discussions* and *Section 3.11.1: Quantitative Method*). This was done to triangulate the data and give better support for the findings through information about the learners' backgrounds, preferences, experience and views of the discussion environments.

In the survey, Section A gathered data of the participants' particulars. The particulars included basic information such as the participant's name and class. These data were gathered to help the researcher to link the participants' responses to their personalities and language proficiency. Following that, Section B enquired learners' perceptions of English language. All but only one participant (Participant 21, Group A) felt that English language was important. Almost 90% of the participants also found English language to be fun and interesting; only five learners found English language to be difficult.

Section C of this survey enquired the learners' familiarity with the Internet. As expected, this group of Generation Y participants was familiar with the use of Internet and used it at least once a month. More than half of the participants even used it every day. Section D enquired the learners' reasons for choosing a face-to-face or online environment as their preferred discussion settings and enquired learners' suggestions to improve both discussion environments. The reasons given in this section were analysed in a qualitative manner and reported together with the findings from observation (please refer to *Section 4.8.2: Observation*) and online feedback session (please see *Section 4.8.4: Online Feedback Session*). The themes found from this section were mostly related to confidence, motivation and the affective domain.

In Section D, the most popular suggestions given by the participants for improving face-to-face discussions were introducing smaller groups (suggested by 10 participants) and encouraging more balanced participation among the members so that it would not be dominated by the same people (suggested by 10 participants). There were also three participants who mentioned that they needed more guidance in face-to-face

discussions. For online discussions, there were more learners (15 participants) who wished that it could be held more regularly. Twelve of the participants also suggested that the researcher should include more participants in the online discussions so that they can learn more ‘precious ideas’.

The last section, Section E, contained 15 statements which required the participants to indicate their views based on a five-point Likert-type response scale, ranging from the extreme responses of ‘strongly agree’ to ‘strongly disagree’. The results of the participants’ responses are shown in Table 4.17.

Table 4.17: Average Ratings on the Questionnaire Items (N=46)

Item	Extroverts	Introverts	High	Low	EH	EL	IH	IL	TOTAL
1	2.2	2.1	2.5	1.9	2.8	1.6	2.1	2.1	2.2
2	2.2	1.8	2.0	1.9	2.3	2.0	1.7	1.8	2.0
3	2.1	1.9	2.1	1.9	2.4	1.7	1.8	2.1	2.0
4	2.4	2.3	2.5	2.1	2.6	2.1	2.3	2.2	2.3
5	2.5	2.6	2.7	2.4	2.6	2.3	2.8	2.4	2.5
6	2.3	3.2	2.8	2.8	2.4	2.2	3.1	3.3	2.8
7	2.0	1.8	2.1	1.6	2.3	1.6	1.9	1.7	1.9
8	2.1	2.9	2.3	2.8	2.3	2.0	2.3	3.5	2.5
9	2.1	2.2	2.3	2.0	2.3	1.9	2.3	2.0	2.1
10	1.7	1.6	1.8	1.6	1.9	1.5	1.6	1.7	1.7
11	2.0	1.8	1.8	2.0	1.7	2.4	1.8	1.8	1.9
12	2.0	2.4	2.2	2.2	1.8	2.3	2.6	2.2	2.2
13	1.9	1.6	1.7	1.8	1.9	1.9	1.5	1.8	1.8
14	2.7	3.0	2.6	3.1	2.6	2.8	2.7	3.3	2.8
15	1.8	1.5	2.0	1.3	2.2	1.4	1.9	1.2	1.7

Note:

- 5 Strongly Disagree, 4 Disagree, 3 Not Sure, 2 Agree, 1 Strongly Agree
- High refers to high-intermediate language learners;
Low refers to low-intermediate language learners
EH refers to Extroverts with high-intermediate language proficiency
EL refers to extroverts with low-intermediate language proficiency
IH refers to introverts with high-intermediate language proficiency
IL refers to introverts with low-intermediate language proficiency

Referring to Appendix 8, the first item, “I prefer online discussions to face-to-face discussions” elicited positive response from the participants especially among the

extroverts with low-intermediate language proficiency (a mean score of 1.6). This suggests that the online environment may have provided a more conducive setting for the learners. With reference to items 2 and 4 in the survey, the participants agreed to the statements that they preferred typing or listening rather than speaking. Apart from that, the ESL learners in this study also agreed that the feedback they received in online discussions motivated them to give more responses (item 13, a mean score of 1.8). These reasons may answer why the participants in this study preferred online discussions to face-to-face discussions.

From item 8, the participants were found to be familiar with the online discussions (a mean score of 2.1) and face-to-face discussions (a mean score of 2.5). However, it was surprising to find that the introverts with low-intermediate language proficiency did not agree that they experienced face-to-face discussions often in the ESL classes. Perhaps their personality and language proficiency have inhibited them from participating in face-to-face discussions. Another possible explanation was that the ESL classes that they have experienced were usually teacher-centred.

