

EFFECTS OF WEB-BASED COLLABORATIVE WRITING ON
LEARNERS' WRITING PERFORMANCE AND INTERACTIONS
IN A MULTILINGUAL ENGLISH CLASSROOM



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ผลของการเขียนแบบร่วมมือโดยใช้เว็บเป็นฐานที่มีต่อสมรรถนะการเขียนและ
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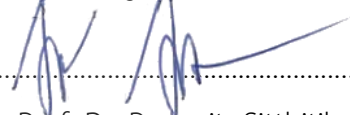


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Suranaree University of Technology has approved this thesis submitted in partial fulfillment of the requirements for a Degree of Doctor of Philosophy.

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นคร กิจจรูญชัย : ผลของการเขียนแบบร่วมมือโดยใช้เว็บเป็นฐานที่มีต่อสมรรถนะการเขียนและการปฏิสัมพันธ์ของผู้เรียนในห้องเรียนพหุภาษาที่ใช้ภาษาอังกฤษ (EFFECTS OF WEB-BASED COLLABORATIVE WRITING ON LEARNERS' WRITING PERFORMANCE AND INTERACTIONS IN A MULTILINGUAL ENGLISH CLASSROOM) อาจารย์ที่ปรึกษา : อาจารย์ ดร.สุขสรพร ศุภเศรษฐเสรี, 382 หน้า.

คำสำคัญ: การเขียนแบบร่วมมือ/ กูเกิล ด็อกซ์/ ผู้เรียนในห้องเรียนพหุภาษาที่ใช้ภาษาอังกฤษ/ การเขียนแบบร่วมมือโดยใช้เว็บเป็นฐาน/ สมรรถนะการเขียน

การแพร่หลายอย่างกว้างขวางของเครื่องมือการเขียนบนเว็บในชั้นเรียนพหุภาษาที่ใช้ภาษาอังกฤษ ได้สร้างความสนใจต่อการเขียนแบบร่วมมือโดยใช้เว็บเป็นฐาน งานวิจัยเกี่ยวกับผู้เรียนในห้องเรียนพหุภาษาที่ใช้ภาษาอังกฤษในการเขียนเรียงความเชิงวิชาการแบบร่วมมือแบบกลุ่มย่อยยังมีข้อจำกัด จึงจำเป็นต้องได้รับการศึกษาเพิ่มเติม งานวิจัยชิ้นนี้ใช้กลุ่มตัวอย่างจากนักศึกษามหาวิทยาลัยชั้นปีที่หนึ่งจำนวน 35 คนจากประเทศในภูมิภาคเอเชีย การศึกษาใช้แบบการวิจัยเชิงทดลองชั้นเบื้องต้นเพื่อศึกษาผลของการเขียนเรียงความเชิงวิชาการของผู้เรียนในห้องเรียนพหุภาษาที่ใช้ภาษาอังกฤษหลังจากได้เข้าร่วมในการเขียนแบบร่วมมือบนเว็บใน กูเกิล ด็อกซ์ (Google Docs) งานวิจัยดังกล่าวยังใช้กรณีศึกษา (embedded case study) เพื่อศึกษาการปฏิสัมพันธ์ของผู้เรียนในกลุ่มย่อยและพฤติกรรมการทำงานร่วมกัน รวมถึงการรับรู้จากประสบการณ์การเขียนแบบร่วมมือบนเว็บในชั้นเรียนการเขียนเรียงความภาษาอังกฤษ การศึกษาดังกล่าวรวบรวมข้อมูลจากแหล่งข้อมูลประกอบด้วยแบบสอบถามก่อนและหลังการศึกษา แบบทดสอบการเขียนเรียงความก่อนและหลังการทดลอง งานเขียนเรียงความแบบร่วมมือสองชิ้นงาน การเขียนสะท้อนการเรียนรู้ของผู้เรียน และการสัมภาษณ์แบบกึ่งโครงสร้าง การศึกษาเผยให้เห็นถึงผลการวิจัยที่สำคัญดังต่อไปนี้

(1) การทดสอบค่าเฉลี่ยของกลุ่มประชากรที่ข้อมูลสัมพันธ์กัน (paired-samples t-test) แสดงให้เห็นว่าประสิทธิภาพการเขียนเชิงวิชาการของผู้เรียนเพิ่มขึ้นอย่างมีนัยสำคัญหลังจากเข้าร่วมในงานเขียนเรียงความแบบร่วมมือสองชิ้นงาน สมรรถนะการเขียนของผู้เรียนมีผลสัมฤทธิ์เพิ่มขึ้นจากคะแนนเฉลี่ยจากแบบทดสอบการเขียนเรียงความหลังการทดลอง

(2) การศึกษาเผยให้เห็นรูปแบบการปฏิสัมพันธ์ 7 รูปแบบขณะที่ผู้เรียนทำงานเขียนแบบร่วมมือในกลุ่มย่อย ประกอบด้วย การทำงานแบบร่วมมือโดยสมาชิกกลุ่มให้ความช่วยเหลือซึ่งกันและกัน การทำงานโดยสมาชิกกลุ่มนำผลงานของแต่ละคนมารวบรวมไว้ด้วยกัน การทำงานโดยมีสมาชิกกลุ่มยึดตัวเป็นหลักและสมาชิกคนอื่นมีส่วนร่วมเล็กน้อย การทำงานโดยสมาชิกกลุ่มยึดความคิดของตนเป็นหลักโดยเพิกเฉยต่อความคิดเห็นผู้อื่น การทำงานโดยสมาชิกให้ความช่วยเหลือกันเชิง

ผู้เชี่ยวชาญสอนผู้ฝึกหัด การทำงานโดยมีสมาชิกให้ความร่วมมือในช่วงแรกแต่ถอนตัวภายหลัง และการทำงานโดยสมาชิกขาดความร่วมมือ

(3) ผู้เรียนในกลุ่มย่อยเลือกใช้ฟังก์ชันเปลี่ยนแปลงการเขียนและภาษาเชิงหน้าที่ประเภทต่างๆขณะที่มีการเขียนเรียงความแบบร่วมมือ การใช้ภาษาเชิงหน้าที่ดังกล่าวสื่อให้เห็นว่าผู้เรียนมีส่วนร่วมในกระบวนการเขียนแบบทบทวนเมื่อเขียนเรียงความแบบร่วมมือ

(4) ผู้เรียนแสดงทัศนคติเชิงบวกต่อการเขียนแบบร่วมมือบนเว็บใน กูเกิล ด็อกซ์ (Google Docs) การวิเคราะห์ข้อมูลเชิงคุณภาพเผยให้เห็นถึงเหตุผลหลายประการที่ผู้เรียนมีทัศนคติเชิงบวกต่อการเขียนแบบร่วมมือโดยใช้เว็บเป็นฐาน ประกอบด้วยกระบวนการทำงานที่เร็วขึ้น การระดมแนวคิดที่หลากหลาย การปรับปรุงคุณภาพงานเขียน การเสริมทักษะด้านการสื่อสาร และการเรียนรู้วัฒนธรรมที่แตกต่างกัน การศึกษาดังกล่าวสนับสนุนการเขียนแบบร่วมมือโดยใช้เว็บเป็นฐานตามกรอบแนวคิดของทฤษฎีวัฒนธรรมทางสังคมของไวโกตสกี (Vygotsky) การศึกษาดังกล่าวเน้นย้ำบทบาทสำคัญของภาษาในฐานะที่เป็นเครื่องมือในการปฏิสัมพันธ์เพื่อพัฒนาการเรียนรู้ของผู้เรียน การศึกษานี้ได้บ่งชี้แนวทางในการทำงานร่วมกันข้ามวัฒนธรรมและยังชี้ให้เห็นถึงการเรียนการสอนเพื่อพัฒนาด้านการเขียนบนเว็บในบริบทของชั้นเรียนพหุภาษาที่ใช้ภาษาอังกฤษ

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สาขาวิชาภาษาต่างประเทศ

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ลายมือชื่อนักศึกษา _____

ลายมือชื่ออาจารย์ที่ปรึกษา _____

NAKHON KITJAROONCHAI : EFFECTS OF WEB-BASED COLLABORATIVE WRITING ON LEARNERS' WRITING PERFORMANCE AND INTERACTIONS IN A MULTILINGUAL ENGLISH CLASSROOM. THESIS ADVISOR : SUKSAN SUPPASETSEEE, Ph.D., 382 PP.

Keyword: Collaborative Writing/ Google Docs/ Multilingual English Learners/ Web-Based Collaborative Writing/ Writing Performance

The widespread growing of web-based writing tools in multilingual English classroom settings has called attention to online collaborative writing. Research on multilingual English learners co-constructing academic essays in small groups is still much in its infancy that needs further investigations. The present study involved thirty-five first-year university students from Asian countries. The study employed a pre-experimental research design to examine the effects of multilingual English learners' academic writing performance after their prolonged engagement in two collaborative writing tasks via Google Docs. The study further used embedded case study by investigating learners in small group interactions and collaborative behaviours, and their perceptions of web-based collaborative writing experiences in an English composition class. Multiple sources of data were collected, including pre- and post-task questionnaire, pre- and post-test writing, two collaborative writing tasks, student reflections, and semi-structured interviews. The study revealed the following major findings:

(1) The paired sample t-test demonstrated that learners' academic writing performance showed a significantly increase after participating in two extended collaborative writing tasks. The learners' writing performance improved substantially as observed in the increase of mean scores in the post-test writing.

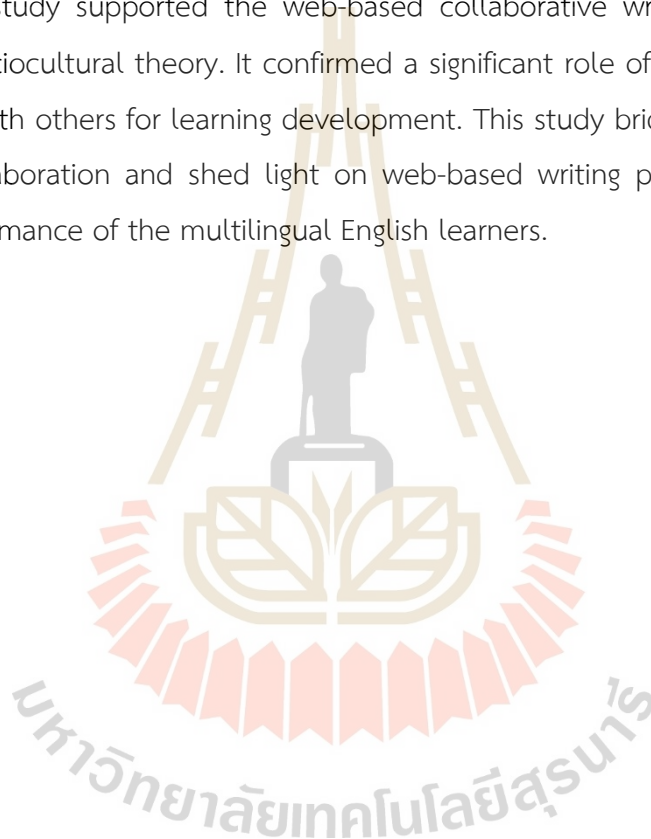
(2) The findings unveiled seven distinctive interaction patterns performed by small groups: collaborative, cooperating in parallel, dominant and passive, dominant and defensive, expert and novice, active and withdrawn, and failure interaction.

(3) Learners in small groups employed various types of writing change functions and language functions while co-constructing two collaborative writing essays. The


use of these language functions implied that learners were involved in the recursive writing process while performing collaborative essays.

(4) Learners showed positive perceptions toward the web-based collaborative writing in Google Docs. The qualitative analysis revealed various reasons learners held positive perceptions including accelerating the work process, generating more ideas, improving the quality of writing, enhancing communication skills, and learning about different cultures.

This study supported the web-based collaborative writing underpinned by Vygotsky' sociocultural theory. It confirmed a significant role of language as a means to interact with others for learning development. This study bridged the gap in cross-cultural collaboration and shed light on web-based writing pedagogy in improving writing performance of the multilingual English learners.



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Student's Signature 
Advisor's Signature Suksan S.

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Nakhon Kitjaroonchai



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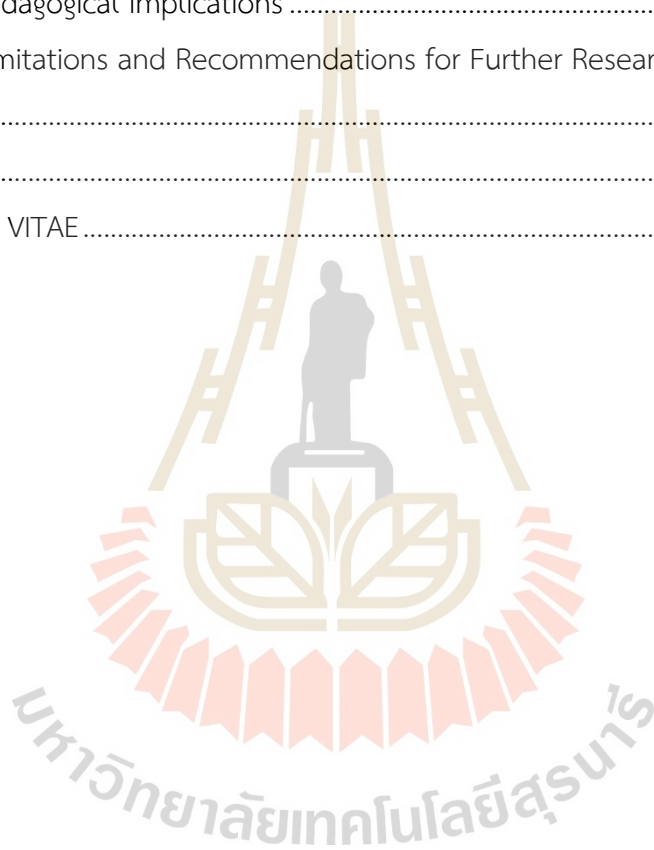
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LIST OF ABBREVIATIONS

AIU	Asia-Pacific International University
CMC	Computer-mediated Communication
CMCW	Computer-mediated Collaborative Writing
CW	Collaborative Writing
EAL	English as an Additional Language
EAP	English for Academic Purposes
EFL	English as a Foreign Language
ESL	English as a Second Language
GD	Google Docs
GE	General Education
ICT	Information and Communication Technologies
IELTS	International English Language Testing System
IOC	Index of Item-Objective Congruence
IRB	Institutional Review Boards
LFs	Language Functions
LREs	Language-related Episodes
NES	Native English Speakers
NNES	Non-Native English Speaker
OCW	Online Collaborative Writing
SLA	Second Language Acquisition
SMS	Short Message Service
TESOL	Teaching English to Speakers of Other Languages
WBCW	Web-based Collaborative Writing
WCFs	Writing Change Functions
ZPD	Zone of Proximal Development

CHAPTER 1

INTRODUCTION

In this chapter, an overview is provided of this study to investigate the effects of web-based collaborative essay writing in English on a multilingual English classroom context and explore the interaction patterns of learners when they jointly composed academic essays in Google Docs (GD) as a writing platform. The chapter, moreover, covers background of the study, statements of the problem, the rationale of the study, the purposes of the study, the research questions, the significance of the study, scope and limitations of the study. Lastly, it ends with the definitions of key terms.

1.1 Background of the Study

Of the four foundational skills of English language learning, writing is perceived to be the most significant skill, particularly in academic settings such as university level (Divsar & Heydari, 2017; Husin & Nurbayani, 2017; Karaca & Inan, 2020; Limbu & Markauskaite, 2015; Lin & Maarof, 2013; Vogelín, Jansen, Keller, Machts, & Moller, 2019). Writing has been recognized for a long time as a highly valuable and essential skill for a college student to succeed in an academic career. This is because most of the subjects offered in university study programs require students to produce term papers in partial fulfillment for each particular course defined in the degree program (Husin & Nurbayani, 2017; Jelodar & Farvardin, 2019). However, writing skill is considered the most difficult language skill to master among L2 learners (Divsar & Heydari, 2017; Karaca & Inan, 2020; Kioumarsí, Shalmani, & Meymeh, 2018; Watcharapunyawong & Usaha, 2013; Xu, 2018), since good writing skills require a large range of linguistic knowledge that includes grammatical accuracy, and lexical and syntactic competences. Furthermore, good writing skills require learners to have a wide range of strategies in planning to compose a text such as style, language register, rhetoric, and idea organization (Aydin & Yildiz, 2014; Jeloda & Farvardin,

2019; Karaca & Inan, 2020; Vogelin et al. , 2019). Some researchers (e.g., Al Fadda, 2012; Boggs, 2019; Forbes, 2019; McDonough & Vleeschauwer, 2019; Tardy, 2010) posited that for L2 writers to compose a fine-tuned academic paper, they need some mastery of their first language. For them to write in a second language, they must write from an expert position even they do not perceive themselves as experts in the topic they work on.

Although writing is perceived to be one of the most difficult language skills to acquire, mastering the skill has become desirable in our modern-day society where a great deal of communication is in English using written forms, such as electronic mail, short message service (SMS), twitter, instant messaging, blog, or other types of text-based technologies. Therefore, learning to improve and master English writing skills are essential for English as a second language (ESL) or English as a foreign language (EFL) learners involved in tertiary education (Chang & Lee, 2019) , as writing competencies affect students' academic achievement as well as preparing them for employment opportunities after college (Andrew, 2019; Williams & Beam, 2019).

This brings challenges to multilingual learners in English L2 writing class since a large number of learners with different L1 backgrounds entering international schools with academically and linguistically underprepared (Hirsch, 2014). Studies (e.g., Gunnarsson, 2019; Wang & Wen, 2002) found that learners employ their L1 to generate ideas for content and organization as well as directing their writing process during the initial stage of writing. English is used when examining the task and constructing texts to complete academic work to earn grades (Wang & Wen, 2002). This evidence is also reported in Gunnarsson's (2019) study that multilinguals reckon on their L1 in relation to the target language for particular purposes when dealing with perplexing L2 writing tasks. As writing involves complex cognitive processes, it is even more demanding for learners who speak and write in more than one language (Khan & Khan, 2016; Raoofi, Binandeh, & Rahmani, 2017). Learners of a lower English proficiency level tend to use linguistic knowledge of L1 extendedly when composing English texts (Kim & Yoon, 2014). They will incorporate both L1 and L2 writing knowledge into a combined unit of their language repertoire when they have accumulated sufficient knowledge of the target language (Kobayashi & Rinnert, 2012).