With regards to group size, item 3 found that the participants wished to have more students participating in the online discussions (a mean score of 2.0). On the other hand, the participants preferred face-to-face discussions which have smaller number of participants (a mean score of 2.5). As discussed in *Section 4.3.2.1: Confidence*, the learners felt more confident when they spoke in front of fewer people in small groups. Apart from that, smaller groups could also encourage more balanced participation and effective face-to-face discussions (Pollock, Hamann & Wilson, 2011). Even though the researcher of this study understood the benefits of small group discussions, large group discussions were held in this study to find out ways to promote equal participation

among the learners in a large-class discussion setting. Other reasons for including 24 participants in a group were explained in *Section 3.4: Participants*.

The learners' responses for item 6 have also confirmed the reliability of the Styles Analysis Survey (SAS) which has been used to assess learners' personality. The extroverts generally agreed that they belonged to the extroverts group (a mean score of 2.3) while the introverts were not quite sure about the statement (a mean score of 3.2).

Apart from that, the choice of the venue for online and face-to-face discussions was also found to be conducive. The computer laboratory was agreed to be a suitable place for online discussions (item 10; a mean score of 1.7) and the meeting room was also deemed appropriate for face-to-face discussions (item 11; a mean score of 1.9). Noise seemed to appear in both online and face-to-face discussions as the participants' responses were uncertain when asked if they were more easily distracted in face-to-face discussions than online discussions (item 14, a mean score of 2.6 to 3.3).

Despite the aim of encouraging learner-learner discussions, a majority of the participants indicated that they wished for more guidance from the teacher (item 18). Only two of the 45 responses disagreed with the statement. This finding is similar to Son (2002) who also found that the learners wished for more involvement from their teacher in providing clarification and feedback. The need for guidance seemed more apparent among the learners who had lower language proficiency (a mean score of 1.3) and thus teachers would need to pay more attention to this group of learners.

Thus far, this study has also found that the online environment may be a better option for holding large-class discussions while the ESL learners generally need more

guidance in face-to-face condition. The ways to encourage equal participation among ESL learners in whole-class face-to-face discussions are suggested in *Section 5.3.3: Implications for Pedagogy*.

4.8.4 Online Feedback Session

In this study, the online feedback session was carried out after the quasi-experiment at the website forum-motion.com to elicit more detailed and meaningful data which were then analysed qualitatively (please refer to *Section 3.11.2: Qualitative Method*). The data from the online feedback session were compared and analysed together with the observation notes (please refer to *Section 4.8.2: Observation*) and comments given in the survey (please refer to *Section 4.8.3: Survey on the Views of Face-to-face and Online Discussions*). The themes that were retrieved were confidence, motivation, the affective domain, and language functions.

4.9 Conclusion

In sum, the results of the quasi-experiment is similar to Fitze (2006) and Warschauer (1997) which found that the online environment can elicit more words and more discourse which displayed higher lexical complexity among the ESL learners. However, this study found that the result was more significant among the introverts and the less proficient learners. In online discussions, the participation of the ESL learners was also found to be more balanced and the less proficient learners have also shown better interactive competence.

In this study, it was also surprising to learn that the other online resources such as online dictionary and 'Google translate' can help the learners to discuss in the online setting. Thus, these tools can be utilised to assist learners in increasing their range of vocabulary and participate in the discussions more effectively. The learners have also commented that they were more confident and motivated to engage themselves in online discussions. Thus, the online setting can be a good discussion environment especially for the introverts and the less proficient learners.

However, as acknowledged by most of the participants in this study, face-to-face discussions were also important for the real world needs. Unfortunately the less proficient and introverted learners found face-to-face discussions to be intimidating and was afraid to participate actively. Thus, measures need to be taken so that these learners can be more confident and motivated to take part in face-to-face discussions. Implications have been derived from the findings of this study and are explained in the following chapter, Chapter 5.

CHAPTER FIVE

CONCLUSIONS

5.1 Overview

In addition to the traditional face-to-face communication, the advent of computers has enabled a new way of communication to be introduced (Tam, 2009). Now, discussions can be held online or in a computer-mediated communication (CMC) context which is convenient and effective in observing ESL learners' active and balanced participation. The quality of language learning can also be improved through the use of a wider range of vocabulary and language functions (Arslanyilmaz, 2012; Chapelle, 2001; Fitze, 2006; Gonzolez-Lloret, 2003; Warschauer, 1996). This study has found that it is indeed true especially to the introverted ESL learners and those who have lower language proficiency.

This study has found additional observations to the discussions held in different settings (online and face-to-face) among the ESL learners with different personalities and levels of language proficiency. Apart from that, this study also presented more details to Foulger's (2004) *Ecological Model of Communication* framework by giving more information on the interrelationship among the medium, language and participants who can be the creator or consumer of a message (please refer to *Section 2.4.6: The Ecological Model of Communication* for details). With regard to the medium, this study looked at face-to-face and online settings while the individual differences of the participants focused on their personality and language proficiency. The language aspects that were looked into included the learners' contribution of words, lexical

complexity and interactive competence. SLA theories such as Krashen's affective hypothesis (1987), Long's interaction hypothesis (1996) and Swain's Output Hypothesis (1995) were some of the theories that were referred to in this study (please see *Section 2.2: The Role of Discussions in Second Language Acquisition*). Overall, this study has pointed out the need to explore learners' personality and language proficiency in their development of second language in different discussion settings.