This incident occurs when multilingual learners constantly practice honing their writing skill by adopting their previously acquired writing knowledge on academic writing genres (Wilson & Soblo, 2020). Raoofi, Binandeh and Rahmani's (2017) study claimed that greater successful Malaysian ESL university students whose L1 backgrounds includes Chinese, Malay, and Tamil, could produce better texts in English when they use high level of writing strategies such as effort regulation, metacognitive, and cognitive when taking an English proficiency writing test. Therefore, handling with multilingual learners in writing classroom is a complex phenomenon and becomes a great challenge for the English language teachers worldwide (Marshall & Marr, 2018), particularly in countries where English is taught as a foreign language and learners are limited to the exposure of English in daily communication (Gunnarsson, 2019). However, one great benefit of teaching multilingual English language learners in an international school where English is used as a medium of instruction is that learners cannot communicate with each other using their L1, but the common language, which is English. This could propel them to master the target language faster if they are highly motivated.

Rasheed, Zeeshan, and Zaidi's (2017) study revealed that learners in the multilingual classrooms in the city of Balochitan, Pakistan with less exposure to English lack confidence to utilize English to complete tasks for they are reluctant to make mistakes. Learners' deficiency in linguistic background, anxiety, and lack of proper training to improve English skills are factors contributing to English language learners' failure to master the language. This draws attention to the role of writing instructors to build trust with learners and value their unique interests and cultural backgrounds they have brought in the writing classroom. In academic writing settings, a multilingual classroom teacher needs to provide student-teacher conferences and give constructive feedback, and dialogue with learners and scaffold them to reach a higher level (Wilson & Soblo, 2020). Learners undertaking English as their L2 in a multilingual classroom setting should be encouraged to make use of their L1 if it benefits their learning process (Galante, 2020). Tullock and Marta (2013) stated that multilingual writers employ their linguistic repertoire as a significant resource to compose texts in the target language. Therefore, instructors should not solely emphasize their own

cultural values or favor native English norms because such attitude restricts learners to utilize their own strategies and learning goals (Oxford & Schramm, 2007). Learners with diverse L1 backgrounds enroll in the writing course bringing with them some astounding writing experiences. Their former experiences of using the language in different social contexts must not be neglected, but they should be encouraged to make use of linguistic repertoires to harness their language development (Rowe, 2019).

In the context of Thailand, there are growing international degree programs enticing students from its neighboring countries to enroll in the Thai universities (Michael, 2018). Learners undertaking courses in an international degree program are anticipated to exhibiting good writing commands. However, Thai university students are found struggling with academic writing skills such as failing to construct an academic essay within a restricted time, using ungrammatical English in academic writing, and poorly developing content and essay structure (Iamla-Ong, 2013). Similar findings are reported in Boonyarattanasoontorn (2017) and Waluyo (2019) whose studies found that Thai university students perceive writing in English is a severe problematic issue. They perceive academic writing in English is the most difficult language skill to master when they enroll in college composition (Rattanadilok Na Phuket & Othman, 2015; Sermsook, Liamnimitr, & Pochakorn, 2017). The major sources of mistakes frequently committed by Thai EFL learners while composing academic essays come from various factors which include interlingual and intralingual interference (Rattanadilok Na Phuket & Othman, 2015), the lack of English grammar and vocabulary (Khumphee & Yodkamlue, 2017; Sermsook, Liamnimitr, & Pochakorn, 2017). Teachers of English need to organize intensive academic writing courses and train Thai learners to practice constructing academic genres by introducing good writing models from experienced or competent writers of how these successful writers employ language devices (Chanyoo, 2018).

Thai EFL learners do not receive adequate training to hone their academic writing skills (Noom-ura, 2013). Their poor performance in constructing texts stems from varied reasons that include inadequate practice, limited knowledge of grammatical units and vocabulary, insufficient feedback from teachers (Seensangworn & Chaya, 2017) and

teacher-dominated classroom practice (Stone, 2017). Researchers (e.g., McDonough, Vleeschauwer, & Crawford, 2018) found that using collaborative writing (CW) tasks could enhance Thai university students' English writing skills. Likewise, Linh and Suppasetsee's (2016) study revealed that collaborative learning using Facebook groups could benefit Thai EFL students' writing skills. A recent survey study of implementing CW in Thai EFL writing course revealed that Thai undergraduate students and teachers perceived CW tasks could positively influence writing development (Coffin, 2020). The use of CW activities needs further investigation in Thai university classroom contexts to explore additional factors that may contribute to the long-term benefits of teamwork during the writing process and examine if CW leads to personal writing development (Coffin, 2020; McDonough et al., 2018).

Although CW activities have been proven to enhance the quality of writing when L2 learners perform difficult tasks in composing English text (Liu, Liu, & Liu, 2018), increase L2 learners' writing accuracy and vocabulary acquisition (Bailey & Judd, 2018; Dobao, 2014), provide opportunities for learners to brainstorm or create meaning (Ene & Upton, 2018), there is scant evidence in Thailand advocating the implementation of CW activities in the college writing classroom (Coffin, 2020 ; McDonough et al., 2018) where learners come from culturally and linguistically diverse backgrounds. A few studies (e.g., Suwantarathip & Wichadee, 2014; McDonough & De Vleeschauwer, 2019; McDough et al., 2018) investigated the effects of CW activities on Thai EFL learners writing ability. The participants in these previous studies were all native Thai speakers. The researchers focused on the effects of CW activities on learners' writing ability (Suwantarathip & Wichadee, 2014), quality of texts jointly constructed (McDonough et al., 2018), and effect of collaborative prewriting strategy on individual writing development (McDonough & De Vleeschauwer, 2019). Further research needs to be done exploring how Thai EFL learners enrolling in an international university jointly construct texts in Google Docs (GD) with their foreign classmates who hold different linguistic backgrounds. This will greatly contribute to the existing body of literature on sociocultural theory regarding the effects of CW tasks, and how multilingual English learners in small groups employ language functions (LFs) or writing change

functions (WCFs) to interact with each other when they jointly compose academic essays. Research in multilingual English learners constructing academic essays in small groups needs further investigations to enrich our understanding of sociocultural worldview. The following subsection discusses statement of the problem, and why this realm of research is worth investigating.

1.2 Statement of the Problem

In many EFL contexts where English is rarely spoken in daily communication, learners perceive writing as a mere medium of reinforcement and acquiring a set of language forms and structures (Forbes, 2019). Learners find writing skills a hurdle (Boonyarattanasoontorn, 2017; Waluyo, 2019) and they fail to provide solid evidence or structure of argumentation when they write up their arguments for essays and thesis statements (Ka-kan-dee & Kaur, 2014; Pramoolsook & Qian, 2013). This is because they lacked proper trainings in writing when they were in high school (Jelodar & Farvardin, 2019). Learners are often taught to write independently in the traditional style for writing is viewed as an individual learning activity where individuals need to construct their own knowledge (Limbu & Markauskaite, 2015) to construct their identity (Li & Deng, 2019). This autonomous learning process proves to be successful in acquiring knowledge of a foreign language only when learners are highly motivated and take their learning initiative and responsibilities earnestly (Forbes, 2019; Singer, Togo, Mochizuki, & Tanaka, 2010; Yagcioglu, 2015). However, we should acknowledge that learners, particularly in a multilingual English language classroom, display a wide range of learning styles, and those whose language proficiency level is marginalized need close guidance and mentoring from a more capable peer or teacher (Carhill-Poza, 2017).

Exley's (2005) study on "Learner characteristics of Asian EFL students" revealed that Asian EFL students, such as Indonesians are described as passive, shy, and quiet learners. Likewise, Chinese EFL learners and Thai EFL learners perceive their teachers as transmitters of knowledge who can control classroom-learning activities, incubate and impart knowledge to their students (Han, 2019; Peng, 2014; Tapinta, 2016). Vietnamese college

students are more independent than collective at group work but perceive teachers are their knowledge providers (Hanh & Nooy, 2020), whereas Lao students are obedient to their teachers and their low English language proficiency caused by ill-trained teachers (Souriyavongsa et al., 2013). Teachers are familiar with traditional teaching methods where learners are taught not to challenge their teachers' authority in the classroom (Peng, 2014; Zhang & Zhan, 2020). Therefore, teachers play a dominant role in the classroom, particularly in Asian countries, and their lesson preparations influence learners' motivation and writing performance.

In a multilingual English language classroom, a number of writing teachers do not receive proper training to deal with linguistically diverse learners (Marshall & Marr, 2018) and put stress on the traditional product-oriented approach emphasizing summative assessment and training learners to pass the tests and exams (Puengpipattrakul, 2014). A large class size consisting of many students affects classroom management and instructional time as well as productivity and effective interaction (Coffin, 2020; Hidayati, 2018). Writing materials and teaching methods orchestrated by underprepared writing instructors are crucial factors to demotivate L2 writers to develop writing skills (Karaca & Inan, 2020; Souriyavongsa et al., 2013). Although writing revolution has transformed the traditional writing style on paper-based to a computer-based system today (Li & Storch, 2017), a large number of writing teachers in EFL contexts have not integrated these modern technologies to assist L2 learners in writing classroom. Some teachers perceived that using word processors requires more cognitive effort than using a traditional method with paper and pen (Williams & Beam, 2019). Other researchers (e.g., Mills & Exley, 2014; Vrasidas, 2015) found that teachers do not want to use digital writing practices because web-based writing is time consuming. Thus, poorly prepare learners who are not exposed to English in daily communication to compose academic essays seems downhearted and it will negatively affect their language performance. As mentioned earlier, writing in English is an essential skill to master in a tertiary education (Divsar & Heydari, 2017; Husin & Nurbayani, 2017; Vogelín et al., 2019). Therefore, the English composition course is designated as compulsory in almost all universities worldwide.

To explain this phenomenon, the researcher wanted to illustrate the nature of writing courses taught at Asia-Pacific International University (AIU). Throughout the degree program, the English major students must take at least six writing courses. The required writing courses set in the study program are English composition I and II, Expository Writing, Feature Writing, Creative Writing, Introductory Research Methods and Writing. The students in most of these writing classes are instructed to carry out their writing tasks independently in traditional modes with minimal teacher feedback on writing draft, and peer review and editing process are rarely introduced. One of the most fascinating writing courses is English composition I (ENGL111) since it is a fresh writing course in college level for all first-year university students who come from various linguistic backgrounds (mainly from Asian countries) are required to enroll in the subject before moving to a higher level or starting their major courses. English composition I is designated a general education (GE) course which requires all first-year university students from different academic disciplines to undertake in partial fulfillment of the requirements for their study programs. Each new academic year ENGL 111 course offered under the Faculty of Arts and Humanities is divided into three sections depending on the number of enrolled students in each year. Each class section is limited to twenty-five to thirty students to maximize learning opportunities and maintain a positive classroom environment. Each section of this writing course consists of multilingual English learners who are predominantly from Asian countries such as Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam. These EFL learners come with diverse linguistic and cultural backgrounds of learning English. Some perceive English as their third language since they speak ethnic dialects or their heritage languages. For example, a student holding a Thai identification card speaks ethnic dialects like Hmong or Karen language as the mother tongue aside from the Thai national language, or students holding Malaysian citizenship but speak ethnic dialect such as Kadazan-Dusun or Iban dialect as their mother tongue besides Bahasa Malaysia. The number of years of learning English and the language proficiency levels vary widely from individual to individual for these multilingual English learners enrolling at AIU. Therefore, a writing classroom with learners coming from such

diverse cultural backgrounds and displaying varied language proficiency levels could produce an astounding phenomenon from a sociocultural perspective when they are assigned to work in small groups to co-construct texts and share co-authorship (Li & Zhu, 2017; Marshall & Marr, 2018).

As a researcher who is deeply interested in CW in EFL classroom contexts, I interviewed two English language teachers who have taught English composition to first-year university students at AIU for nearly a decade and interviewed twelve students who used to enroll in the composition course. I discovered that the English composition writing assignments were carried out on an individual basis with minimal feedback from the instructor during the writing process due to time constraints and the preconceived notion that writing is personal development. These students perceived that writing is a language skill that individuals must develop on their own as it involves private stories that are perplexing to share with the unacquainted. With this perceived notion expressed by the selected students, the course instructors failed to employ a collaborative strategy in their composition classroom for fear of contradictory viewpoints when learners from diverse cultural backgrounds work together. Consequently, learners with poor command of English had to navigate their own learning paths as they struggled to develop academic writing skills. This occurrence created a great disparity between the high and low achievers because CW practices through more capable peer-supported learning (Carhill-Poza, 2017) was absent. In fact, common errors at word level (e.g., articles, plural nouns, prepositions, verbs, pronouns, word choices, spelling mistakes et al.), as well as at the sentential level (e.g., run-on sentences, comma splices, and subject omission), can be rectified through peer review (Sermsook et al., 2017). CW practice can reduce teachers' workload of correcting grammatical mistakes or other types of writing errors committed by learners with low language proficiency (Bailey & Judd, 2018; Carhill-Poza, 2017; Dobao, 2014).

It is worth exploring multilingual English learners' use of the language in academic settings through the lens of sociocultural worldview that includes the effects of CW tasks on individual performance (McDonough & De Vleeschauwer, 2019), LFs and WCFs, and collaborative interaction patterns (Li, 2014; Li & Kim, 2016; Li & Zhu, 2017) when learners

interact with one another. These elements will contribute to the existing body of literature concerning the English language classroom where learners are linguistically diverse. Although previous studies on WBCW tools, such as Wikis or GD, have been studied increasingly over the past decade in ESL/EFL classroom settings in countries such as America (Li & Kim, 2016; Woodrich & Fan, 2017); Argentina (Berdun et al., 2018); Canada (Bhowmilk, Hilman, & Roy, 2018; Cho, 2017) ; China (Zhang, 2019; Zhao, 2018); Germany (Steinberger, 2017; Strobl, 2014); Iran (Hanjani & Li, 2014; Kioumars et al., 2018); and Kuwait (Algahsab, Hardman, & Handley, 2019), there have not been any studies examining the effects of using GD for CW tasks in English composition course and exploring small group interactions in a multilingual English language classroom in an international university in Thailand. Large gaps remain underexplored investigating CW styles and interaction patterns via WBCW in small group using GD. Therefore, bridging the gap is the main aim of this present study. The researcher discusses why it is worth studying CW in a classroom with multilingual English learners. Reasons for conducting the present study are elaborated and discussed in the rationale of the study, which comes in the following section.

1.3 Rationale of the Study

Technology integration in the writing classroom dates back over 20 years when earlier researchers (e.g., Ogata, Yano, & Wakita, 1998) shifted from word processing to the networked writing classroom, which permits students and teachers to exchange marked-up documents via the Internet. This approach allowed the teachers to analyze and reuse the marked-up document for their class instruction when electronic portfolios of writing were submitted (Kahtani, 1999). The Internet brought several advantages compared to traditional paper-based portfolios. Student and teacher interaction via email provides students opportunities to employ varied rhetorical devices and strategies to interact with their teacher outside of the traditional classroom setting (Bloch, 2002). Collaborative environment for situated language learning supports students' interactive learning experiences (Shih & Yang, 2008). With more advanced technologies, WBCW tasks were created and investigated, but the collaboration often takes place within online chats,

email communication, or discussion boards (Kessler, Bikowski, & Boggs, 2012). Researchers (e.g., Strobl, 2014) integrated GD as a tool for CW to investigate the impact of online collaboration on the writing process and final text. Strobl's (2004) study reported that collaboratively created texts received higher scores and showed more appropriate selection and organization of ideas, although no significant difference was found between individual and CW in terms of accuracy, fluency, or complexity. More recently, when Abrams (2019) investigated CW and text quality in GD, her study revealed that students who worked more collaboratively in their groups could produce texts with more relevant content and better coherence than those produced in less-collaborative groups. This is because collaboration allows learners to jointly construct texts and draw linguistic resources to assist their writing development.

Other researchers (e.g., Cho, 2017; Li & Kim, 2016) focused on learners' interaction patterns in the CW process. Li and Kim (2016) examined two ESL groups' interactions during two CW assignments (research proposal and annotated bibliography) by using a wiki-based writing platform. The researchers discovered that the two groups working on identical tasks, using the same tool, performed remarkably different patterns of interaction throughout the asynchronous CW process and the interaction patterns changed across the two different tasks.

Another research study was conducted by Cho (2017) in a Canadian school investigating the use of GD as synchronous WBCW tool. The group's interaction patterns were recorded when the team members engaged in writing tasks. The study revealed that group interaction patterns varied across different tasks. These aforementioned studies, however, were carried out in English native-speaking universities in which the participants' English proficiency level was upper-intermediate to advanced level as they were exposed to English daily. What remains unexplored is to employ a similar approach but with multilingual English learners who have limited exposure to English in daily communication. This will allow further insights to be gained about the effects of CW tasks and the interaction patterns of learners with diverse L1 backgrounds and varying levels of English language proficiency in a university context in Thailand. As recommended by Li and Kim

(2016), the framework and dynamic nature of peer interaction can be explored further with additional ESL/EFL learners by using collaboration tools such as GD. With this notion in mind, WBCW could be explored further with the use of formal assessment on peer interactions as recommended by Cho (2017) and Steinberger (2017). The other unexplored area in previous research is the use of pre- and post-test to determine the quality of individual writing products after engaging in CW tasks. By considering this, the present study will shed light on how WBCW activities and peer interactions can influence individual writing performance. As earlier studies affirmed, CW tasks propel learners to pool their linguistic resources and consult one another when they handle a difficult task (Begum, 2016; Jelodar & Farvardin, 2019; McDonough et al., 2018). Their hands-on experience, via collaborative work, had positive effects on their individual performance. However, these claims emerged from CW activities studied with EFL learners who share the same native tongue, such as native Persian speakers (Jelodar & Farvardin, 2019), native Thai speakers (McDonough et al., 2018), or native Chinese speakers (Wang, 2019). Further investigation is needed if positive effects of CW, interaction patterns, use of writing change functions (WCFs) and language functions (LFs), or CW styles can be translated into CW tasks jointly constructed by linguistically diverse learners.

Li's (2014) study reported that five distinctive patterns of interaction emerged from the four small groups who co-constructed two wiki-based tasks: collective, active/withdrawn, expert/novice, dominant/defensive, and collaborative. According to Li, a collective pattern of interaction is defined as members jointly contribute text and make equal degree of control over tasks, and members are willing to engage with each other's text; an active/withdrawn pattern is explained by one or two members actively engaged in the task, but the third member shows a reduced degree of contribution and eventually withdrew from the group; an expert/novice pattern is depicted when one member shares the role of "expert" taking control over the task and supports other members to participate actively; a dominant/defensive pattern refers to members' unwillingness to engage with each other's contributions, but rather defend their stance or disagree with given suggestions; and collaborative pattern is defined as three members actively

participate in the task and take a more collaborative stance to group work. However, the majority of research participants in Li's study were Chinese with three other graduate students from Iraq, Russia, and Saudi Arabia. The researcher recommended further exploring learners with different language or cultural backgrounds, or gender working together in a CW project.

Previous studies (e.g., Li & Kim, 2016; Mak & Coniam, 2008; Wang, 2019) investigated the WCFs and LFs produced by learners in small groups while engaging in group writing projects. According to Mak and Coniam (2008), WCFs occurred while learners were engaged in a CW task, including adding ideas, expanding ideas from what was being introduced by a teammate, reorganizing ideas or moving text around, and correcting errors. Whereas Li & Kim's (2016) study found two additional WCFs aside from Mak and Coniam's earlier work. The two added WCFs are deleting and rephrasing (conveying existing ideas in a different way but keeping original meaning). These latter researchers further looked at how small groups employed LFs while performing a group task. The LFs produced by small groups in task negotiations include acknowledging, agreeing, disagreeing, elaborating, eliciting, greeting, justifying, questioning, requesting, stating, and suggesting. These LFs are divided into two main categories: initiating and responding. However, these previous studies involved mainly native speakers of Chinese working together in small groups. It is worth investigating small groups whose members possess various language backgrounds and new to each other to jointly construct academic essays together.

Earlier research (e.g., Cho, 2017; Li & Zhu, 2017) obtained qualitative data from textual analysis detected from revision history, discussion page, or chat window in wiki, or through interviews or observations to learn about collaborative behaviour throughout the writing process. Evidence collected from previous studies shows that scant data were collected on the contributions of each member in a group toward the CW assignment in terms of participation equity, mutuality, and quantity of texts. More studies need to be conducted to investigate CW styles in GD throughout the writing process. This investigation can be envisaged through DocuViz, the application developed by the research team from the University of California, Irvine. This application can create automatically a visual history

chart across different timelines, illustrating the amount of work each team member contributes. DocuViz can detect data entered in a GD file and it generates preliminary statistics related to collaborative revision behaviour of the contributors (Yim et al., 2017; Wang et al., 2015; Warschauer et al., 2019). Although this data visualization tool is available presently, until now only a few studies have used this it to observe CW styles (Yim et al., 2017). More research is needed to expand knowledge of how multilingual English language learners interact with one another. The researcher has not yet found any empirical study reported on a WBCW task using GD with the integration of DocuViz conducted involving EFL learners from Asian countries working collectively in small groups. Setting up small groups whose members are culturally diverse to perform CW tasks on a WBCW tool such as GD is a unique practice in writing classroom instruction. Such CW activities will require “a broad range of cognitive, socio-cultural/linguistic factors” (Marshall & Marr, 2018) in a multilingual English language classroom. Motivated by the knowledge gap and with a personal interest in WBCW, the researcher employed GD and DocuViz to examine the effects of CW tasks and further explore learners’ CW patterns, and their employment of WCFs and LFs throughout the CW process.

Reasons for choosing GD are it holds significant features such as word processor, spreadsheets, presentation, or web forms that are beneficial for online CW in small groups when members are not all present on campus due to the COVID-19 pandemic situation. GD has a built-in chat room that facilitates real-time interaction and it permits multiple collaborators to work and edit texts simultaneously at their own pace (Zhou, Simpson, & Domizi, 2012) either in a synchronous or asynchronous mode. Changes or feedback given by individual collaborators is saved automatically. Furthermore, GD holds a revision history that collaborators can refer back to all track changes, and it can operate on Android and iOS mobile systems. Aside from GD, the researcher employed DocuViz that runs on Google Chrome. DocuViz can automatically generate a visual history bar chart across different timelines and display the entire revision history in a GD file. This will enable the researcher to explore group interaction patterns and contributions from different members. Integrating DocuViz and add into a GD file could provide a better understanding of

learners' CW styles in networked environments as well as help raise their awareness on both collaboration (e.g., the proportion of contribution) and aspects of collaboration patterns associated with achieving a higher quality of writing.

This will shed light on teaching CW in a multilingual English language classroom setting and understanding learners' needs of employing strategies or language repertoires to wade through academic writing in a college composition course. Such teaching practice will inform writing teachers to embrace diversity of languages, cultures, and ideas learners bring into classrooms and perceive them as "potential resources rather than a barrier to language development" (Lin, 2013, p. 522), as L2 learners rely on L1 to support their negotiation in making sense of a target language (Forbes, 2019). Furthermore, using a web-based tool to promote CW tasks would aid the instructors to design appropriate WBCW tasks and provide instructional guidelines to enhance academic writing skills to support learners in their academic writing practice in college composition.

1.4 Purposes of the Study

The global aims of this study were to examine the effects of CW tasks on writing performance of multilingual English learners at Asia-Pacific International University (AIU), Thailand, and explore learners' CW and interaction patterns and the LFs employed by the group members. The study further investigated learners' perceptions of WBCW experiences. To achieve the aims of the study, four major objectives were formulated:

1. To examine the effects of collaborative writing tasks on individual learners' writing performance in an argumentative essay.
2. To explore the learners' collaborative writing patterns in the English composition course via Google Docs.
3. To investigate the writing change functions and language functions used in collaborative writing when learners are engaged in writing tasks.
4. To explore the learners' perceptions of their web-based collaborative writing experiences in Google Docs.

1.5 Research Questions

To achieve the aforementioned research purposes, the following research questions were postulated:

1. Do collaborative writing tasks help to improve individual learners' writing performance in an argumentative essay? If so, how?
2. What patterns of interaction occur when learners engage in collaborative writing tasks via Google Docs?
3. What are the writing change functions and language functions used in collaborative writing when learners are engaged in writing tasks?
4. What are the learners' perceptions of the web-based collaborative writing experience in Google Docs?

1.6 Significance of the Study

This present study holds potential significance in both theoretical and pedagogical implications and it further provides new insight into exploration of WBCW from a sociocultural perspective.

Firstly, it is anticipated that this research study will contribute to the theoretical dimension of sociocultural theory, which claims that knowledge is socially and culturally constructed by learners who are positively and actively interact with one another in the collaborative work they are engaged (Amineh & Asl, 2015; Colliver & Veraksa, 2019; McKinkey, 2015; Zhang & Lin, 2018). This study could help bridge the gap in the current body of literature regarding the effects of CW tasks (McDonough & De Vleeschauwer, 2019) and WBCW interaction patterns (Cho, 2017; Li & Kim, 2016; Li & Zhu, 2017; Wang, 2019) in a multilingual English language writing classroom context where linguistically diverse learners jointly construct texts in small groups. To date, scant research has explored how linguistically diverse learners in EFL classroom contexts jointly construct texts in small groups and their use of LFs to interact with one another to accomplish tasks. This could enrich the existing body of literature and understanding of a holistic view of language

learning informed by sociocultural theory with regard to the conception of sociocultural theory, such as the notion of Vygotsky's Zone of Proximal Development (ZPD), or the notion of scaffolding. This would open doors and offer insights into the exploration of technology-mediated writing instruction in a multilingual English language classroom context and provide teachers to interpret learners' interactions and CW pattern while engaging in WBCW tasks.

Secondly, this research study would contribute to the pedagogical implications of WBCW tools such as GD to enhance learners' writing performance. Writing teachers can consider utilizing the findings of the present study concerning the effects of CW tasks in supporting L2 learners in a multilingual English language classroom to hone writing skills through collaboration and peer feedback. Additionally, instructors may consider integrating educational technologies into CW tasks since collaboration is evidenced to enhance writing skills and language development (Bailey & Judd, 2018; Dobao, 2014; Jelodar & Farvardin, 2019; McDonough et al., 2018). With the rapid advancement and accessibility of information and communication technologies (ICTs) (Williams & Beam, 2019), teachers are propelled to incorporate educational technologies to equip learners with 21st century skills (Ene & Upton, 2018), in which collaboration and analyzing via network is one of the crucial skills. Integrating educational technology (e.g., GD and DocuViz) to support writing development and monitor members' contributions can vitalize the classroom atmosphere and avoid classroom constraint disadvantages, large class size, peer dominance, free-rider problem, teacher-oriented activities, and competitiveness.

Lastly, the learners' perceptions of WBCW experience in GD were explored to elicit their reactions and perceived levels of satisfaction after engaging in CW tasks. The findings drawn from both quantitative and qualitative data can be implemented to develop a more effective writing course with the integration of technology to enhance writing performance and promote teamwork skills in a multilingual English language classroom. As we live in a highly competitive society, learners may become self-absorbed and thoughtless of others by trying to outdo their peers in academic grades. Thus, it is a responsibility of classroom teacher to foster the development of interpersonal and

teamwork skills as well as to raise learners' awareness of the benefits of group work in acquiring a foreign language in an international university. As an axiom echoes, "together we can achieve more".

1.7 Definitions of Key Terms

The definitions of key terms, which are frequently mentioned throughout the study, are operationally defined as follows:

1. Collaborative Writing (CW): In this study, CW refers to "the joint production of a written text" (Storch, 2011, p. 275) or co-authoring of a written text by three or four learners in relation to WBCW tasks in GD as assigned by the researcher.

2. Collaborative Writing Style: In this study, CW Style refers to styles of writing displayed in the form of "seismic visualization" bar chart generated by DocuViz, the data visualization developed by the research team from the University of California Irvine.

3. DocuViz: DocuViz is an interactive data visualization tool that displays revision history. The system was developed by Wang and his research team from the University of California, Irvine. DocuViz can display records of a member's contribution and time of contribution. Colors represent members engaging in the collaboration and the size of each block features the amount of contribution in characters.

4. English Composition: In this study, English composition refers to the writing course for first-year university students offered by the Faculty of Arts and Humanities at AIU, Thailand. The intent behind the course is to equip students to write academic essays logically using the four principles of unity, support, coherence, and sentence skills.

5. Google Docs (GD): Google Docs refer to "a cloud computing-based set of office tools, which implements a web-based collaborative rich environment that provides the most used features of the desktop-based office suite" (Forment et al., 2012, p.1484). In this study, it is used as a WBCW tool that permits users to freely create and edit the content of the group tasks.

6. Interaction Patterns: Interaction Patterns refer to different possibilities where individual members display their active engagement in text construction in the CW process

to achieve the group aims. The interaction patterns can be observed through individual members' balanced participation in text co-construction (Li & Kim, 2016) recorded in GD version history and displayed through DocuViz. Furthermore, interaction patterns are observed from members' level of text contribution (equality) and interaction with peer's contribution (mutuality).

7. Language Functions (LFs): Language Functions refer to “the mediating functions of the language used in communication discourse during the process of task negotiation” (Li & Kim, 2016, p. 30) in the CW tasks. In this study, the LFs used in task negotiation are such things as acknowledging, agreeing, disagreeing, elaborating, justifying, requesting, stating, suggesting, and questioning. There are divided into two main categories: initiating and responding (Li, 2014).

8. L2 Writing: In this study, L2 Writing refers to the act of writing academic essays (e.g., descriptive and argumentative essays) in English performed by non-native English writers.

9. Multilingual Learners: In this study, multilingual learners refer to first-year university students who come from a variety of linguistic and cultural backgrounds (e.g., international students from Asian countries such as Cambodia, China, India, Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam) undertaking English composition at AIU.

10. Perceptions: In this study, perceptions refer to EFL learners participating in the study's positive, neutral, or negative attitudes toward the WBCW tasks via GD. Their perceptions include complaints, comments, or other opinions expressed in the survey questionnaire, reflective journal, or semi-structured interviews.

11. Sociocultural Theory: Sociocultural theory draws heavily on the work of Vygotsky (1987) who claimed that individuals' cognitive development occurs when they are engaged in social interaction, or individuals' knowledge is derived from their interactions with the surrounding environment and other people around (Roth, 2000) by using language as a powerful tool to absorb knowledge and accomplish tasks (Lantofl & Thorne, 2007).

12. Writing Change Functions (WCFs): Writing Change Functions refer to the ways in which learners co-construct texts in Google Docs. Mak and Coniam (2008) identified writing change functions as adding ideas, correcting errors, expanding ideas, and reorganizing ideas. In this study, writing change functions involve adding, correcting ideas, deleting, reorganizing, and rephrasing texts.

In conclusion, this introductory chapter illustrated an overview of the background of this research project aiming at investigating the effects of CW tasks on individual learners' writing performance, exploring learners' CW styles and interaction patterns, and examining the learners' perceptions of their WBCW experiences in order to contribute to the body of emerging literature in teaching writing to multilingual English learners in a composition course. The chapter started with the background of the research, followed by the statement of the problem, the rationale of the study, the purposes of the study, the research questions, and the significance of the study. The chapter ended with the definitions of key terms related to the study. A comprehensive review of related literature and a summary of related studies that support this present research is presented in the next chapter.



CHAPTER 2

LITERATURE REVIEW

This chapter mainly presents a thorough review of the key concepts that provide theoretical groundwork for the empirical part of the present study. The content in this chapter consists of five main topics, namely, writing, learning theories, collaborative writing strategies, computer-mediated collaborative writing (CMCW), and previous studies of collaborative writing (CW) with Google Docs (GD) and Wikis. The chapter begins with some perspectives on writing, followed by an overview of the nature of L2 writing, multilingual learners in L2 writing context, and L2 writing and Thai EFL learners. Three accustomed approaches to teaching L2 writing are analyzed and critiqued for their strengths and weaknesses in order to determine the most appropriate one to be integrated into the present study. Subsequently, learning theories such as social constructivism and sociocultural theory, CW strategies, and CMCW are also reviewed. Lastly, reviews of previous studies of CW with GD and Wikis are summarized, and research gaps are identified in order to reach the theoretical framework for the present study.

2.1 Writing

Writing in second language context is currently the subject of a considerable amount of research papers and educational journals since producing quality writing is paramount and propitious to academic success. Thus, this section provides some perspectives of writing, an overview of the nature of L2 writing, multilingual learners in L2 writing context, L2 writing and Thai EFL learners, approaches to teaching writing, and three accustomed approaches to teaching L2 writing.

2.1.1 Key Related Perspectives of Writing

Writing has been with the human race for several millennia, and through historical writing, knowledge of various disciplines has been transferred and passed on from one generation to another. Writing not only provides knowledge of reclaiming the past, but it is also an analytical and critical skill for shaping the present and the ensuing future (Coulmas, 2003). This is because, by nature, humans have a desire to preserve and reproduce expressions of their cultural heritage and history, and impart them to latter inheritors to prolong their legacy. Through the wisdom of ancient penmen, we have come to learn about our world history timeline, the development of human history, the development of world languages, and the discovery of a theory of second language acquisition (SLA). Moreover, through dissemination of research findings, we have come to know about the development of theory in second language writing, and the sociocultural theory and teaching L2 learners through CMCW. It is this latter point that this thesis principally attempts to investigate.

Human civilization and prosperity are derived from the antecedent knowledge systematically preserved by ancestors, which they gave to their successors in the form of script, either in the old-fashioned way or in modern form. Without written records, it would be impossible to trace the history of humanity. Coulmas (2013) posits, “If language is the most distinctive inborn trait of our species, writing is our most consequential invention” (p. ix) and “Life without letters is a paradise lost” (p.1). Writing is by virtue imbued with prestige and becomes a window that allows us to see our language, our culture, our society, and open our minds to learn and experience new things (Olson, 1994). According to Gelb (1963, cited in Coulmas, 2003), writing is defined as “a system of human intercommunication by means of conventional visible marks” (p.15), whereas Rogers (2005) defined writing as “the use of graphic marks to represent specific linguistic utterances” (p.2). Rogers’ notion of “writing” is congruent with Schmandt and Erard (2008) who posited that writing is “a system of graphic marks that represent the units of a specific language” (p.7). Writing is not a language but it represents a human language used for non-immediate communication that presents in everyone’s life either actively or

passively. Through this means of communication, we can record worthwhile stories, convey information, and communicate with one another either at a distant location regardless of time across cultures and civilization (Rogers, 2005). From these definitions, we can conclude that writing is a unique mode of human communication that represents language through symbols or marks mutually understood among the literates. Thus, writing in any language plays a vital role in cultivating audiences to their memory lane. In academic settings, learners' writing competency defines their academic success and career advancement. Therefore, an overview of the nature of L2 writing and its significant role in the academic arena are further discussed in the following subsection.

2.1.2 An Overview of the Nature of L2 Writing

Writing is defined as a thinking process in which a writer's ideas, thoughts, and learning experiences are translated into written form (Mora-Flores, 2009) and it is considered one of the most important skills to acquire in an academic setting, particularly in schools from elementary to tertiary level (Lin & Maarof, 2013; Mohamadi, 2018; Thienthong & Suppasetsee, 2016; Wingate & Harper, 2021). However, writing is challenging for L2 learner to master and is perceived as the most difficult language skill to acquire. The reason for writing requires a multiplicity of knowledge, which includes content, context, process, register, rhetorical, and other linguistic features (Bailey & Judd, 2018; Chang & Lee, 2019; Duong, 2015; Dobao, 2014; Grabe & Kaplan, 1996; Hyland, 2003b; Tribble, 1996; Qiu & Lee, 2020; Xu, 2018; Zhang, 2018). Writing is an intricate cognitive activity incorporating many processes and strategies (Ahmad, 2020; Chen, 2019; Cho, 2018; Forbes, 2019; Storch, 2005; Swain, 2001). For writers to write well, they must pay meticulous attention to details and consider their target audience. Because of the perplexing nature of writing, this productive language skill is often neglected in the ESL/EFL classroom and has a minor role in language learning instruction (Coulmas, 2013; Karaca & Inan, 2020; Williams, 2012; Yanguas, 2020). When underqualified teachers poorly instruct this productive skill, learners are negatively affected and they get highly demotivated to acquire writing skills (Karaca & Inan, 2020). In truth, academic writing began evolving into various fields of inquiry as early as the 1980s, such as in the field of applied linguistics,

teaching English to speakers of other languages (TESOL), bilingual education programs in the ESL/EFL context (Matsuda et al., 2003). It is strenuous and painstaking for L2 learners to master the skill (Giltrow et al., 2005). Oftentimes, L2 writers will translate texts directly from their mother tongue (L1) to compose texts in the target language (Khumphee, 2015; Li & Deng, 2019). L2 learners' cultural background and their native language (L1) greatly influences on their L2 writing process when they construct texts in the target language (Yanguas, 2020; Zhao, 2019). The syntactic structures and language styles in L2 are affected by the learners' first language (Darus & Subramaniam, 2009; Yanguas, 2020), which results in depreciation in the view of the literate community or the shibboleth who owns the linguistic capital. Notwithstanding, more language classrooms today consist of learners with diverse backgrounds due to the rapid expansion of the international education system. This has drawn educators and classroom teachers' attention of how to implement writing practices effectively to cater the needs of learners with linguistically diverse backgrounds (Marshall & Marr, 2018). More detail of multilingual learners and L2 writing context is discussed in the following subsection.