Noting the gap in the current literature (please refer to *Chapter 1.3: Statement of Problem*) and shortcomings of Fitze's (2006) study in which this study was modelled after, this study took into consideration of the limitations which could affect the learners' linguistic output when developing the research design of this study. The variables involving the learners such as age, gender, personalities, language proficiency level, group size, computer and keyboard skills were controlled. Despite that, this study was still limited in scope as explained in *Section 1.7: Limitations of study*.

To control the intervening variables caused by the differences among the learners, this study employed purposive sampling method in the selection of the participants. Equal number of participants with different personalities (introverts and extroverts) and language proficiency (high-intermediate and low-intermediate) were selected for this study. They participated in a large group discussion together. As reviewed in Chapter 2, the mixed-ability groups were favoured as it can promote SLA (Blake, 2000; Boulima, 1999; Pellettieri, 2000; Varonis & Gass, 1985). All the selected participants participated in two face-to-face discussions and two online discussions.

The mixed-method approach used in this study employed the concurrent transformative design in which quantitative and qualitative data were gathered from the

stage of data collection to data analysis (please refer to *Section 3.6: Research Design/Method* for details). In this study, the quantitative method was used to collect and analyse the data gathered from the quasi-experiment and the survey carried out after the experiment. Meanwhile, qualitative approach was used in the collection and analysis of the observation held during the experiment, the online feedback session and the comments given by the participants in the survey given after the experiment.

The repeated measure of the quasi-experiments on two matched-samples groups (Group A and Group B) was used to compare the discourse and participation style of the ESL learners in different discussion settings. This study also conducted further investigation by looking at the way different learners with different personalities and language proficiency interacted in different discussion environments. The findings can offer ESL teachers a better understanding of the effects of a particular discussion medium on the language produced by different types of learners during group discussions. New perspectives on the ways second language teaching and learning process can be made more effective will be discussed in *Section 5.3.3: Implications for Pedagogy*.

5.2 Summary of Findings

Generally, the finding of this study is in line with Foulger's *Ecological Model of the Communication Process* (2004) which claimed that the medium played a role in influencing the messages of certain group of learners more than the others.

With reference to research question 1, participants contributed more words in the online setting ($M = 2009.25$, $SD = 601.65$) than in the face-to-face environment ($M =$

1721.25, $SD = 218.48$) but the result was not statistically significant, $t(3) = 1.27$, $p > 0.05$ (two-tailed). This finding is found similar to Fitze (2006).

Further investigation at learner's personality found that the extroverts produced significantly more words ($M = 1506.50$, $SD = 325.13$) than the introverts ($M = 214.75$, $SD = 218.25$) in face-to-face discussions, $t(3) = -5.08$, $p < 0.05$ (two-tailed). In other words, the introverts produced significantly lesser words in face-to-face condition. This could be due to the nature of the face-to-face condition in which immediate response was anticipated and this created more anxiety and higher affective filter for the introverts (Hamat, 2008; Jonassen, 1994). Thus, it was not surprising that the introverts were found to contribute significantly more words in the online discussions ($M = 810.75$, $SD = 254.14$) than in face-to-face discussions ($M = 214.75$, $SD = 218.25$), $t(3) = 3.18$, $p = 0.05$ (two-tailed). With more active participation in the online discussions, the introverts are believed to be able to gain more comprehensible input, noticing of form, negotiation of meaning and comprehensible output (Long, 1996; Swain, 1995).

Apart from personality, the language proficiency of the learners was also found to play a big influence on the learners' production of words in different discussion settings. In both online and face-to-face discussions, the total number of words produced by the high-intermediate learners was found to be significantly higher than the low-intermediate learners. While the more proficient language learners did not show significant differences in their contribution of words in online ($M = 215.04$, $SD = 147.09$) and face-to-face ($M = 241.92$, $SD = 147.09$) settings, the less proficient ESL learners produced significantly more words in online discussions ($M = 59.92$, $SD = 83.12$) than when they were in face-to-face discussions ($M = 22.48$, $SD = 104.87$). This

shows that the online discussion environment is more conducive for the less proficient ESL learners to practise using the language.

When the variables of personality and language proficiency were combined for data analysis, the extroverts with better language proficiency were found to contribute the most number of words irrespective of discussion settings and their contribution of words was significantly more in face-to-face discussions ($M = 1393.3$, $SD = 407.6$) than in online discussions ($M = 772.5$, $SD = 330.8$), $t(3) = 8.04$, $p < 0.01$ (two-tailed). In contrast to the extroverts with high-intermediate language proficiency, the extroverts with low-intermediate language proficiency, the introverts with high-intermediate language proficiency and the introverts with low-intermediate language proficiency contributed more words in online discussions than in face-to-face discussions. This suggests that the online discussion environment may be more suitable for the learners with introverted personality and lower level of language proficiency. As conveyed by the participants who belonged to the introverts and lower language proficiency group in the survey and online feedback session, they felt more confident to express themselves in online discussions as they can ponder for some time before responding and can 'speak' freely without interruption. Moreover, they did not see the audience's face and thus need not be worried of objections and other people's reactions. In contrast, they felt more nervous, shy and awkward in face-to-face interactions. They also expressed in the survey and online feedback session that they found it hard to speak their minds in a large group. Thus it is not surprising that more than 80% of them indicated their preference for online discussions and even wished for more participants in the online discussions. Despite that, they acknowledged the importance of face-to-face interactions and hoped to improve their performance in face-to-face discussions. They suggested that small group discussions would be better for them to start with as they felt more

confident in small groupings.