2.1.3 Multilingual Learners in L2 Writing Context

Multilingual learners in this study context refers to international university students from Asian countries who are capable of using more than one language in verbal communication in their mainstream classroom where English is used as a medium of instruction. Multilingual learners are also known as L2 learners who use a language other than English (a dominant language of instructions) used at school or at home (Marshall & Marr, 2018). In this present study, multilingual learners are used interchangeably with L2 learners for the research focus. The generic term "multilingualism" often refers to situations where two or more languages are used in classroom instructions or acquiring additional language skills (Aronin & Singleton, 2008) for communication purposes. However, to some contexts, multilingualism is also regarded as bilingualism where two languages are involved (Cenoz, 2013a; Wilson & Soblo, 2020). From this notion, multilingual learners are regarded as L2 learners who acquire an additional language than their native tongue (Sun & Zhang, 2020). Thus, being a multilingual learner is getting more

common today for everyday experiences a person at school or workplace encounters more than one language (Repo, 2020; Conteh, 2019). For many people it is not an extraordinary phenomenon to become multilingual learners. When bilingual parents want to preserve their heritage language (ethnic dialect) and inculcate their children at young age, the youngsters absorb the language intuitively and the acquired language at young age became their native tongue.

In the context of educational institutions, multilingual learners are found elsewhere, particularly in a school where English is used as a medium of instruction or a local public school where immigrants or parents of ethnic tribes enroll their children to a primary education system. Classrooms are increasingly accommodating learners from culturally and linguistically diverse backgrounds when learners attend public schools where English is a prominent language of instruction (Repo, 2020; Rowe, 2019; Shin, 2018). It is undeniable that in several countries today, the class compositions are no longer bilingual but rather multilingual since learners in the same class use many minority languages (Blackledge & Creese, 2010; Galante, 2020; Ünsal, Jakobson, Molander, & Wickman, 2018). Researchers (e.g., Cenoz, 2013b; Cummings, 2021; De Bot, 2008; Larsen-Freeman, 2006; Yang & Sun, 2015; Wilson & Soblo, 2020) explored multilingual learners' L2 writing development and acknowledged that language learning encompasses "all characteristics of dynamic systems depending on initial conditions, self-adaption and self-organization, complete interconnectedness, and dependence on internal and external resources" (Yang & Sun, 2015, p. 299). L2 learners who are competent to produce the third language may employ relatively similar strategies as they acquire a non-native language or the second language. However, a great benefit for bilingual or multilingual writers is while composing texts they can refer to their prior linguistic repertoire or primary language resources (Dobao, 2020; Forbes, 2019; Wilson & Soblo, 2020) to plan, construct, and organize ideas before writing in English (Garcia & Kano, 2014; Yanguas, 2020). In other words, individual learners who are competent in two languages deem to perceive things around them through two language systems in which the monolinguals do not have such privilege (De Angelis, 2007). Other diverse elements that propel L2 learners or multilingual

learners to succeed in acquiring a non-native language or additional language include motivation, self-determination, age, order of acquisition and teaching methods (Cenoz, 2013b; Rebo, 2020), learner's academic factor, learner's psychological factor, and nature of writing, educational context, and the writing instructor influence in the classroom (Karaca & Inan, 2020). Previous studies (e.g., Cenoz, 2003, Forbes, 2019; Thomassen & Munthe, 2020) posited that multilingual learners tend to increase their metalingual and language learning awareness while constructing texts in an additional language; however, this prevailing phenomenon occurs when learners are actively engaged in the learning process. Learners rely on prior knowledge from their first acquired language and on whatever they perceive as relevant to the tasks they are dealing with at that moment (De Angelis, 2007; Guo, Bussey, & Adachi, 2020; Wilson & Soblo, 2020; Yanguas, 2020). On account of lexical organization in L2 language learning acquisition, words that are used more frequently will be kept active and maintained in a long-term memory; in reverse, lexicon that is inactively rehearsed can decrease rapidly from the working memory (De Angelis, 2007). With reference to long-term memory storage capacity for determining language acquisition, the acquired linguistic knowledge must be constantly drilled to strengthen production processes in some useful manners. This infers that L2 learners or multilingual learners have more linguistic resources to count on. Previous studies asserted that learning an additional language can foster individual's cognitive development (e.g., Cenoz, 2003; Gunnarsson, 2019; Forbes, 2019; Marshall & Marr, 2018; Repo, 2020) and keep our brains staying active in old age (Sanz, 2000).

Therefore, writing instructors should view multilingual learners' prior linguistic knowledge as a beneficial resource rather than a barrier to acquire a non-native language (Lin, 2013; Galante, 2020; Villegas et. al., 2018). Teachers ought to embrace diversity and encourage learners to write and share their cultural values, beliefs, experiences, tradition, or lifestyles practiced in their vernacular communities rather than introduce alien materials to learners or promote "English shibboleth" policy, or treat the language as the only sacred language in the world society (Buripakdi, 2012). Choosing appropriate writing topics that respond to the needs of students will stimulate them to utilize their full linguistic

repertoires (Canagarajah, 2012; Garcia & Kano, 2014; Repo, 2020; Villegas et al., 2018; Wilson & Soblo, 2020) and they produce work more creatively. Writing instructors may group learners by language background to support one another while constructing texts, and use relevant model essays composed by bilingual or multilingual writers to guide their writing. Bilingual or multilingual learners may encounter challenges when they are required to follow the rules and writing convention of standard English, but when they are given space to gain voice and express their values in the dominant discourses, they may slowly construct their identities through committed literacy practices (Villegas et al., 2018) and optimize their learning opportunities. Writing instructors that welcome learners' diverse linguistic repertoires are advocates who propel learners to become competent bilingual writers in the near future. Therefore, teaching L2 learners to construct texts in a non-native language is demanding but rewarding when seeing non-proficient writers make their path to academic success. These challenges, obstacles, and promissory stories are further discussed in the following subsection where the present study was conducted.

2.1.4 Characteristics of Multilingual Learners

Multilingual learners in the English language classroom present at Asia-Pacific International University (AIU) where this study was carried out can be divided into two groups. The first group is international visa students representing countries in Asia, including Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, the Philippines, and Vietnam, and the second group is Thai residents. The two distinctive groups may possess different characteristics. The international students from these Asian nations have brought with them varied English language learning experiences. For example, Indian and Filipino students, although speaking Hindi and Tagalog as their mother tongue at home, these students learned English at school from very young age. English language education starts in most private schools as early as the pre-school levels in countries such as the Philippines and India (Kirkpatrick, 2016). Therefore, learners have more exposure to English, and their English proficiency level is more advanced than those foreign students from other Southeast Asian countries including Cambodia, Indonesia, Laos, Myanmar, and Vietnam, who learn English as a foreign language from elementary school but rarely use the

language outside the classroom (Nunan, 2003). Although these foreign students possess varied English learning experiences from primary to high school education, ranging from 8 to 15 years prior to enrolling in a four-year undergraduate study program, at the university they have equal chances to improve English language skills taught by mainly non-native English-speaking (NNES) teachers. These students perceive the status of English as the main language of technology, science, business, education, and entertainment industry (Crystal, 2003). Nonetheless, the majority of these foreign students have not been fully immersed in an English-speaking classroom environment while in secondary or high school. Therefore, their language skills and competence are trivial compared to their peers with more language exposure (Nunan, 2003).

These multilingual learners have brought with them unique learning styles including social (interpersonal) learning and solitary (intrapersonal) learning styles. Admittedly, their cultural differences influence learning performance. Collectivistic learners value the needs of a group over the individual and group work is significant, whereas solitary learners or individualistic learners direct their learning behaviour to achieve individual goals (Aparicio, Bacao, & Oliveira, 2016). However, based on the cultural backgrounds, these learners are from collectivist cultures as Asian people, including Cambodia, Chinese, Indonesian, Malaysian, and Thai, hold a belief of interdependent view of self as part of social network and cherish collective success and group cohesion (Hofstede, 1991). Triandis (1995) posited that a typical collectivistic culture, such as Chinese and Malay discerns direct confrontation impolite and it is inappropriate to disagree or dispute against someone's opinion in class. Vietnamese university students prefer to work with their close friends who can support their learning and rely on guidance from the teachers (Hanh & de Nooy, 2020). In a similar vein, Exley (2005) claimed that Asian learners such as Indonesians are described as receptive and obedient to their teachers. They prefer auditory learning style to acquire knowledge by listening attentively to the instructors in class (Arjulayana, 2016). Similar to Thai learners, they perceived instructors as the primary source of knowledge who they can count on (Tapinta, 2016). Likewise, Malaysian students prefer to work in small groups or in pair, and they learn through

listening, reading, and taking notes (Razawi et al., 2011). Contrary to individualistic cultures of western countries, learners are encouraged to be self-reliant, independent, and directive to achieve personal goals (Hofstede, 1991). Western learners are free to challenge their instructors with a reasonable course of action, and disagreement with others' opinions or defending one's position in class is customary.

Nevertheless, research studies (e.g., Lu, 2008; Mathias, Bruce, & Newton, 2013) argue that due to the influence of the western culture embedded in educational systems, both collectivism and individualism have shown coexistence in the modern Asian society. Chinese learners were found to develop self-oriented personality and prefer individual learning style due to rigorous competition in the Chinese education system (Wong, 2015). Likewise, Nguyen (2019) advocated that Vietnam is perceived to have a strong background of collectivist culture; however, Vietnamese schools tend to encourage learners to be independent, and academic competitions are held explicitly both inter-class or interschool activities nationwide. Promoting learner autonomy in an EFL classroom to encourage learners to take self-directed learning, individualized-instruction, and independent thinking becomes more prevalent in a collectivist culture (Yuliani & Lengkanawati, 2017).

However, to date, research studies in investigating multilingual English language learners from collectivist cultures in Asian countries who possess diverse L1 and cultural backgrounds performing CW tasks in small groups using a web-based writing platform such as Google Docs are still scarce. More studies are needed to delve into group writing in a multilingual English writing classroom to enrich the knowledge of CW among learners with diverse linguistic and cultural backgrounds. The following subsection discusses L2 writing in Thai EFL classrooms.

2.1.5 L2 Writing and Thai EFL Learners

Thai EFL learners perceive English writing as the most difficult language skill to acquire (Piamsai, 2020; Sermsook et al., 2017; Watcharapunyawong & Usaha, 2013; Waelateh et al., 2019). A reason for this is writing involves complex cognitive processes, multifaceted phenomenon, and multiplicity of knowledge, which includes rhetorical and

linguistic features, specific terms to certain language discourses, and sociocultural dimensions (Bailey & Judd, 2018; Chang & Lee, 2019; Karaca & Inan, 2020; Zhang, 2018). Furthermore, the different syntactic structures and morphological system of learners' L1 can negatively affect their English text construction, particularly when they compose academic texts. Previous studies (e.g., Phoocharoensil et al., 2016; Phetdannuea & Ngonkum, 2016; Waelateh et al., 2019) reported that interlingual (wrongly employing L1 sentence structures or grammatical rules in constructing sentences in L2), and intralingual errors (incomplete application of target language rules or forms, ignorance of language forms, or false analogy, or overgeneralization) are the major sources of errors Thai EFL learners often committed. Thai has unique characteristics of writing styles, such as uninflected form of verbs, no articles, no change of plural nouns, no punctuation in each sentence, no space among words, subject and object pronouns can be omitted if they can be worked out from the context, adjectives come after nouns, and many more that are dissimilar to English grammatical rules. These different forms of writing influence Thai EFL learners as they compose texts in English (Phetdannuea & Ngonkum, 2016; Sermsook et al., 2017; Waelateh et al., 2019).

Other researchers (e.g., Arakkitsakul, 2019; Noom-ura, 2013; Saengboon, 2017; Loan, 2019) posited that Thai EFL learners are not able to accomplish much in mastering the language skills compared to their peers from the neighboring countries of Southeast Asian nations. This is due to the lack of learning motivation, poorly trained to acquire the language skills from primary and high school education, and lack of opportunity to practice English in a real-life situation. Teacher-directed orientation and traditional teaching methods where learners as passive listeners and receivers of knowledge are deeply rooted in the Thai education system (Gauthier & Punyasavatsut, 2019; Hayes, 2010; Ka-kan-dee & Kaur, 2015; Loan, 2019). Hayes (2010) reported that local Thai teachers who teach English in rural schools have not received adequate training to teach the language and many of them are not qualified to instruct English lessons. Thai EFL pre-service teachers lack critical thinking and analytical skills to orient themselves in examining and evaluating their own apprenticeship in responding to learners' needs (Loan, 2019). Less qualified language

teachers severely affect learners' academic performance and learning motivation (Karaca & Inan, 2020; Wu et al., 2019). Ka-kan-dee and Kaur's (2015) study revealed that Thai EFL learners could not produce proper argumentative essays for they were not familiar with such writing genre. The researchers claimed that Thai EFL university students lack ability to compose logical argumentative essays because they did not receive proper training to practice writing skills in high school. Thai learners' English language writing is considered problematic and substandard (Boonyarattanasoontorn, 2017; Iamla-Ong, 2013; Sundrarajun, 2020) and their writing conventions are influenced by the cultural knowledge and L1 lexical and discourse interferences (Bennui, 2008; Lun, Kanokkamalade, & Kalinchan, 2020).

Despite the challenges and unpleasant experiences of teaching academic writing to Thai EFL learners and perceiving their slow progress in mastering the language skills, there are educators and researchers who step out of the norm of teacher-centered instruction and opt for modern teaching techniques to develop their learners' writing skills. McDonough and De Vleeschauwer (2019) compared the individual and CW during the prewriting stage of Thai EFL university students who enrolled in the critical reading and writing course. The findings revealed that the students who had planned collaboratively produced texts that are more accurate when they later composed writing tasks on their own. This has proven that CW (peer-led learning activity) can improve learners' writing performance. Piamsai (2020) examined the effect of scaffolding teaching strategies on Thai university students' writing performance by adapting the scaffolding framework earlier proposed by Cotterall and Cohen (2003), Spycher (2017), and Walqui (2006) that includes affective scaffolding, cognitive scaffolding, and metacognitive scaffolding, throughout the writing process. The researcher found that the participants' English writing performance showed a significant improvement in terms of writing competency which included organization, accuracy, lexical choice, and structure. Thus, scaffolding strategies mandated in the writing process can improve writing skills.

In that same year, Coffin (2020) investigated the process of the implementation of CW in Thai EFL learners' English writing classroom by employing multiple sources and

research instruments that include document analysis, observation and video records, survey questionnaire, and semi-structured interviews. The findings revealed that both learners and English language teachers perceived CW activities positively affect communicative interactions, teamwork, and problem-solving skills. The researcher posited that CW practice should be implemented in EFL writing classrooms as it enhances language skills. Furthermore, Thongchalem and Jarunthawatchai (2020) employed the genre-based approach to teach academic writing to Thai EFL learners who were enrolled in the Reading and Writing course at a public university in a northeastern province. The teaching cycle of the genre-based approach includes modeling texts, joint construction, and reflection. The findings showed that learners made a significant improvement in language features and rhetorical organization. The students perceived that CW during the joint construction could enhance their writing competence and boost their confidence in producing texts in the target language.

More recently, Bacon, Satienchayakorn, and Prakaiborisuth (2021), examined Thai EFL learners' involvement in a peer-assisted learning center guided by the "seamless learning" approach (a learning notion that integrate varied learning efforts in different venues including formal or informal learning settings) to improve their English academic writing skills. The findings showed that the integration of seamless learning into a peer-assisted learning center could significantly improve learners' writing skills.

The five empirical studies related to L2 writing in a Thai context that have previously been reviewed are examples of writing instructors taking stepping stones to improve Thai EFL learners' academic writing skills and help boost their writing confidence through collaborative learning and scaffolding strategies. The researchers employed process writing and genre-based approaches, adapted the guidelines to suit the writing context, and moved the teaching instructions towards learner-initiated learning. As a result, writing skills could be improved through guidance, creative teaching techniques, and adaptive writing approaches. There are a lot more techniques or strategies that are productive awaiting to be explored in EFL writing classrooms. Instructors, therefore, need to leave their comfort zone and look for hidden treasures and transform the non-proficient

L2 learners to be skillful penmen. It is important for non-native language learners to learn appropriate writing strategies (Forbes, 2019; Thongchalerms & Jarunthawatchai, 2020) and master the writing skills in the tertiary education domain (Bacon et al., 2021). L2 learners need guidance and proper writing training to become effective writers and be able to express themselves in a more salient and authorial voice (Matsuda, 2001). Aside from practical teaching and learning approaches, there are other factors that may influence learners learning experience and performance while performing a writing task. Some of the factors influencing L2 writer's performance in group work is discussed in the following subsection.

2.1.6 Factors Shaping L2 Learners' Writing Performance

To reach a comprehensive understanding of L2 learners' English writing performance, it is crucial to recognize potential factors that may shape or influence individual or group writing performance in one way or the other. These factors include (1) goals, (2) language proficiency, (3) learners' roles, and (4) task type.

Goals

Individual goals may shape their learning behaviours in L2 writing contexts. Cumming (2012) posited that goals are unpredictable on learning contexts, and learners' motivations are observed "through behaviours that focus on particular goals, which can be articulated, analyzed, and altered" (p.138). Learners' divergent goal orientations shape their interaction when performing a group task (Li & Zhu, 2017). Storch (2005), argued that in collaborative work, members' goals affect their patterns of interaction. For instance, collaborators who compete to display their knowledge would exhibit prominent role and focus on self, whereas a collaborative pair displayed their shared goal in supporting each other to complete the task collectively. Therefore, a goal-directed action in group work is perceived to shape collaboration and interaction patterns.

Language Proficiency

Learners' English language proficiency is a significant factor in group writing that drives the team to a successful collaboration (Zhang & Hyland, 2018). Inevitably, in a multilingual English learners' classroom context, individual members bring differing levels

of linguistic and cultural backgrounds (Yim, 2017). Some learners were enrolled in a school which offers English language education as early as in kindergarten level, whereas some started learning proper English only when they entered secondary education. Researchers (e.g., Dobao, 2012; Storch 2002, 2005) posited that a CW task among L2 learners can be more productive and successful when members are grouped with mixed-ability learners: high proficiency learners working with lower proficiency partners. Nonetheless, other studies (e.g., Bahar, 2003) argued that less capable partners' inputs are often neglected or rejected by peers with higher language proficiency. Thus, less capable learners prefer to work with peers of similar level of language skills (Yim, 2017). At another end, researchers (e.g., Chen, 2019; McDonough & De Vleeschauwer, 2019) reported that mixed-ability groups whose members actively participated in CW tasks would subsequently develop their writing skills on an individual level. The conflicting results in previous studies infer that further investigations are needed into how L2 learners from heterogenous language competencies collaborate in small groups, with the integration of web-based tools to assist the CW process.

Learners' Role

Individual members in the group play an essential role in shaping group collaboration. Members need to have a clear role or responsibility to act. Group members with specialized knowledge, language ability, and leadership skills may take initiative to lead the team. Kukulska-Hulme (2004) advocated that a successful collaboration derived from active participation of team members with apparent roles and responsibilities. Furthermore, collective efforts became more momentous when the team had a supportive leader. According to Ede and Lunsford (1990), each member in the group carries out a divergent role in contributing towards a CW task. The team may plan and outline the paper together or assign individuals to draft a part based on their expertise, or the team assigns one member to write a draft and another person or more persons to revise the draft without consulting the writer of that first draft. In some cases, one member acts as a leader to assign writing tasks and each teammate to carry out the designated task, and then one person compiles the parts and revises the whole. In certain instances, one

person dictates, another person transcribes and revises for the group. However, a successful group needs collective efforts and each member's role and responsibility must be clearly defined (Lowry et al., 2004).

Task Type

Previous studies on CW projects admitted that the types of tasks L2 learners collaborate could facilitate or shape their interactions or collaborative dialogue. For example, Aydin and Yildiz (2014) analyzed L2 learners' writing revision behaviours on wiki-based CW tasks on three different genres: argumentative, decision-making, and informative tasks. The researchers found that the argumentative essay promoted more collective efforts on making corrections than the other tasks, whereas the informative task allowed learners to make a clearer division of labor than the other two tasks. Other researchers (e.g., Storch 2011; Li, 2014; Yim, 2017) argued that learners co-constructing essays or reports of more familiar topics tended to write longer texts and increased chances of negotiations and peer interactions. Therefore, task choices are perceived to affect the degree to which learners engage in CW dialogue. Furthermore, Alghasab, Hardman, and Handley (2019) examined EFL learners' online interaction via wiki-based CW activities for a period of eight-weeks. The researchers found when the teachers took a more directive approach by providing comments to students, the students chose to interact with the teacher rather than with their peers. However, when the teachers adopted a more dialogic approach in giving feedback to the group, learners tended to interact more and put more collaborative endeavors, leading to successful construction of texts. The use of computer-mediated communication (CMC) tools motivated learner engagement and participation in group writing and increased social interaction and peer interactions (Williams & Beam, 2019). Nonetheless, the distinct mechanisms through which types of tasks influence the patterns of interaction in small group collaboration in L2 writing class needs further investigation. L2 learners who learn English as their foreign language, therefore, need to be inculcated through proper teaching methods and they need to invest adequate time honing the language skills. As known, teaching writing skills to L2 writers encompasses three major writing approaches. The three main approaches have been advocated and

used in the last few decades of teaching English to ESL/ EFL learners in various school settings. Further details of these approaches to teaching writing are explained in the following section.

2.1.7 Approaches to Teaching L2 Writing

Hasan and Akhand (2010) introduced three major approaches to teach writing in the ESL/EFL classroom. The three approaches are product approach, process approach, and genre approach. When teaching a foreign language, English in particular, to learners of mixed ability in the Asian context, a language teacher may need to employ integrated approaches among these three because one distinctive approach may not satisfy the need of learners with diverse linguistic and cultural backgrounds (Linh, 2015). Some learners are keen to follow the product approach, while others are more fruitful in the process approach when they are to compose a writing task. However, over the last two decades, the product and process approaches have dominated much of the writing tasks in ESL/EFL classrooms, whereas the genre approach has grown immensely over the last 10 years (Hasan & Akhand, 2010; Hyland, 2007). These aforementioned approaches for teaching writing are defined, described, and explained as follows.

2.1.7.1 Product Approach

This writing approach focuses on perceivable aspects of writing that can be examined by viewing writing as textual products in which the focus is on the material form. Attention is given to the linguistic and rhetorical resources and usage (Samsudin, 2015). Learners honed their skills in this writing approach would receive constant practice on linguistic knowledge, with attention focused on the correct use of words, phrases, grammar and syntax, as well as language cohesive devices (Pincas, 1982, cited in Badger & White, 2000). Thus, to some scholars, the product approach is considered a traditional approach in which learners are given guidelines and writing models with relevant text-type or vocabulary as examples to imitate (Gabrielatos, 2002). Writing tasks are usually presented with model text used for this approach and analyzed at an early stage of learning about writing (Steele, 2004). Imitating the guided writing lessons as well as

carefully observing the use of sentence structure and linguistic features can prepare inexperienced writers to overcome writing hurdles when they move on to a higher level.

Steele (2004) posited that the product approach model in writing consists of four stages: familiarization; controlled writing; guided writing; and free writing. Detailed information on each stage is explained precisely in the following paragraphs.

Stage 1: Familiarization. This stage attempts to raise learners' awareness of certain language features of a particular text or genre. The features of the specific genre are highlighted and learners' attention may be drawn to the importance of those language features.

Stage 2: Controlled writing. This stage controls learners to practice the highlighted features, usually in isolation.

Stage 3: Guided writing (Badger & White, 2000) or organization of ideas (Steele, 2004). This stage is considered the most salient and is where ideas are organized and put in proper order.

Stage 4: Freewriting. This is the result of the learning process after learners are carefully guided through the preliminary stages. Learners can begin their own writing by practicing the language features or the features of specific genres that are introduced to them.

The main objective of the product-based approach is to create appropriate texts with the focus on the proper use of grammar and syntax. Badger and White (2000) asserted that the product-based approach perceived as writing chiefly concerned with knowledge of language structure and form of texts given by the instructor of the writing course. This writing approach is perceived to be more appropriate for beginners and enables them to practice the language skills that can prepare them to move on to a higher level. Because of the inadequacy of self-propelled initiatives in writing development lies in the product-based approach, writing experts introduced the process approach that can further permit upscaling beginners writing skills to a higher level. Detailed information of the process approach is explained as follows.

2.1.7.2 Process Approach

The process approach perceives writing as a process in which the writer seeks to generate ideas and revisits those unpolished ideas to refine and reconstruct them in an attempt to interpret meaning (Samsudin, 2015). According to this scheme, learners can compose texts based on their brainstormed ideas. They can collect information, and they are able to choose a topic they are keenly interested in to work on but they also obtain feedback from peers or teachers during the writing process. As Polio and Williams (2009) indicated, writing is an “exploratory and recursive, rather than linear, pre-determined process, and often peers intervene at one or several points in the writing process” (p. 491). Writing in the process approach is mainly concerned with linguistic skills, such as planning, drafting, and revising, and linguistic knowledge such as grammar and sentence structure may be less emphasized as seen in the product approach (Badger & White, 2000). The process approach puts more emphasis on what writers do as they compose a text rather than on textual features and the role of learners is rather that of an independent producer of texts (Curry & Hewings, 2003; Duong, 2015). Therefore, writing in the process approach stimulates learners to develop their use of language and obtain additional linguistic resources from the teacher and from peer feedback during the writing process.

According to Curry and Hewings (2003), there are seven primary stages for the process approach model in teaching writing: prewriting, planning, drafting, reflecting, peer/tutor review, revising, editing and proofreading. The process writing stages are illustrated in Figure 2.1.

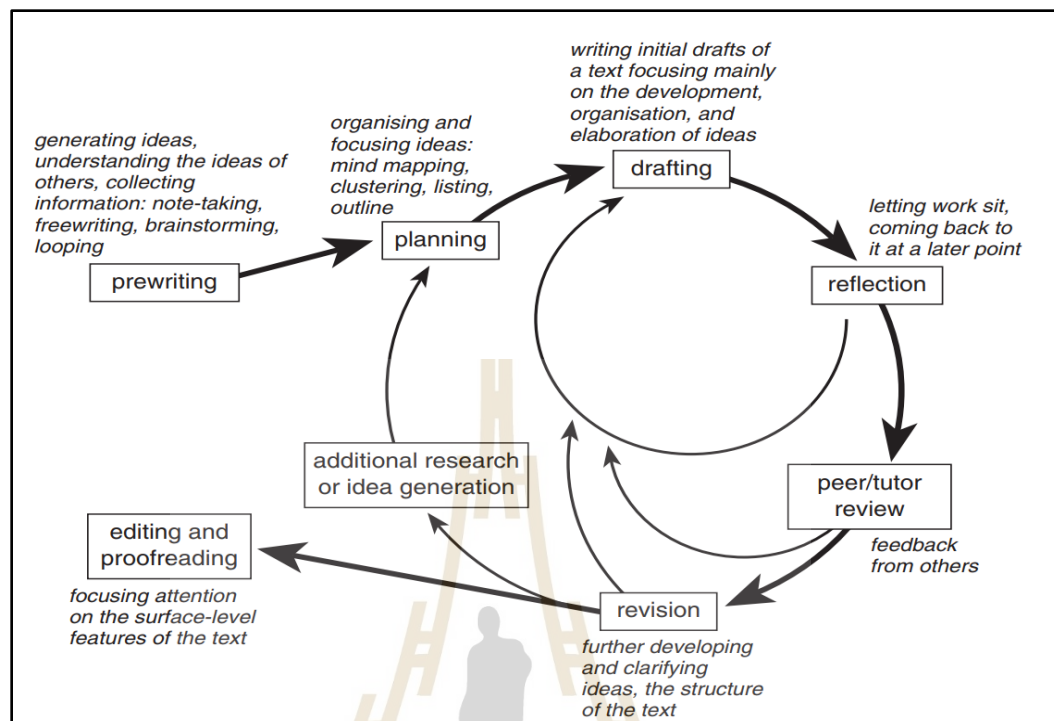


Figure 2.1 The Writing Process Approach (Curry & Hewings, 2003, p. 34)

As seen in Figure 2.1, writing is truly an exploratory and recursive process that involves various stages. The seven stages proposed by Curry and Hewings (2003) are discussed as follows.

Stage 1: Prewriting. At this stage, learners are encouraged to generate and brainstorm for ideas, collect information, and make notes of what comes into mind. At the prewriting stage, strategies such as brainstorming and freewriting are useful as they help writers to explore ideas, formulate thoughts, and gather information relevant to a particular topic.

Stage 2: Planning. Learners are stimulated to organize and focus on formulated ideas at this stage. Useful strategies such as mind mapping, clustering, making an outline for a topic are introduced to learners.

Stage 3: Drafting. At this stage, learners may work individually or in pairs or groups depending on the nature of the writing task. In a rough draft version or a first

draft writing, writers should focus mainly on the development of ideas, organization, or information collected from the prewriting strategies.

Stage 4: Reflecting. According to Curry and Hewings (2003), reflecting simply means, “letting a piece of writing sit before coming back to it with a fresh pair of eyes” (p.41). Reflecting enables writers to observe flaws or gaps in sentence structure, word choice, or use of evidence to support the writing.

Stage 5: Peer/tutor review. At this stage, attempts are made to reassess the writing product with support from teachers, peer feedback or other comments to improve the quality of writing. Peer review is perceived to increase students’ domain-specific knowledge levels as well as engage them in active learning (Bhowmik et al., 2018; Wigglesworth & Storch, 2009; Zhang & Hyland, 2018). The process of peer review may be carried out in pairs or in a small group.

Stage 6: Revising. At this stage, learners are encouraged to further develop and clarify their articulated ideas describing in the written text as well as improving the structure of the text or its linguistic features.

Stage 7: Editing and proofreading. At this final stage, learners need to focus on linguistic accuracy, rules of language mechanics, formatting, and references used in the content. The teacher in the writing class may assist learners by encouraging them to follow a peer editing process, learning to use proofreading symbols, a revision guide, or even using a computer for spelling check programs (Duong, 2015; Samsudin, 2015; Lim & Phua, 2019).

As explained previously, the process approach focuses on how texts are produced rather than the outcome. Writing is, therefore, viewed as complex and recursive (Forbes, 2019; Martinez et al., 2020; Zhang & Hyland, 2018). The teacher becomes a facilitator in a process-based writing approach, whereas students are more self-directed learners. Feedback and revision are perceived as a key element in the process writing approach. Through process writing, learners are challenged to analyze and organize their ideas (Barnett, 1992), develop cooperation with their peers (Nunan, 1991), and find opportunities to manage and control their own writing (Brown, 2001; Nicolaidou, 2012).

However, educators have recognized that explicit teaching of writing is inevitable, whereby forms of different genres need to be taught to learners to get assimilated into the target culture and social context (Elson, 2011; Gibbons, 2014). To some researchers (e.g., Elson, 2011; Gibbons, 2014; Hyland, 2003b), the process approach is deemed to solely focus the language skills and processes of writing in the language classroom. Consequently, the approach may fail to address social, cultural, and linguistic knowledge, or perceived understanding in a particular culture or community (Gibbons, 2014). For this reason, educators have adopted a new banner approach known as the “genre approach” to train writers to get familiar with different types of writing genres. The genre approach is discussed in the following subsection.

2.1.7.3 Genre Approach

The genre approach views writing as a social and cultural practice in which learners acquire the knowledge of a particular genre for social and communicative success (Dirgeyasa, 2016; Gibbons, 2014; Hasan & Akland, 2010; Hyland, 2003a; Visser & Sukavatee, 2020). In the view of those promoting the genre-based approach, linguistics becomes a practical tool that language teachers can use in their class and review to show learners how distinctive patterns of lexis, grammar, syntax, or structure sequentially support each particular genre (Hyland, 2007). However, some researchers argue that there are some similarities with the product approach, since both of them perceive writing as primarily linguistic input with emphasis on correct syntax. Nevertheless, the genre approach focuses writing more on the social context to be accepted by the target community or readership (Badger & White, 2000). In other words, it refers to socially recognized ways of using the language to comply with the community norms (Hyland, 2003a) or using the language to achieve common goals shared in a particular society or culture (Gibbons, 2014). Swales (1990) defines genre as “a class of communicative event, the members of which share some set of communicative purpose” (p. 58). This implies that learners of the language need to acquire language registers, styles, or specific terms commonly used by a particular group of community or professional organizations.

A genre-based approach to develop writing skills underlines readers as its nexus and writing seeks to accomplish its purpose through being socially accepted by a community of readers who shares the same social norms. This indicates that learners of the language need to produce a written message for the audience who may be known or unknown to them or someone who authorizes the language assets (Duong, 2015). Munice (2002, cited in Hasan & Akland, 2010) posits that the genre approach draws its focus on the reader and on the conventions that a piece of writing must follow. Certain rules are accepted by the readership. A genre-based writer, therefore, needs to develop a writing style to meet social norms. Nevertheless, Hyland (2003a) argues that at first glance in the process of writing, teachers may take an authoritative role to scaffold or assist learners, but when learners become more independent and able to construct their own writing parallel to the model provided, the role of the teacher will shift from distinct mentor to facilitator.

Genre-based writing has its own linguistic features such as rhetorical structure, grammatical pattern, language register, or lexical units (Dalimunte & Pramoolsook, 2020; Dirgeyasa, 2016; Hyland 2003a; Visser & Sukavatee, 2020; Worden, 2019), and the writing has distinctive characteristics, produced for a particular target audience with a specific purpose (Coulmas, 2013). For example, an argument essay, which aims to persuade audiences to take a position on an issue, justifies it, or convinces them to admit the writer's point of view. This writing genre perceived to be one of the most difficult genres for students to master (Elson, 2011; Wingate, 2012). The text in argumentative writing may follow a defined structure, such as a statement raised by the author with controversial or debatable issues accompanied by some background information - argument 1 supported by evidence; argument 2 supported by evidence, and so forth; recapitulating and concluding with the author's position and some recommendation (Gibbons, 2014). Argumentative writing is explained in sequential order with logical reasons, and thus connectives and conjunctions associated with reasoning are used extendedly. Language features (words or phrases) related to the debatable issue are employed precisely to indicate the author's stance toward the issue (Gibbons, 2014;

Wingate, 2012). Hence, the teacher of an argumentative writing course needs to introduce the process and model the language features used in this particular genre.

Teaching and learning of writing through a genre-based approach consist of three stages: modeling a text, joint construction, and independent construction of a text (Hyland, 2003b). The flow chart is shown in Figure 2.2, with cyclic procedures of teaching and learning of writing through a genre-based approach initially developed by linguists and educators in Australia (Gebhard, 2019).