Motivating the learners with introverted personality and lower language proficiency would also be a good move to encourage them to speak confidently in face-to-face discussions. Participant 24 (Group B) was a good example. She was an introverted learner with low-intermediate language proficiency but she has given the most active responses among the group of low-intermediate introverted learners in face-to-face discussions. She has even affected the data (as shown in *Table 4.4: Comparison of Total Words across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency*) of the low-intermediate introverted learners to show more production of words than the extroverted low-intermediate and introverted high-intermediate learners. This is because she knew the importance of speaking English and was motivated. From the researcher's observation, the rapport of the students can also motivate or demotivate the participants in the discussions and future research could look into this area (please see *Section 4.7: Group Dynamics, Processes and Development* for details).

With regard to research question 2, a paired-samples t-test using the IBM SPSS Statistics 20 software on the gini coefficient scores gathered from face-to-face and online discussions showed that the online environment encouraged more balanced participation among the ESL learners. Further analysis which looked into the personality and language proficiency of the learners showed the same result. This result was anticipated as research question 1 had found more contribution of words by all different groups of learners in online discussions. The discovery of more balanced participation in online discussions is similar to the findings of Warschauer (1996) and Fitze (2006). However, different from Fitze's (2006) study which only found more

equal participation in online discussions for one of the two groups, the present study found more balanced participation in online discussions for both of the groups. This study also found that face-to-face discussions were dominated by the extroverts who were also more proficient ESL learners. Though having more opportunities to talk, these learners actually disliked their dominance and hoped that the others can join in.

As discussed, the extroverts with high-intermediate language proficiency were the ones who have contributed the most number of words in both face-to-face and online discussions. Further investigation also found that the group with extroverted high-intermediate language proficiency learners also showed the most balanced participation in both types of discussions when compared to the other groups. This means that they were generally more active in both types of discussions and their good command of the language and extroverted personality may be of help. On the contrary, the introverted high-intermediate and the introverted low-intermediate ESL learners showed the most unequal participation style in face-to-face discussions. The imbalanced participation among the introverted learners suggests that there were some learners who were more nervous to speak up than the others when they were in a face-to-face environment.

In online discussions, the introverts and extroverts with low-intermediate language proficiency showed the least balanced participation. This may be due to their lower grasp of the target language which has inhibited them from participating as actively as the other more proficient learners. Despite that, they still showed more balanced participation when they were in online discussions than in face-to-face discussions. This indicates that there were more learners with low-intermediate language proficiency contributing online than face-to-face and thus showing more

balanced participation in the online setting. The findings also suggest that the language proficiency of the learners may play a bigger role than their personality in influencing their performance during online discussions. The influence of learners' personality has reduced especially for the introverts as they confessed in the online feedback session that they were less anxious and more ready to contribute in online discussions.

More balanced participation in online discussions can be observed because of the nature of the medium which allows the learners to respond simultaneously in a less threatening environment. Even though learners can produce words faster in face-to-face interactions, the turn taking process and the "threatening" aspect have hindered participation from the introverts and caused domination by the extroverts (Simpson, 2005; Smith, 2003). In the survey and online feedback session, the participants in this study have thus given more positive response to the use of online discussions.

To encourage learners to be more active in face-to-face discussions, perhaps the participants can be given more time to prepare beforehand so that they will feel more confident. Another suggestion was to create an online synchronous discussion to explicitly talk about the importance of spontaneous face-to-face interactions and the usefulness of face-to-face discussions. This has been found to be able to change learners' perception towards certain mode of discussion.

On lexical complexity, the findings revealed that the discourse produced by the students in online discussions ($M = 70.17$, $SD = 28.53$) exhibited a greater lexical range and wider range of vocabulary than the discourse produced in face-to-face discussions ($M = 62.50$, $SD = 36.36$). This finding is similar to the studies conducted by Warschauer (1996) and Fitze (2006). In online discussions, more lexical complexity can be observed

as the learners conveyed their emotions and ideas more explicitly when non-verbal communications such as facial expressions, body language and tone of voice were absent (Fitze, 2006).

When the personality and language proficiency of the participants were looked into, the discourse of the extroverts and the high-intermediate ESL learners were found to show statistically more lexical complexity in online discussions than in face-to-face discussions. The introverts and the low-intermediate learners also exhibited a greater lexical range in their discourse in online discussions than in face-to-face discussions but the difference was not statistically significant. This may be due to the significantly lesser words they have produced during the discussions. Despite that, the findings have shown that the online setting can elicit a wider range of vocabulary from the learners with different personalities and language proficiency levels.