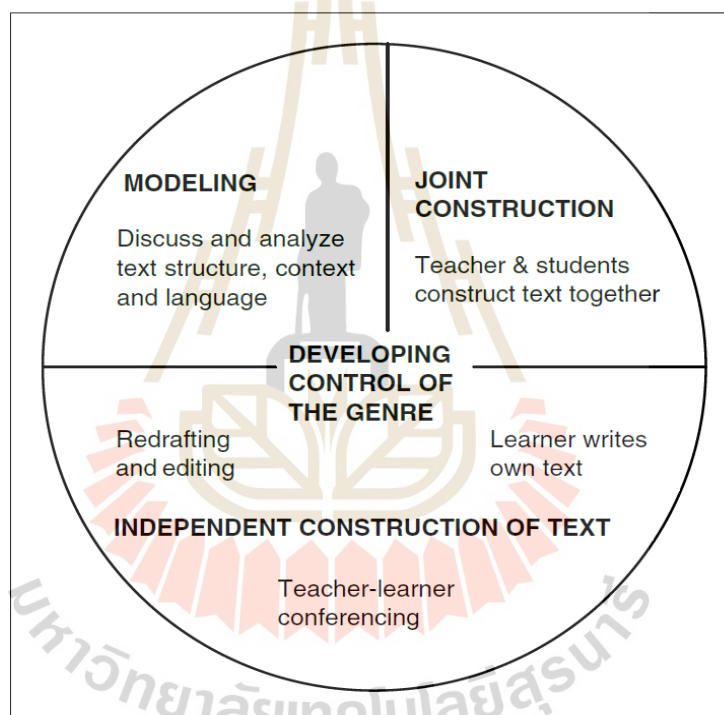


Figure 2.2 The Teaching and Learning Cycle (Hyland 2003b, p. 21).

As seen in Figure 2.2, the genre teaching and learning cycle involves three major stages that can hone language learners to write more systematically from a dependent step to a more independent step by employing distinctive linguistic characteristics. The three stages embedded in the genre-based writing are discussed as follows.

Stage 1: Model a text. At this level, the teacher chooses a certain type of genre and brings it to class to discuss and analyze text structure with learners. The teacher directs learners to the context and models the language used in that particular genre to serve the communicative purpose. Learners study lexical items, grammatical or structural patterns, and practice the language textual features used in that particular genre (Dirgeyasa, 2016; Gibbons, 2014; Worden, 2019) to work on their text.

Stage 2: Joint construction. Learners are guided to write by using words or phrases given, and they can manipulate them to fit their context by following the model given. The focal points are on demonstrating the process of producing a text type as well as discussing with learners concerning language features associated with the particular genre (Gibbons, 2014). Normally, learners will work to construct texts with the help of their teacher at this stage.

Stage 3: Independent construction of a text. At this last stage of the genre writing approach, learners discover how to construct a certain type of genre they have learned from the previous stages. The teacher will let them construct a text independently and they now gain autonomy in manipulating what they have acquired. However, the teacher must ensure that learners truly understand the features of a particular genre (Dirgeyasa, 2016) to produce appropriate texts acceptable in the target readership.

We can see that in the genre-based writing approach, language learners are honed to produce linguistic features, style, register, and rhetorical patterns and language becomes a practical tool that serves their communicative purpose. The genre-based approach, therefore, becomes the newest writing approach among the major three approaches and is perceived to be effective in teaching university students to be acquainted with different genres of academic writing (Hyland, 2007; Visser & Sukavatee, 2020; Worden, 2019).

The following subsection compares the three different writing approaches and precisely discusses their advantages and disadvantages.

2.1.8 Comparing Product, Process, and Genre Approaches

Normally in L2 writing classrooms, learners are of mixed-ability and this results in the employment of the mixture of more than one writing approach. Oftentimes, the writing teacher will combine these common writing approaches corresponding to the needs of learners, and make use of these orientations more effectively. Table 2.1 compares product, process, and genre writing approaches based on Badger & White (2000), Hasan & Akhand (2010), Hyland (2003b), and Nordin & Mohammad's (2006) model to teaching writing.

Table 2.1 Comparison of Product, Process, and Genre Approaches in Teaching Writing

Attribute	Product	Process	Genre
Main Idea	Writing is concerned with the knowledge of language structure, appropriate use of words, syntax, linguistic features.	Writing is a thinking process which involves planning and drafting, the act of writing is emphasized.	Writing is a social activity and its main concern is the final product accepted by its readership.
Teaching Focus	Emphasis is on rhetorical drills and end product.	Emphasis is on writer's expressions, language skills and process.	Emphasis is on readers' expectations and the end product.
Advantages	Learners are trained to produce texts with correct structure by following linguistic features as a way to build up writing skills.	Learners are trained to produce texts in a logical structure and link ideas; makes process of writing transparent and provides basis for teaching; skills involved in writing learners bring to classroom contribute to writing ability.	Learners are trained to write and express social purpose more effectively; makes textual conventions transparent; contextualizes writing for purpose that serves audience in social situations.
Disadvantages	Learners are given a small role and the knowledge and skills learners bring to the classroom are undervalued and neglected.	Assumes L1 and L2 writing similar; overlooks L2 language difficulties; insufficient importance to the kind of texts writers produce.	Requires rhetorical understanding of texts; can result in prescriptive teaching of texts; can lead to over attention to written products; and can ignore processes of writing production.

(Adapted and modified from Badger & White, 2000; Hasan & Akhand, 2010; Hyland, 2003b; Nordin & Mohammad, 2006 model to teaching writing)

As we can see from the elaborated details of the three different writing approaches outlined, the product approach is perceived to be more appropriate for teaching beginners. Learners need adequate lexical knowledge as well as knowledge of language structures and grammatical rules to express themselves in the written form. For this reason, learners are guided to improve their writing skills by imitating patterns or forms of language structures. Move on to the process-based writing, learners are honed to develop linguistic skills, formulate thoughts, organize ideas, and express themselves logically in the text. Teacher or peer feedback is crucial as it helps clarify ideas and improves the quality of writing. This results in learning achievement (Forbes, 2019), as well as providing opportunities to enhance writing skills when individuals learn from their more capable peers (Zhao, 2018). The process-based approach prepares learners to be acquainted with writing strategies and the development of linguistic skills. However, learners need additional linguistic resources to express themselves effectively and be acceptable in a particular social context or culture. In other words, learners of a foreign language, particularly in academic settings such as university level, need to learn different types of academic discourse and participate in social and cultural contexts beyond their own (Hyland, 2007). Therefore, the genre-based writing approach was developed to enrich learners' writing experience as they pull together linguistic resources and offers learners an explicit understanding of how target texts are structured in such a way (Hyland, 2007).

Genre-based writing, therefore, enables learners to write in order to pursue a specific goal and be accepted by writing communities in different social contexts. We can see that the genre-based writing approach incorporates both product and process-based writing approaches into one as one coin with two facets (Dirgeyasa, 2016). Genre is perceived as a product approach because it has distinctive patterns of linguistic features with a communicative purpose. Genre can be thought of as process writing because it has systematic orders to follow (Dirgeyasa, 2016; Worden, 2019) and writers need to revise and get feedback from teachers or peers to improve the quality of text in order to convey the message to the target audience more effectively and achieve its communicative goal.

The genre-based approach is one of the newest and most effective approaches to teach academic writing in a university setting due to its clear communication objectives with explicit outcomes (Huang & Jun, 2020; Hyland, 2007; Ueasiriphan & Tangkiengsirisin, 2019).

The present research, therefore, employed the genre-based approach with an integration of process writing approach in the English composition course. The two writing approaches integrated was initially proposed by Badger and White (2000) in which the researchers term it “the integrated process-genre approach” (p.159) with a belief that a combination of two writing approaches will provide “a range of advantages including more focused used of text models” (Rusinovci, 2015 p. 702) without removing elements of other approaches. In the present study, the researcher required learners to form small groups of three or four with culturally diverse backgrounds to compose two distinctive essays consisting of description and argumentation in GD to investigate the effects of CW activities and explore the learners’ CW interaction patterns as well as their use of language functions (LFs) while performing group tasks. The researcher introduced descriptive and argumentative essay models and had students learn text structures and rhetorical devices used by the essay types. Learners in small groups planned and drafted out the essay in GD. Each group jointly constructed the essay by considering text structure and rhetorical devices they learned from the essay models. Each group followed the process of writing by going through peer review and editing process based on comments from peers and instructor and paid close attention to language structure, style, and essay content that conform to the type of genre. Then members in each group edited and proofread before publishing their co-authored essays in GD. The procedure of integration of process writing and genre-based approach is illustrated in Figure 2.3.

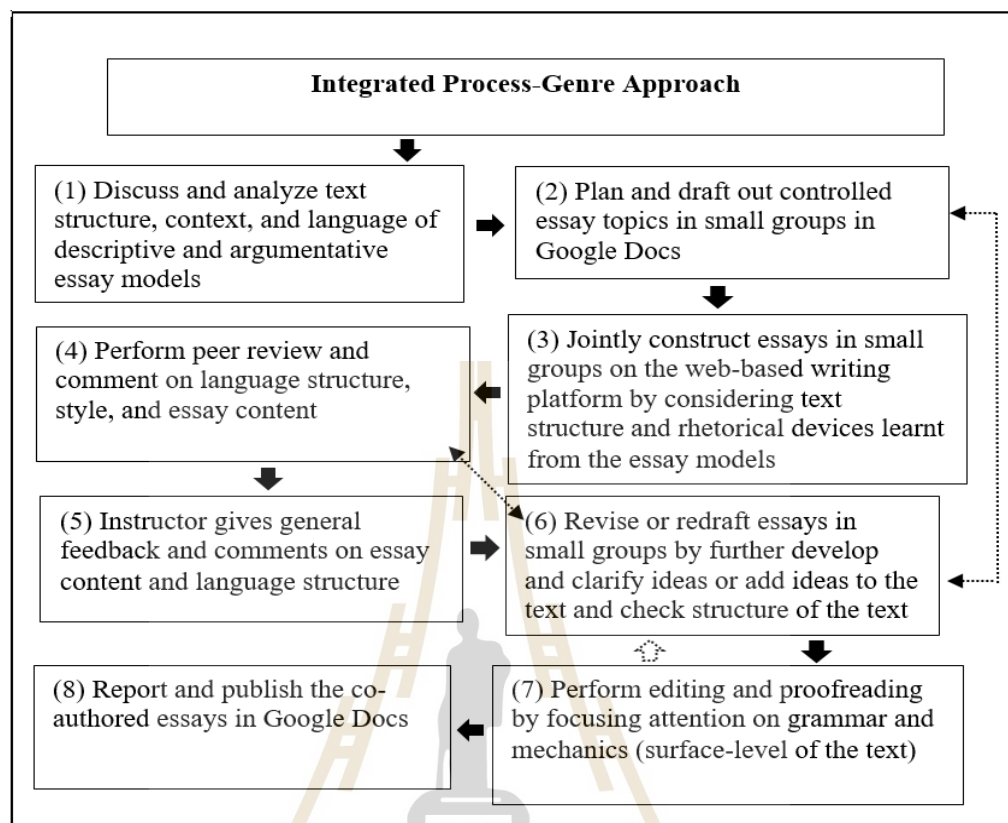


Figure 2.3 Integrated Process-Genre Approach in the Present Study

The application of integrated process-genre approach allowed learners to observe how texts were constructed based on their purposes. After the learners adequately learned the language structure, text organization, language use and rhetorical devices, they went through the writing process of multiple drafts before publishing the final version. On the one hand, a genre-based approach provided learners specific information in regards to language forms and styles or the lexical or syntactical features required by each writing genre (Rusinovci, 2015). Thus, the two integrated approaches are rather viewed as complementing each other throughout the entire process of writing rather than eliminating essential element of the other approach. As seen from Figure 2.3, integrated process-genre approach employed follows multiple steps, in which some stages are recursive that are marked with dotted line. For example, while learners revise their

group essay, they may move back to the draft stage if comments given by the instructor are critical which needs restructuring of the essay organization. Another example is when learners perform proofreading or editing process, they may get back to the revision stage to add more sources. The act of writing which integrates process-genre based approach can strengthen learners' writing skills as these two writing approaches complement each other throughout the recursive writing process.

Honing learners' writing skills needs to be underpinned by language learning theories. Likewise, this research attempting to explore learners' CW styles and interaction patterns using GD is driven by language learning theories. Therefore, the following section discusses learning theories underpinning collaborative learning, which is the focal point of this present study.

2.2 Learning Theories

Among other learning theories, this section presents two orientations that are social constructivism and sociocultural theory. These orientations believed to underpin collaborative learning activities, which will be further investigated in this research.

2.2.1 Social Constructivism

Over the past 30 years, Vygotsky's theory has since been extended largely in the field of psychology, child development, education, as well as linguistics and second language acquisition (SLA) (Mahn, 2013; van Lier, 2004). Vygotsky perceived cognitive development mainly comes from external factors such as cultural, social interaction, or collaboration with others rather than being of internal construction or personal development (Amineh & Asl, 2015; Patang, Machmoed, and Nasmilah, 2020). Vygotsky believed that individuals' cognitive development occurs when they are engaged in social interaction. In other words, cognitive growth first occurs on the social level and then transits to individuals (Amineh & Asl, 2015; Chen, 2019; Patang et al., 2020; Zhang & Lin, 2018) or cognitive development is established through social learning and interaction before passing on to individuals. Roth (2000) asserted that individual knowledge is derived

from their interactions with the surrounding environment and other people around them prior to absorbing new knowledge. This is due to the belief of social constructivists that human development is socially built and knowledge is created through interaction with other people (Fani & Ghaemi, 2011; McKinley, 2015; Vasodavan et al., 2020).

According to the theory of social constructivism, individual learners can master their conduct through psychological tools in which language is introduced as a significant element to measure cognitive growth. Although Vygotsky did not apparently explain or write about SLA, he offered a preliminary concept or a methodological approach that helps guide research into this discipline. This is evident, particularly relating to mental mechanisms where the relationship between thinking and the process of acquiring a language through social interaction is investigated (Mahn, 2013). A plethora of studies have since been extended from Vygotsky's notion on second language development, and researchers in SLA and applied linguistics over the last two decades have expanded his preliminary concepts to guide their investigations into facets of second language learning and development (Mahn, 2013). Vygotsky claimed that young learners acquire a second language consciously and intentionally through social interaction, unlike the process by which they learn their native language in where they do it without conscious awareness (Colliver & Veraksa, 2019; Mahn, 2013). Thus, knowledge of second language acquisition is socially and culturally created and meaningful learning takes place when learners are actively involved in social activities (Colliver & Veraksa, 2019; Kim, 2001; McKinley, 2015; Patang et al., 2020). An illustration of an instructional strategy grounded in social constructivism of how learners socially construct knowledge is when they learn through computer-mediated collaborative learning. This instructional strategy provides learners opportunities to practice and acquire the 21st century skills necessary for academic achievement (e.g., critical thinking, creativity, collaboration, communication, technology literacy, information literacy, and social skills). Through computer-mediated communication (CMC) tools, "meaning and understanding are forged out of an agreement between social partners which is honed by social interaction" (Pritchard & Woollard, 2010, p. 9). Thus, social constructivist theorists posit that individual learners can build up

knowledge and understanding when they positively interact with one another and with the surroundings they live in (Amineh & Asl, 2015; Colliver & Veraksa, 2019; Thienthong, 2016), either at school or outside classroom settings. Social support and social interaction are crucial elements that drive learners to cognitive development through their learning process. This notion is known as sociocultural theory, which builds on Vygotsky's social constructivism learning theory. Sociocultural theory posits that our cognitive functioning is radically a mediated process regulated by cultural artifacts such as language use and engagement in social activities. More of sociocultural perspective is further discussed as follows.

2.2.2 Sociocultural Theory

The sociocultural theory posits that our cognitive process is primarily a mediated process that is regulated by cultural artifacts, social activities, cultural beliefs, or attitudes (Ratner, 2002). Learning and developmental processes, therefore, take place through active involvement in cultural or social activities, language drills with peers, or interacting with family members at home, discussing assignments or work in institutional contexts like schooling and workplaces (Lantolf & Thorne, 2007; Moradian, Miri, and Alamdar, 2021). Focusing on the roles of language learning environment and language development, sociocultural theory informs extensive research on collaboration for the last two decades, in particular CW (Caplan & Farling, 2017; Bhowmik, Hilman, & Roy, 2018; Dobao, 2012; Donato, 2004; Kessler, Bikowski, & Boggs, 2012; Li, 2014; Li & Kim, 2016; Storch 2002, 2011, 2013; Zhang, 2018). The sociocultural theory claims that learning activity becomes more dynamic and interactive, and learning and development occur through collaboration and interaction among learners. In CW, learners can develop better ideas and organization of ideas, as well as linguistic aspects through peer feedback (Alghasab, Hardman, & Handley, 2019; Vorobel & Kim, 2017; Zhang & Hyland, 2018) when team members pool linguistic resources and share with each other. Learning through CW can increase the quality of text when learners perform difficult tasks (Liu et. al., 2018). In view of sociocultural theory human cognitive activity develops through interaction and collaboration within social and material environments in which language becomes “the most pervasive and powerful

cultural artifact that humans possess to mediate their connection to the world, to each other, and to themselves” (Lantolf & Thorne, 2007, p. 201). Language is a psychological tool to accomplish tasks that require higher-order thinking skills or when dealing with problem-solving skills (Woolfolk, 2016). More advanced thinking that leads to cognitive development involves other people or teachers in what Vygotsky terms it, “mediation”.

Mediation

To better understand the notion of “psychological mediation” via conceptual and semiotic tools, we can think of the relationship between humans and the physical world (concrete materials) they deal with (Lantolf & Thorne, 2007). If we want to trim the grass along the sidewalk to our backyard, it is possible to use old-fashioned scissors. However, a modern grass-trimming machine can be a more effective tool to hasten and lighten the work. Physical tools permit us to change the world in ways we find more practical and help transform our social and material environment so that we can change ourselves and adapt to the world we live in (Lantolf & Thorne, 2007). Likewise, learning is mediated via language and other social elements humans created. These developed tools (e.g., language, signs, scripts, numbers, music, arts, and other tools) influence our thought (Vygotsky, 1978), and they are regarded as internal orientation devices that control our mentality urging action (Iba & Yoshikawa, 2016). Thus, mediation occurs when individuals interact with other people around them; similarly, learning experience ensues when learners interact with peers or teachers, or other social environments (Ngo, 2018).

One form of mediation proposed by Vygotsky is “regulation”. The concept of regulation can be viewed as children starting to learn a language, in which they subordinate their behaviour to adult speech and acquire the language used by more capable peers or adults. Through observation, they gradually utilize the language to regulate their own behaviour by participating in social activities (mental and physical) initially regulated by others (Lantolf & Thorne, 2007). The process of developing self-regulation requires three stages:

a) object-regulation (using objects to regulate mental activity since children often use objects in their learning environment to formulate thoughts).

b) other regulation (involving varied levels of assistance, reinforcement, guidance and support).

c) self-regulation (the ability to accomplish tasks with minimal or no external assistance) (Lantolf & Thorne, 2007).