Discourse showing higher lexical complexity can be observed in online discussions as the online discussions utilised the more formal written form which was more apt in eliciting a wider range of vocabulary than spoken language. In addition, the members in online discussions cannot rely on paralinguistic cues as in face-to-face discussions and they had to convey their attitudes like curiosity, agreement and boredom explicitly (Kiesler et al., 1984). Even though emoticons can be used, the effect cannot be compared to the facial expressions and body language that can be seen in face-to-face discussions (Wang & Woo, 2007).

Apart from that, it is also worthwhile to note that the extroverts with high-intermediate language proficiency have shown the highest lexical complexity in online discussions but not in face-to-face discussions in which they have contributed the most

words (please refer to *Table 4.4: Comparison of Total Words across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency*). One of the reasons was that there was more repetitive usage of words during face-to-face discussions and has thus caused the learners' discourse to show higher lexical complexity in online discussions. The analysis of the transcripts showed that there was indeed more repetitions of words in face-to-face discussions as the participants stuttered and paused more often when they tried to retrieve the right words to express their ideas, pronounce the words correctly or mimic and discuss the pronunciation of their friends. In other words, the different skills involved in face-to-face and online discussions might have played a role in influencing the lexical complexity of the learners' discourse. However, it should again be reminded that this study has chosen to compare face-to-face and online discussions even though different skills were involved because of their similarities which have been mentioned in *Section 1.2.1: Face-to-face and Online Discussions*.

In contrast with face-to-face discussions, the participants in online discussions usually posted more complete sentences. Apart from that, the consumers of the messages would also not know the difficulty that the creator were facing when composing messages in online environment. In the process of composing messages, the ESL learners also had more time to monitor their use of language as immediate response was not anticipated like in a face-to-face environment. These differences could have caused learners to display higher lexical complexity in online settings. According to Krashen's (1977) monitor hypothesis, sufficient time is needed to enable learners to apply the rules of language but individual differences among learners would also play a role.

In the experiment carried out, the researcher observed that the participants would refer to other websites, online dictionary or utilise ‘Google translate’ when they had difficulty understanding a vocabulary or finding the right word to express their opinions. Thus, a number of learners felt that online discussions can help to increase their lexical range. This might also be a reason why the lexical complexity of the learners in online discussions was higher.

In relation to the last research question on interactive competence, the findings revealed that there was no statistically significant difference across discussion settings, $t(3) = 2.13$, $p > 0.05$ (two-tailed) even though 30% more interactive competence was found in face-to-face discussions. However, it is important to note that the increase of interactive competence among the students cannot be related to the discussion setting as the face-to-face discussions were dominated by the extroverts with high-intermediate language proficiency (please refer to *Table 4.4: Comparison of Total Words across Discussion Settings for ESL Learners with Different Personalities and Language Proficiency*).

The finding of this last research question is different from Fitze (2006) in which more interactive competence was found in the discourse of online discussions rather than in face-to-face discussions. The difference could be attributed to the difference in group composition. However, the details of the participants such as the learners’ personality and language proficiency were unavailable in Fitze (2006) and thus could not provide more information for a better understanding of the discrepancy.

In this study, the personality and language proficiency of the participants were taken into account. The low-intermediate ESL learners have surprisingly shown more t-

units displaying interactive competence even though their contribution of words (please refer to *Table 4.3: Comparison of Total Words for High-Intermediate and Low-Intermediate ESL Learners across Discussion Settings*) were significantly lesser than the high-intermediate learners in online discussions. This indicates that the discourse of the low-intermediate learners in online discussions consisted of less content and more interactive functions such as *I agree*, *I don't think so* and *thank you*. The online setting may have provided a more convenient platform to display interactive competence as the participants can easily track back previous messages and quote them in the new message that they were going to compose. With this setting, the participants can agree, disagree or display other language functions more effectively. Learners felt happy when their messages were quoted and supported by their peers. This encouraged even more display of interactive competence in online discussions. However, one of the participants hoped that the feedback can be more informative and beneficial. This implies that the messages performing language functions and displaying interactive competence in the online discussions may not be well received by some learners as they may prefer more valuable content.

In face-to-face discussions, no significant difference was found between the high-intermediate ESL learners ($M = 17.45$, $SD = 8.91$) and the low-intermediate learners ($M = 14.05$, $SD = 17.29$) in their t-units which displayed interactive competence. Apart from that, no significant difference was also found in the percentage of t-units displaying interactive competence by the introverts and extroverts across discussion settings. When the combined variables of personality and language proficiency were examined, no statistical significant result was obtained as well. The non-significant findings among the learners in different discussion settings may occur due to the small sample size as well as the perceptions of the learners. As expressed in

the online feedback session, the participants knew that they needed to use appropriate language functions (please refer to *Section 4.6.2.1: Language Functions*) to show their courtesy whether they could or could not see their audiences in both face-to-face and online discussions.

All in all, this study has found significant findings which have valuable implications for ESL in terms of theory, research and pedagogy. The following table, Table 5.1 shows the summary of findings obtained in this study.

The following section will conclude and explain the implications of this study.

University of Malaya

Table 5.1: The Use of English Language among ESL Learners with Different Personalities and Language Proficiency in Face-to-Face and Online Discussions

The Use of English as a Second Language (ESL)	
interrupted/enhanced by affective domain, group dynamics, noise (interruption)	
Face-to-Face (F2F)	Online
- dominated by the extroverts with high-intermediate language proficiency	- more balanced participation - higher lexical complexity than in F2F settings
<p>Personality</p> <p><u>Extroverts:</u></p> <ul style="list-style-type: none"> - contributed more words and showed more interactive competence than the introverts <p><u>Introverts:</u></p> <ul style="list-style-type: none"> - produced fewer words than in online settings 	<p>Personality</p> <p><u>Extroverts:</u></p> <ul style="list-style-type: none"> - more balanced participation and higher lexical complexity than in F2F settings <p><u>Introverts:</u></p> <ul style="list-style-type: none"> - more contribution of words and more balanced participation than in F2F settings
<p>Language Proficiency</p> <p><u>High-intermediate:</u></p> <ul style="list-style-type: none"> - contributed more words than the low-intermediate learners - showed lower lexical complexity than in online settings <p><u>Low-intermediate:</u></p> <ul style="list-style-type: none"> - showed lesser contribution of words than in online settings 	<p>Language Proficiency</p> <p><u>High-intermediate:</u></p> <ul style="list-style-type: none"> - more balanced participation, higher lexical complexity than in F2F <p><u>Low-intermediate:</u></p> <ul style="list-style-type: none"> - more balanced participation, more contribution of words and more interactive competence than in F2F - higher interactive competence than the high-intermediate learners
<p>Personality & Language Proficiency</p> <p><u>Extroverts, high-intermediate:</u></p> <ul style="list-style-type: none"> - contributed the most number of words among the groups <p><u>Extroverts, low-intermediate</u></p> <ul style="list-style-type: none"> - contributed fewer words than in online discussions <p><u>Introverts, high-intermediate</u></p> <ul style="list-style-type: none"> - contributed fewer words than in online discussions <p><u>Introverts, low-intermediate</u></p> <ul style="list-style-type: none"> - contributed fewer words than in online discussions 	<p>Personality & Language Proficiency</p> <p><u>Extroverts, high-intermediate:</u></p> <ul style="list-style-type: none"> - most contribution of words, highest lexical complexity and interactive competence among the groups - higher lexical complexity and more balanced participation than in F2F <p><u>Extroverts, low-intermediate</u></p> <ul style="list-style-type: none"> - contributed more words than in F2F <p><u>Introverts, high-intermediate</u></p> <ul style="list-style-type: none"> - contributed more words and showed more balanced participation than in F2F <p><u>Introverts, low-intermediate</u></p> <ul style="list-style-type: none"> - contributed the least number of words - more balanced participation than in F2F

5.3 Conclusion and Implications

Referring to the previous section and Table 5.1 which summarise the findings of this study, it can be concluded that the use of the online setting can be very helpful in balancing the participation of the learners and eliciting more contribution of words and more discourse that displays higher lexical complexity; especially among the introverts and the less proficient ESL learners. In the online discussions, the less proficient learners have also shown better interactive competence. The empirical evidence from this experimental study has shown that the online environment can be a good alternative platform for discussions to be held. Basing on Foulger's (2004) *Ecological Model of the Communication Process* and the SLA theories, the communication process in discussions can be made more effective in the synchronous online medium as the learners' affective filter was lower and the participants were thus more confident and motivated to engage themselves with the interactive language practice.

In this study, it was also surprising to find that other online resources such as online dictionary and 'Google translate' have helped some of the participants in their online discussions. Thus, these tools can be exploited to increase the learners' range of vocabulary and motivate them to actively use the target language for more comprehensible input, negotiation of meaning, noticing of form and comprehensible output (Krashen, 1987; Long, 1996; Swain, 1995).

Although the online setting is beneficial for language learning, it should not be the only medium for discussions. This is because face-to-face discussions are crucial for the real world needs and its importance has also been acknowledged by most of the participants in this study. Favoured mainly by the more proficient extroverted learners

but found intimidating by the others, measures need to be taken so that the less proficient and introverted learners can also feel more confident to take part in face-to-face discussions actively.

Having learned that different discussion environments can garner different types of participation styles and discourse among different types of learners, language instructors would thus need to pay more attention to the discussion environments and the unique differences among the learners for more effective discussions that can promote second language learning. Implications that can be derived from the findings of this study are further elaborated in the following sections.

5.3.1 Implications for SLA Theory

This study has contributed to the current literature by providing more information about the relationship between the medium, participants and language. Basing on the framework by Foulger (2004), the SLA theories (as mentioned in *Section 2.2: The Role of Discussions in Second Language Acquisition*) and the findings of this study, a model which describes the communication process among ESL learners in face-to-face and online settings is drawn in Figure 5.1.