To view the concept of mediation through the lens of second language learning, we may think of how we can use language to regulate our mental functioning. We can formulate this through our mental activity called “private speech”. Vygotsky argued that private speech is “the case of social speech between people, who have a great deal of shared knowledge, need not be fully syntactic in its form” (Lantolf & Thorne, 2007, p. 202). Private speech occurs particularly when language learners encounter a difficult task, so they produce vocal expression to help them reanalyze the task for improving comprehension. The utterances produced by language learners are for themselves to reaffirm the information. Therefore, the operation of mental activities in which language becomes a psychological function is called “internalization,” which is discussed as follows.

Internalization

Internalization refers to the process where learners learn and absorb the knowledge and language rules from the social environment rather than through being physically taught. Through the process of internalization, learners possess “two different mechanisms of information processing in their mental activity; non-verbal thinking and conventional language and these two become united within a new mental structure.” (Toomela, 1996, p. 286). Internalization, therefore, explains “the organic connection between social communication and mental activity through which we gain control over our brains” (Yoroshevsky, 1989, as cited in Lantolf & Thorne, 2007, p. 203) and our mental function will manipulate what is being accumulated for future performance. The other mechanism involved in the learning process and language development is imitation. It is discussed as follows.

Imitation

Imitation in the sociocultural perspective as proposed by Vygotsky, is not merely perceived as mindless mimicking on others, but it involves a goal-directed mental activity

that can somehow transform the ordinary form or model. Vygotsky affirmed that “development based on collaboration and imitation is the source of all the specifically human characteristics developed in the child” (Lantolf & Thorne, 2007, p.203). From a psycholinguistic point of view, young learners do not learn words and then put them into sentences as defined in syntactic rules, but they learn concurrently from adults’ utterances and produce their own utterances to express their communicative purpose (Tomasello, 2003). Learning from adults’ utterances or from experienced partners occasionally comes in the form of imitation. However, the imitative process may not occur instantly after the utterances absorbed by the young learners in their linguistic environment, but rather evolves with a delay of days or weeks, or months later (Meltzoff, 2002, as cited in Lantolf & Thorne, 2007). For this reason, young and less experienced language learners need to maximize their learning potential through receiving proper guidance (Ngo, 2018) to reach the zone of proximal development (ZPD) as proposed by Vygotsky in his early work. The notion of ZPD is explained in the following.

The Zone of Proximal Development (ZPD)

Vygotsky firmly believed in the role of social interaction and significant others in learning development, so he proposed a concept of the ZPD, which has become a sound and practical framework in developmental psychology, applied linguistics, and education. The notion of ZPD gives rise to the understanding of the potential contributions of group activities or collaborative learning (Chaiklin, 2003; Doolittle, 1997; Lantolf & Thorne, 2007; Poehner & Infante, 2019). The ZPD is defined as:

“the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p.86).

From Vygotsky’s notion of ZPD, we can infer that an individual’s cognitive development is enhanced through assistance and scaffolding provided by more capable peers or more knowledgeable adults. He believed that individual intellectual development and the process of knowledge discovery are bound to personal experiences

and are interceded through social interaction with peers and people in a social context (Chaiklin, 2003; Dlab, Boticki, Hoic-Bozic, & Looi, 2020; Jones & Brader-Araje, 2002; Moradian et al., 2021; Poehner & Infante, 2019). From the concept of ZPD, the individuals' immediate potentiality for cognitive development may be limited on the lower end by which they can achieve on their own. Through positive interactions and support from more capable peers or teachers, individual learners will develop their mental ability at the higher levels, such as the ability to think more critically, the ability to improve problem-solving skills, or finding a useful technique to memorize things or learning a language in a more productive way. Thus, the concept of ZPD as a driving force has developed that addresses cognitive development and the process of how humans acquire knowledge. Vygotsky (1987) claimed that "what the child is able to do in collaborative today [he or she] will be able to do independently in the future" (p.211). Likewise, teaching language learners, the teacher needs to ensure the lesson is within their range of potential ability before they can move up to a higher step (Iba & Yoshikawa, 2016). Figure 2.4 illustrates the compelling nature of ZPD in the learning process proposed by Vygotsky (1978).

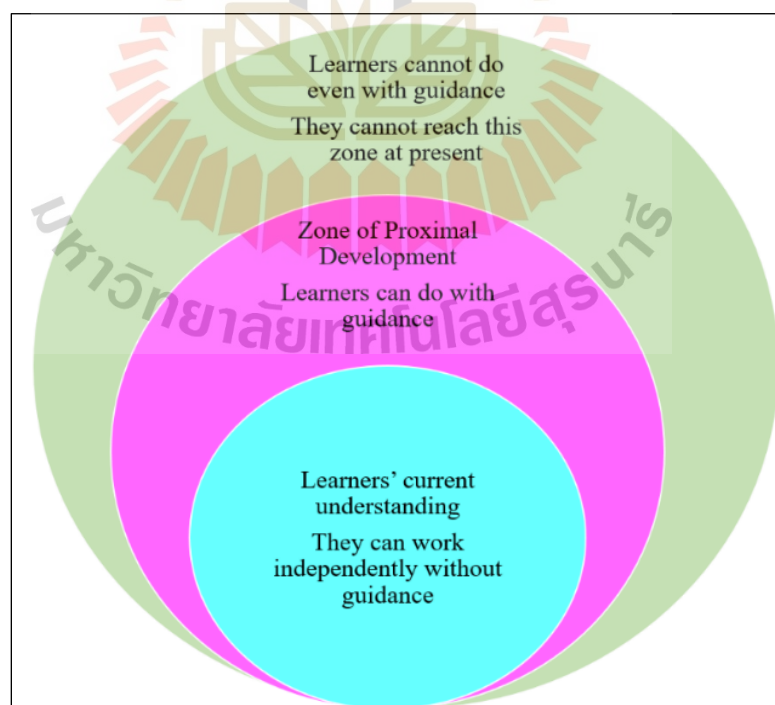


Figure 2.4 Vygotsky's Zone of Proximal Development (1978)

The notion of Vygotsky's ZPD can be described utilizing different viewpoints. At least three main aspects are discussed by researchers in the discipline: generality assumption (the concept of ZPD can be applied in various disciplines or subjects of study); assistance assumption (the learning process needs intervention by capable peers, adults, or teachers); and potential assumption (learners have the potential and readiness to achieve a greater level of performance if they are properly guided by competent peers or adults) (Chaiklin, 2003; Fani & Ghaemi, 2011; Lantolf & Thorne, 2007; Moradian et al., 2021).

The first aspect views that learners as capable of being able to carry out a task on their own, but they can do better or achieve a greater level of proficiency if they collaborate with partners that are more knowledgeable. Vygotsky's significant finding from his early work was that learning collaboratively with more competent peers, particularly in instructional settings, shapes cognitive development (Iba & Yoshikawa, 2016; Lantolf & Thorne, 2007; Zhang & Lin, 2018). The second aspect focuses more on the assistance or support provided by competent peers, experienced adults or teachers. When learners are assisted with appropriate instructional guidance and become fully engaged in the learning process, they can achieve a difficult task that they might not accomplish on their own (Ma, 2020). The last aspect emphasizes the hidden potential that learners possess but need a stimulus to achieve. Each learner's potentiality can be reinforced to reach a higher level if the target is properly identified (Chaiklin, 2003; Kuiper et al., 2017). Although learners may not be able to perform the task at present despite receiving assistance, they may slowly learn to develop skills and accomplish difficult tasks in the near future if the more competent others allow them to take steering control over the task (Baucal, 2013; Krahenbuhl, 2016). Therefore, ZPD is regarded as a developmental process in learning a language and it helps educators or language teachers to better perceive learners' emerging potentiality so that learners can be guided more efficaciously to their optimal capacities and continuing development through scaffolding strategies.

Scaffolding

The notion of scaffolding derived from the earlier work of Vygotsky (1978, 1987) who posited that learning occurs when children interact with their social environment,

particularly when they engage with more capable peers or more experienced others (Wilson & Devereux, 2014). In academic settings, scaffolding is a crucial element to support learners to make gradual progress from one step after another along their learning continuum. To some scholars (e.g., Mahan, 2020; Lin et al., 2012; Pritchard & Woollard, 2010; Van Lier, 2004), scaffolding is a means of assistance granted by a supporter who has the potential knowledge to provide substances or things which can assist in the process of acquiring knowledge and enhancing the learning experience. We may grasp the concept of scaffolding through analogy of constructing a building when scaffolds are deployed temporarily at construction sites to support the work of the crew when they function above the ground level. Without scaffolds, working above ground level would be impossible for the crew. Likewise, learners need scaffolding to enable them to move forward and step beyond of their current abilities. Van Lier (2004) marked six features of scaffolding:

- 1) contextual support – accepting errors as part of the learning process
- 2) contingency – providing supporting depending on partner's reaction
- 3) continuity – repeating the same action over time
- 4) flow – allowing communication flows in a natural way
- 5) handover – encouraging partners to take control when they accumulate skills
- 6) intersubjectivity – showing mutual engagement and support

Therefore, in acquiring knowledge, teachers and more capable peers act as scaffolders to assist less achievers to attain higher levels of knowledge development just like scaffolding constructed at a construction site makes the work secure and accessible (Pritchard & Woollard, 2010). Once learners show sign of progress on their own, scaffolding can be removed, otherwise it can become counterproductive rather than making a positive impact (Verenikina, 2003). Thus, scaffolding is perceived to be “a form of support for the development and learning of young learners” (Rasmussen, 2001, p.570) in knowledge building with the assistance of teachers or peers who provide essential tools to enhance the learning experience (Huang, 2019; Mahan, 2020). According to Pritchard and Woollard (2010), teachers may play different roles in scaffolding their learners, for example, “teacher

as support, teacher as prompt (using questions to redirect learners' thinking), teacher as critical listener and provider of feedback or teacher as motivator" (p. 40).

To sum up, the conception of scaffolding of learning is motivated by sociocultural theory, and learners can enhance their knowledge through support from teachers, experienced adults, and peers that are more knowledgeable. For this reason, collaborative learning activities become an effective pedagogical approach to escalate scaffolding in the language classroom. From this viewpoint, knowledge is considered to emerge and to be enhanced through social interaction and support from teachers or more knowledgeable peers.

The two learning theories: social constructivism and sociocultural theory are perceived to underpin collaborative learning activities employed in the present study. These two orientations share a remarkably similar notion; both theories give importance to the construction of knowledge through collaboration with others. However, sociocultural theory puts focus on the mediating role of historically situated cultural tools and artefacts (Cole & Wetsch, 1996). Therefore, the researcher placed an emphasis on the sociocultural theory as it underpins the nature of the present study. The following section outlines how the theory is applied in the current study.

2.2.3 Application of Sociocultural Learning Theory in Teaching L2 Writing

With a rapid increase of interest in contemporary educational discourse in so-called "student-centered education", educators worldwide are increasingly propelled to admit that sociocultural pedagogy is a driving force to facilitate learners to discover a meaningful learning experience. The process of learning and knowledge acquisition occurs through individual knowledge construction or social interaction among learners (Alghasab, Hardman & Handley, 2019; Krahenbuhl, 2016). The concept of sociocultural theory initiated by Vygotsky has been widely used as a theoretical framework for EFL academic writing (Alghasab et al., 2019; Chen 2020; Mckinley, 2015), case-writing for an integrated curriculum (Doubleday et al., 2015), collective scaffolding in wiki-based small group writing (Li, 2013), small group interaction in wiki-based CW in the EAP context (Li, 2014; Li & Kim, 2016), peer CW in the EAP classroom (Bhowmik, Hilman, & Roy, 2018), and peer interaction

in the EFL classroom (Chen, 2020). These are some of the works where researchers have employed sociocultural theory to foster L2 learners to enhance their writing proficiency through collaborative work with the use of computer-supported collaborative learning.

It is obvious that the notion of sociocultural perspective fully supports collaborative learning. In other words, collaborative learning is grounded in sociocultural learning theory, which posits that learning process should be connected with meaningful social interactions in which language is a medium for reciprocal action (Abrams, 2019; Jeong, 2016). In this manner, learners utilize opportunities to interact and negotiate ideas with others in discussion to construct knowledge. Language, therefore, plays a vital role in interactions for it permits learners to plan, coordinate, resolve problems, and co-construct ideas that lead to knowledge construction during their interactions (Chen, 2020; Li & Kim, 2016; Li & Zhu, 2017) in order to accomplish the task at hand. Appropriate and meaningful social interactions lead to meaningful learning and collective knowledge construction. This is because collaborative interactions and mutual engagement in an activity can stimulate the function of ZPD when proper guidance and assistance are adequately provided by more competent members (Jeong, 2016; Maxson et al., 2019). Collaborative learning, therefore, echoes its potential benefits in a number of ways. For example, a more correct use of language is achieved in CW compared to learners writing individually and texts jointly produced by members in CW class tend to be linguistically more accurate than texts produced by a single writer (Dobao, 2014; Limbu & Markauskaite, 2015; Talib & Cheung, 2017; Wigglesworth & Storch, 2009; Woodrich & Fan, 2017).

As we can see sociocultural theory of learning, that originated by Vygotsky with his universal notion of ZPD proposed over 40 years ago, is still serving as a core guiding principle for educationists and researchers in the academic discipline who believe that a collaborative effort is a driving force of greater knowledge than individual attempts. The underlying concept of ZPD noticeably serves as a theoretical foundation for implementing collaborative work, particularly CW activities. The present study aims to investigate this idea by using GD to examine the effects of CW tasks on learners' writing performance and

interactions among small groups in a multilingual English learners classroom while they jointly produce descriptive and argumentative essays.

Previous studies carried out by various researchers (e.g., Alghasab et al., 2019; Chen, 2020; Dobao, 2012, 2014; Li & Kim, 2016; Liu et al., 2018; Moradian et al., 2021) have employed sociocultural learning theory to implement group work in CW activities. These researchers mutually agreed upon the positive effects of social interactions and collective knowledge construction that led to a better quality of text. Group work stimulates learners to pool their linguistic resources, their preconceived knowledge, and consult each other when encountering difficulties (Begum, 2016; McDonough et. al., 2018; Qiu & Lee, 2020). Thus, informed by a sociocultural perspective, ideas can be expanded, and language skills can be enhanced through active participation in group discussion. Figure 2.5 illustrates the function of sociocultural learning theory in a CW classroom.

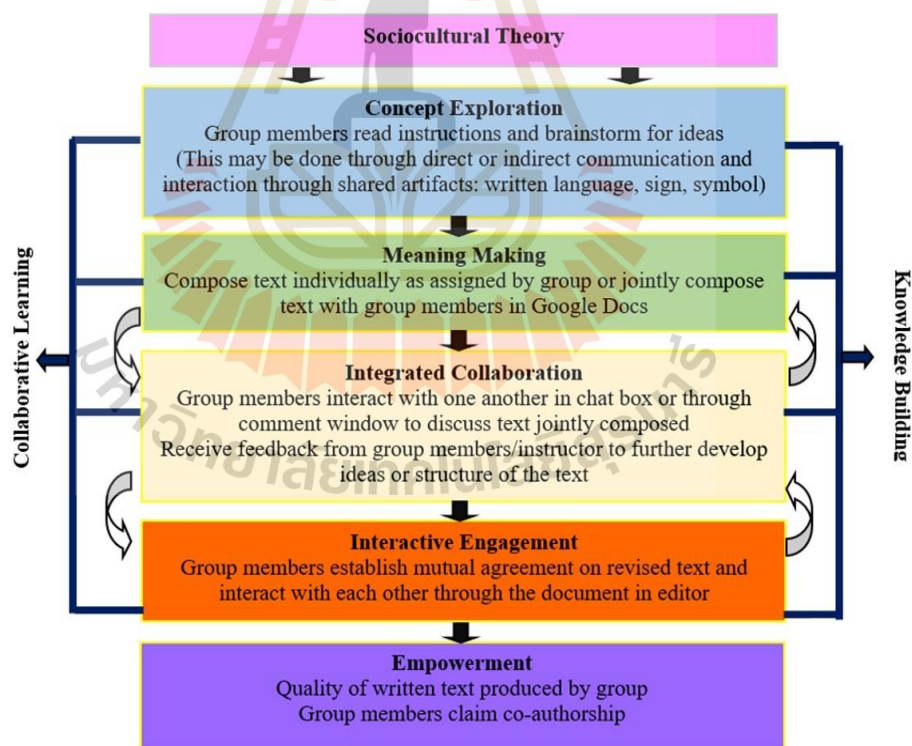


Figure 2.5 Modification of Hsieh, Wu, and Jou's Theoretical Framework of Intercultural Collaboration (2007, p.2)

We can claim that CW activity, facilitated through computer-supported tools is strongly underpinned by sociocultural theory in which learners are actively engaged in knowledge construction. Along the collaborative learning process, learning occurs as individual learners support each other to co-construct knowledge through social interaction and negotiation to accomplish group tasks (Bhowmik, Hilman, & Roy, 2018; McDonough et al., 2018). In the foreground of the online collaborative writing (OCW) process, writers interact with one another using different modes such as chat box, comment window, synchronous or asynchronous communications. These processes of social interactions are to support the development of a common understanding that is the crucial element of negotiated meaning making to improve the quality of the task (Andrew, 2019; Brodahl & Hansen, 2014; Chen, 2020; Wu & Schunn, 2020). Therefore, collaborative groups can produce stronger, better, and longer source-based essays when the group members collectively draw on their strengths to accomplish the shared work (Krishnan et al., 2018). Learners in an OCW group can employ more lexical variation as well as syntactic complexity and display significant improvement in L2 writing accuracy than those not participating in groups (Bailey & Judd, 2018). This reflects Vygotsky's notion of ZPD. To some extent, learners can do without guidance from more knowledgeable peers, but collectively they can achieve a superior result.

To sum up, CW activities promote collaboration and positive interaction among learners and propel them to co-construct knowledge to deepen their understanding of the subject matter they are searching. To inculcate learners to co-construct texts more effectively in small groups requires some strategies. These CW strategies are discussed in the following section.