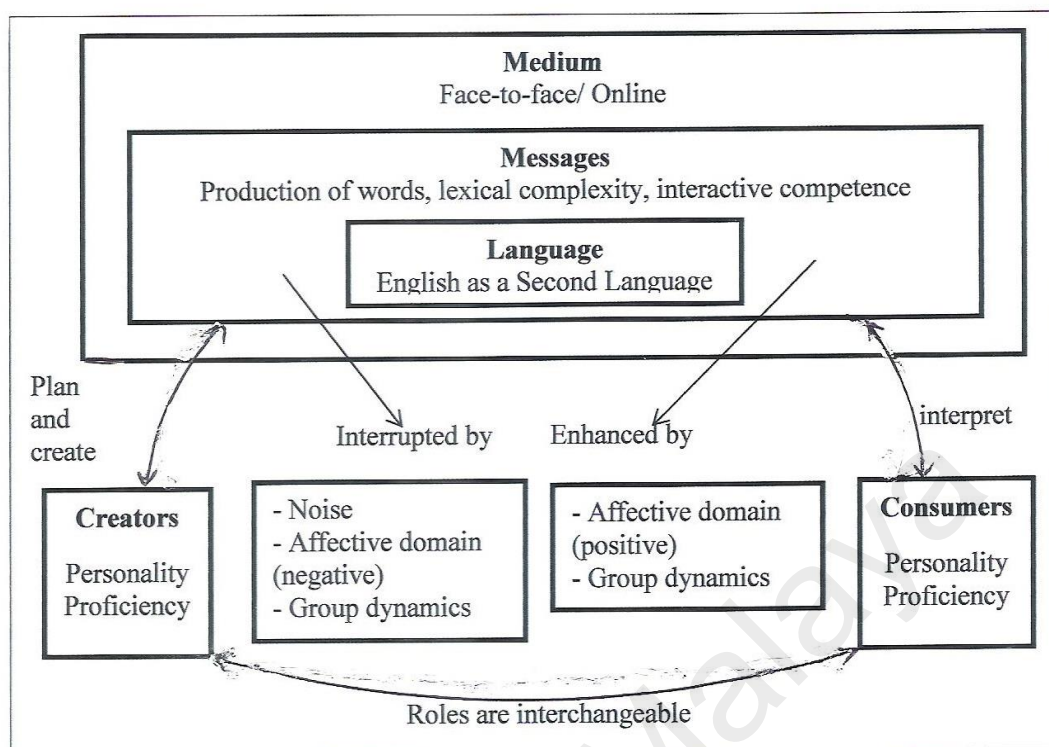


Figure 5.1: Group Discussion Model for ESL Learners

Figure 5.1 is an adaptation of Foulger's (2004) *Ecological Model of the Communication Process* (please refer to Figure 2.5). Different from Foulger's (2004) model which describes the communication process in general, this model focuses on group discussions among ESL learners and adds on aspects that can interrupt and enhance the communication process. The added aspects are noise, affective domain and group dynamics. The noise factor which can interrupt a discussion process includes the disturbing sounds, whispers or giggles that may affect effective listening. On the other hand, the affective domain can enhance the quality of the messages if the participants' attitude is positive and the reverse if the learners have negative perception. Likewise, group dynamics which involve the way participants behave and respond to each other can also affect the discussion process in a positive or negative manner.

Generally, the Group Discussion Model for ESL learners describes the importance of the medium and the participants (acting as creators or consumers) in affecting the messages composed using English as a second language. Based on the findings of this study, factors which can interrupt or enhance the effectiveness of the discussion process are also added in this model. Thus, this model would be helpful in enlightening the ESL language instructors and researchers about the aspects to look into when facilitating discussions for the learners to practise using the target language.

5.3.2 Implications for Research

This study has answered the call to fill in the gap in CALL which is still at an infant stage in Malaysia (Tam, 2009). The present study has also worked on the suggestions given by Fitze (2006) which is to investigate the effect of the learners' individual differences on their discourse and participation style in different discussion conditions. In addition, the reliable empirical research of this study has also contributed to the literature with significant findings that can raise awareness on the potential of online discussions to the ESL learners who have different personality types and levels of language proficiency (Chapelle, 2001). On top of that, qualitative analysis has also been carried out to provide a better understanding of the issue.

Despite that, there are other individual differences such as the role of auditory or visual learners that could be looked into. In addition, future research could look at the discourse and participation of ESL learners from advanced, high-intermediate, low-intermediate and low proficiency group; instead of just high-intermediate and low-intermediate as in this study. Gender variable and the effect of different types of noises can also be incorporated in future comparative studies. Apart from that, more

investigation on the size of the discussion groups, seating arrangement and rapport among the participants is also needed as it can affect the group dynamics and discussion process (Harmer, 1998). Future researchers could also work on the limitations which have been pointed out in *Section 1.7: Limitations of Study*. Apart from that, the improved version of the communication model derived from this study may also be useful for future researchers who are interested in expanding the current literature which compares face-to-face and online interactions in an ESL class.

5.3.3 Implications for Pedagogy

The findings from this study have helped to provide a more comprehensive view of the communication process. With the guidance of the more detailed model as shown in *Figure 5.1: Group Discussion Model for ESL Learners*, discussion activities can be carried out more effectively in an ESL class to aid students' learning.

This study has also shown the need to consider the medium of discussions and the learners' individual differences in terms of personality and language proficiency in an ESL class. ESL researchers and teachers are urged to utilise the different discussion settings appropriately to cater for the learners with individual differences. Language centres or language departments are also recommended to include personality tests in their students' placement tests as the learners' personality can affect the use of teaching and learning strategies (Arthur, 2010).

To stimulate learners' interest and involvement, the following suggestions for facilitating discussion activities in an ESL class can be referred to:

1. Carry out synchronous online discussions for a mixed classroom to promote balanced participation.
2. Create a topic which discusses the effectiveness of the discussion mediums and ask for suggestions to improve the face-to-face or synchronous online settings. This can allow learners to realise the importance of participating actively in either discussion settings and allow the ESL teachers to better understand the learners and cater to their needs.
3. Make online dictionary and 'Google translate' available in online discussions and encourage learners to use them.
4. Create online discussions for the less proficient learners.
5. Allocate sufficient time for learners to prepare before the face-to-face discussions.
6. Create small groups (four to five in a group) for face-to-face discussions; especially the introverts and the less proficient learners so that they can feel more confident.
7. Large group face-to-face discussions are more suitable for the extroverts with good language proficiency.
8. Eliminate potential noise. In face-to-face discussions, encourage learners to listen attentively, speak clearly and focus on discussions rather than scripting. In online discussions, the well-functioning of computers and network connection need to be ensured.

Since this study found that the less proficient and introverted learners usually do not perform as well as the extroverted and more proficient learners, more guidance might be needed to help these less proficient and introverted learners to feel more comfortable in speaking up during discussions. Online discussions can be introduced to

these learners before face-to-face discussions since they find it more comfortable for interactions. Apart from that, discussions with a focus on social purposes should also be created before the learners practise discussing topical issues and reflective topics. This can help the learners to develop personal relationship with the other members, nurture a sense of community and feel more confident. In face-to-face discussions, more preparation time and small groupings are also recommended for the introverted and less proficient learners. When these learners feel more confident with speaking the language in front of their friends, they will be more ready to join in large face-to-face group discussions.

On the other hand, a mix of both face-to-face and online discussions can be held for the extroverted and more proficient ESL learners. In a mixed-ability class, they can be given the role of a mentor whose main task is to listen and to provide feedback to the less proficient and introverted learners. However, training needs to be given so that their feedback is constructive rather than destructive.

Learners have always found writing difficult and 'painful' yet the participants of this study preferred online discussions which required them to write or type (Silvia, 2007). This finding shows that 'writing' in online discussions can help the ESL learners to practise writing with a positive attitude. In the study conducted by Colomb and Simutis (1996), they have also found the learners in online discussions possessed better writing ability. This can be attributed to the reduced anxiety of using the target language during the authentic and meaningful interactions in online discussions (Colomb & Simutis, 1996).

All in all, the use of online discussions in an ESL classroom should be promoted due to the benefits shown through the findings of this research. Moreover, encouraging ESL learners to participate actively in online discussions can enable the learners to take part in many different forms of online communities, interact with native language users and become self-directed lifelong learners of ESL (Blattner & Williams, 2009). However, face-to-face discussions are also vital and should not be neglected. More importantly, this research has shown that ESL language instructors should take note of the learners' personalities and language proficiency when choosing a suitable discussion setting and facilitating the discussions so that it can be fun, motivational and effective for second language learning.

5.4 Reflections

This study has investigated the participation style, lexical complexity and interactive competence of 48 participants who were divided into two groups. Each group consisted of introverts and extroverts with high-intermediate and low-intermediate language proficiency. They participated in two online discussions and two face-to-face discussions. During the discussions, they shared their opinions or ideas by answering the open questions in Appendix 7. Though the initiation of the experiment was perturbed by a few unexpected circumstances such as renovation of the computer laboratory, website censorship and disrupted Internet connection, the experiment was successfully carried out after the problems were fixed.

This research has answered the calls made by Fitze (2006) and Tam (2009) to include more participants in the study and to investigate other variables that may influence the findings such as the personality and language proficiency of the learners.

In addition, this study has also incorporated the suggestions which have been given by Wang and Woo (2007):

... future studies should involve a larger number of participants, have more heterogeneous discussion groups in terms of background or learning styles, and provide a more equal environment for both online and face-to-face discussions through the whole study period (p.285).

Finally, I would like to caution the ESL language researchers and practitioners to be careful in the incorporation of new technology in an ESL class. New technology should always be examined on different learners to maximise the potential of it. Simply implementing a new form of technology is not recommended. One should also bear in mind that there is no learner who is the same and thus “no single pedagogical solution which is applicable to all classrooms” (Ellis, 1990, p.68). Eclectic approach should be practised with consideration of the teacher’s level of computer skills and personality; learner’s language proficiency, personality, expectations and preferences. For online discussions, local constraints should also be looked at before implementing. A back up plan is always suggested in case of technological disruptions. It is also very important to note that the discussion environment and the new technology is just a tool with no wisdom. Therefore, the ESL language instructors need to use their wisdom to use the medium wisely (Ahmad, Corbett, Rogers & Sussex, 1985). As highlighted by Warschauer (1996), “the effectiveness of CALL cannot reside in the medium itself but only in how it is put to use” (p. 6).

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