2.3 Collaborative Writing Strategies

Collaborative writing (CW) is considered a crucial writing act and social process that involves a team striving to accomplish a common goal while engaging in negotiation, coordination, and communication during the process of the creation of a shared document (Lowry, Curtis, & Lowry, 2004; Nykopp, Marttunen, & Erkens, 2019; Zhang, 2018). The

significance of CW is likely to continue expanding into the near future, especially in the academic and business world, due to the increasing globalization as well as the 24-hour accessibility to the Internet that provides opportunities for collaboration. The definition of CW is broad as given by various disciplines since many fields can study CW from a holistic point of view. However, Lowry et al. (2004) clarified that the most common CW strategies can be characterized as “group single-author writing, sequential single writing, parallel writing, horizontal-division writing and stratified-division writing (mixed mode writing), and reactive writing,” (p. 74). The following subsections illustrate various types of CW strategy proposed by Lowry et al. (2004).

2.3.1 Group Single-Author Writing

Group single-author writing occurs when a member of the group is assigned to write for his entire team. This strategy is generally used when the CW task is simple enough and the task is not particularly significant to the members. The group single-author writing style is displayed in Figure 2.6.

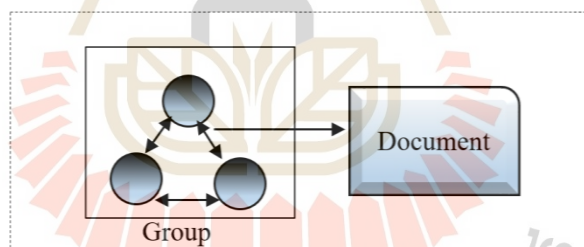


Figure 2.6 Group Single-Author Writing Diagram (Lowry et al., 2004, p.76)

2.3.2 Sequential Writing

This form of CW occurs when a person writes at an allocated time; each member in the group completes their turn and passes it on to the next member. The advantages of sequential writing strategy include the simplified organization of writing structure as well as improved coordination for the shared work. However, some disadvantages do exist when using this type of CW strategy. For example, sequential writing

can create a lack of group consensus due to string variations of thoughts or ideas placed together without proper revision. The sequential writing strategy is illustrated in Figure 2.7.

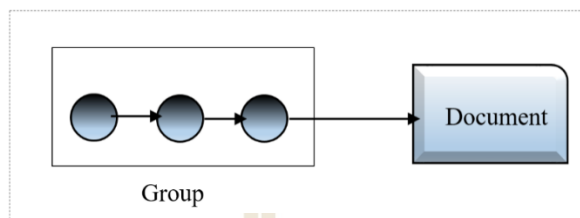


Figure 2.7 Sequential Writing Diagram (Lowry et al., 2004, p. 76)

2.3.3 Parallel Writing

Parallel writing strategy normally occurs when group members divide CW work into different units and work in parallel (Lowry et al., 2004). This CW type is also referred to as a separate writer strategy (Posner & Baecker, 1992) or a partitioned writing strategy (Ellis, Gipps, & Rein, 1991). The benefits of this CW strategy include working autonomously and with anonymity for interaction is via technological tools. In contrast, the downsides of this strategy involve poor communication, oblivious authors (Ellis et al., 1991), different styles of writing, and information overload (Lowry et al., 2004). The parallel writing strategy is displayed in Figure 2.8

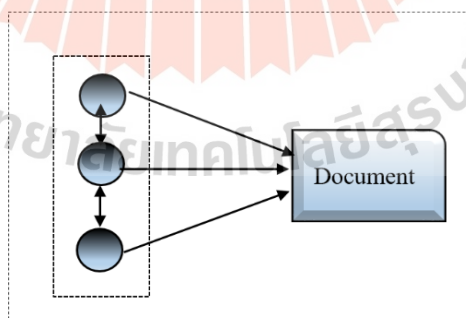


Figure 2.8 Parallel Writing Diagram (Lowry et al., 2004, p. 77).

2.3.4 Horizontal-Division Writing

Horizontal-division writing is derived from parallel writing. It is perceived to be the most common form of parallel writing in which individual members are responsible

for a specified section of the shared task. The major disadvantage of this CW strategy is the divisions of work are often discretionary and are not based on individual member's core competencies that contribute to a better quality of the end project. The horizontal-division writing strategy is demonstrated in Figure 2.9.

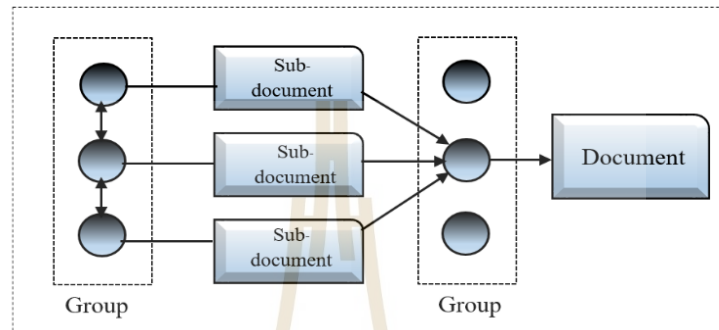


Figure 2.9 Horizontal-Division Writing Diagram (Lowry et al., 2004, p. 78).

2.3.5 Stratified-Division Writing

Stratified-division writing is another form of parallel writing in which each member plays a distinctive role in the writing team. An author conveys thoughts and ideas into the text, records the text, and makes changes to the writing; a consultant contributes at different stages of the writing project but they may not write the text; an editor helps evaluate and edit the written text; and a reviewer gives feedbacks and comments on the written text (Baecker et al., 1993). The role of an individual member is assigned based on their core competencies. Stratified-division writing is shown in Figure 2.10.

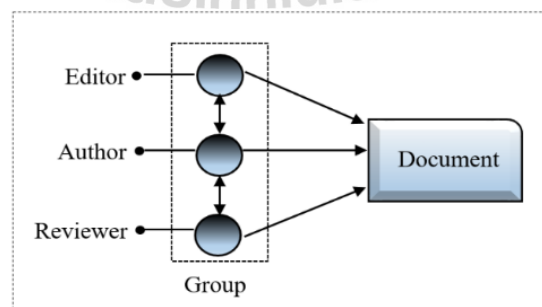


Figure 2.10 Stratified-Division Writing Diagram (Lowry et al., 2004, p. 79)

2.3.6 Reactive Writing

A reactive writing strategy often occurs when group members compose writing tasks synchronously or in real-time with the assistance of the computer-mediated tool. They may react and comment on each other's input or even change or add to other members' work (Lowry et al., 2004). This CW strategy is also known as joint writing (Posner & Baecker, 1992), reflective writing or consensus writing (Ellis et al., 1991). However, the term *reactive writing* is used by researchers (e.g., Lowry et al., 2004), due to the notion that reaction that may engage “the consensus or dispute, reflection, or off-the-cuff contributions” (p.78). The reactive writing strategy is depicted in Figure 2.11.

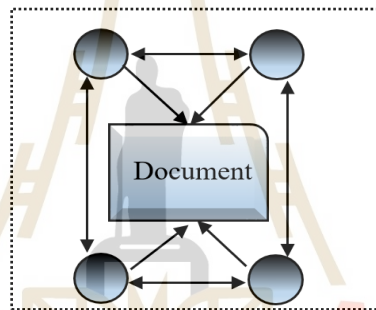


Figure 2.11 Reactive Writing Diagram (Lowry et al., 2004, p. 80)

These major types of CW strategies are employed by collaborators while engaging in a writing task. Writers with different background knowledge or education or from a distinct academic discipline may employ different types of CW strategies. This depends on the nature of task, the formation of group, the activeness of individual members, and the CW modes including online or face-to-face collaboration. Table 2.2 summarizes the major types of CW strategies that was discussed previously.

Table 2.2 Summary of Collaborative Writing Strategies
(Adopted from Lowry et al., 2004, p. 81)

<i>Writing Strategy</i>	<i>When to Use</i>	<i>Pros</i>	<i>Cons</i>
Single-author writing	When little buy-in is needed; for simple tasks, such as meeting notes and agendas; groups are small.	Efficient and style consistency.	May not clearly represent the group's intentions and less consensus produced.
Sequential single writing	Asynchronous work with poor structure and coordination; when it is difficult to meet often; for straightforward writing tasks; small groups.	Easy to organize and simplify planning.	Lose sense of group, subsequent writers may invalidate previous work, lack consensus, version control problems, inefficient, and one-person bottlenecks.
Parallel writing-horizontal division	High volume of rapid input is needed; software capable of supporting this strategy is available; a mildly complex writing task in easily segmented; distributed groups have good structure and coordination; groups are small to large.	Efficient and high volume of output	Writers can be blind to each other's work; redundant work can be produced if poorly planned, stylistic differences, potential information-overloaded, and does not recognize individual talent differences well.
Parallel writing-stratification	When a high volume of rapid input is needed; have software capable of supporting this strategy; writing a task that is difficult to segment and fairly complicated; distributed groups with good structure and coordination; people have different talents that can be used; groups are small to large.	Efficient, high volume of quality output, less redundancy, and better use of individual talent.	Writers can be blind to each other's work, redundant work can be produced if poorly planned, stylistic differences, potential information overloaded.
Reactive writing	When high levels of consensus on writing process and content are needed; need high levels of creativity; groups are small	Can build creativity and consensus	Extremely difficult to coordinate, problems with version control, and most software does not effectively support this strategy

As can be seen in Table 2.2, different major types of CW strategies come with advantages and disadvantages. To overcome obstacles and improve team collaboration

are essential in the CW classroom. Lowry et al. (2004) posited that an effective team needs to build trust and interdependence, negotiate and support each other, value other's contribution, have a positive attitude toward the group work, and effectively communicate with one another during the creation of task and until the task is completed. Cultivating and implementing these necessary skills will guide learners in CW classrooms to enjoy a profound experience in group work and learn to value one's own and others' talents (Chen, 2019; Elabdali, 2021). This is because collaboration promotes unity in the group and eliminates the concept of competition. Thanks to modern technological tools that have made it possible to enhance collaboration, transform the nature of writing, and provide learners opportunities to delve into writing competences and language development in and out of classroom settings at their own pace. These CMC tools have permitted for collaboration in a broader scale. More details about CMC technologies and their roles in writing instruction in a collaborative classroom are discussed in the following section.

2.4 Computer-mediated Collaborative Writing

In this section, the notion of CMCW is addressed to reveal the research trends and paradigms in the field. As claimed by researchers (e.g., Ardiasih, Emzir, & Rasyid, 2019; Elabdali & Arnold, 2020; Krishnan et al., 2018; Liu et al., 2018; Storch, 2021; Weisberger, Grinshtain, & Blau, 2021; Yanguas, 2020; Yim et al., 2017), new technologies and web 2.0 development continue to play a significant role in supporting both individual and OCW. The OCW tools such as Wikis and GD have been consistently developed and currently these tools are used extensively in education (Alghasab et al., 2019; Ardiasih et al., 2019; Elabdali & Arnold, 2020; Liu et al., 2018; Nykopp et al., 2019; Vetter, McDowell, & Stewart, 2019; Williams & Beam, 2019). These invented computer-mediated forms of communication permit people of all ages to convey messages freely and exchange information in numerous areas (Teng, 2021; Thiemann, Hesse, & Kozlov, 2019; Wang, Fang, & Gu, 2020; Williams & Beam, 2019). The CMC tools empower writers in all disciplines to write collaboratively and they can share, edit, or evaluate each other's writing pieces

faster and more conveniently than ever before in human history (Li & Storch, 2017). A number of studies in CMC technologies have investigated the new ways of online collaboration in Wikis (e.g., Alghasab et al., 2019; Ardiasih et al., 2019; Elabdali & Arnold, 2020; Hosseini et al., 2020; Kioumarsis et al., 2018; Li, 2014; Li & Kim, 2016; Vetter, McDowell, & Stewart, 2019) and in Google Docs (e.g., Hsu, 2020; Ishtaiwa & Aburezeq, 2015; Krishnan et al., 2018; Lee & Hassell, 2021; Nykopp et al., 2019; Steinberger, 2017; Woodrich & Fan, 2017). These studies addressed topics such as peer collaboration to develop L2 writing ability (Kioumarsis et al., 2018), collaborative practice and their impact on quality, quantity, and style of text production (Chen, 2019; Krishnan et al., 2018; Yim et al., 2017), and synchronous CW with technology (Cho, 2017; Steinberger, 2017). These CMC tools (e.g., blogs, Wikis, GD) become an important means to connect people within the community and wider community. Hyland (2016) posited that these CMC technologies have shared how people construct texts and how they create particular genres to convey messages or engage with target audience. With the rapid development of web 2.0 technologies and social software made available for education, it is unsurprising to see changes in the writing behaviour among writers. They are moving from self-directed work to be focused more on collaboration. This is because collaborative work yields benefit in text production (Ardiasih et al., 2019; Bhowmik, Hilman, & Roy, 2018; Caplan & Farling, 2017; Chen, 2019; Dobao, 2012, 2020; Elola, 2010; Krishnan et al., 2018; Li, 2013; Liu et al., 2018; McDonough & De Vleeschauwer, 2019; Wigglesworth & Storch, 2009). Also active collaboration has proven to bring a cognitive advantage and development (Alghasab et al., 2019; Hsu, 2020; Thiemann et al., 2019).

One of the effective WBCW tools to assist learners in either synchronous or asynchronous collaboration is GD. It is a free web-based tool officially introduced to public in 2009. GD is found to be highly attractive when group members plan to collaborate with each other online at a distant location. It is an exceptional application for online collaboration (Ishtaiwa & Aburezeq, 2015; Lee & Hassell, 2021). Further details about GD is discussed in the following subsection.

2.4.1 Google Docs

The collaborative tools such as GD or “web-based word processing tool” (Kessler, Bikowski, & Boggs, 2012) can facilitate CW and foster writing skills and development among L2 writers (Abrams, 2019; Ahmad, 2020; Lee & Hassell, 2021; Li & Storch, 2017). These new technologies permit learners to work on their writing simultaneously and their text can be shared with others for review, comments, and feedback, and they can improve the quality of work at their own pace. On account of the potential of these technological tools (e. g., Wikis, GD) and the existence of social networking sites for L2 writing pedagogy, researchers have shown growing interest in L2 learners’ CW through using WBCW tools (Abrams, 2019; Alharbi, 2020; Borowski et al., 2020; Thienmann et al., 2019; Williams & Beams, 2019). Their use can enhance writing skills as well as create a friendly atmosphere in writing.

GD is a free web-based tool offered by Google, and it was officially introduced to public in July 2009. It holds some significant features such as word processor, form, spreadsheet, blogs, presentation, and a form designer to support technology skills that students need in the 21st century (Alharbi, 2020; Ishtaiwa & Aburezeq, 2015; Suwantarathip & Wichadee, 2014). GD permits multiple collaborators to work and edit texts simultaneously in real time. Each user’s position is denoted by a specific color and cursor appeared on a shared document. Currently, GD incorporates four major options, namely Google Documents, Google Presentations, Google Drawing, and Google Spreadsheets, in which their functions are identical (Suwantarathip & Wichadee, 2014). The modules in GD facilitate students to complete their tasks without restrictions often imposed by traditional face-to-face interaction or in-person meeting (Krishnan et al., 2018; Warschauer et al., 2019).

Another remarkable aspect of GD is it records a revision history in that the team can revert to all track changes right from the start. In the revision history, different colors represent different contributors who share work or changes they make on others’ contributions. All changes can be tracked and automatically saved within 30 seconds in the revision history and recorded instantly in the server. They can be viewed and reverted

to if authors disapprove of a change or insist on keeping the previous version (Wang et al., 2015). GD provides a chat room that allows group members to communicate with each other directly on the shared document. The chat window is, however, available only when at least two members log into the GD file and start a discussion. All chat interactions are automatically recorded in the chat log and they can be reread during the group project. Such a phenomenon may raise the students' awareness with regard to their own writing and the writing of their peers and, therefore, provide chances of improving the quality of writing (Steinberger, 2017).

The other significant function of GD is it can handle both synchronous and asynchronous collaboration. In other words, multiple contributors working in the file can edit each other's work in real-time to edit or make further comments on the topic being discussed, a feature hindered in Wikis. Because of this unique feature, GD is suited for both synchronous and asynchronous CW projects and it enables collaboration in a much more effective way (Abrams, 2019; Borowski et al., 2020; Woodrich & Fan, 2017). Additionally, with the development of technologies and the trends in teaching and learning in the 21st century, it becomes crucial that educators or classroom teachers are aware of the ability to utilize a blended learning concept that combines a face-to-face classroom learning environment with an appropriate and creative use of technology (Lee & Hassel, 2021; Nykopp et al., 2019; Steinberger, 2017; Williams & Beam, 2019).

In a recent study carried out by Lee and Hassel (2021) on GD as a tool for CW, the researchers found that this application tool could benefit students who want to build language abilities in a friendly manner within a low-pressure environment. This free web-based tool is well suited for off-site collaborative assignments and it becomes a significant tool to enhance students' language learning through peer collaboration. GD is now available on Android and iOS mobile operating systems (Tabone, 2014) and such convenience fully facilitates collaborators to work anywhere at their own pace as long as Internet is accessible. Because GD offers this special feature to enhance learning, it becomes a powerful tool to support CW activities inside and outside the classroom setting more practically.

Since this study aims to examine the effects of CW on learners' writing performance and interactions, and small groups' CW patterns. The researcher sought to investigate the team members' CW behaviour in GD, how much each member contributed and who contributed in what area. However, GD does not have a feature to analyze CW behaviour or observe the "seismic activity" (Wang et al., 2015). Therefore, the use of data visualization tool that can display the "seismic activity" and visualize group members' CW behaviours along the writing process is needed to perform the analysis. One of the visualization tools developed recently by Dakuo Wang and his research team from the University of California, Irvine, called "DocuViz". This tool can analyze each group' CW behaviours more effectively through data visualization bar charts generated by the software. More details about DocuViz are elaborated in the following subsection.

2.4.2 Web-Based Collaborative Writing with DocuViz

Due to the rapid development of technologies, people have changed their ways of writing, and some particular features that support CW did not exist in the past (Wang, 2016; Wang et al., 2015). For this reason, some researchers might be interested in the new patterns of L2 learners' CW behaviour, with the assistance of CMC tools that may further enhance writing skills or strengthen the relationship among members through positive comments and support for each other. Due to the increasing interest in OCW with the full availability of web-based tools, the research team from the University of California, Irvine, developed "DocuViz" in which the system can display the entire revision history in GD (Wang et al., 2015; Krishnan et al., 2018; Yim et al., 2017). DocuViz can automatically create a visual history bar chart across different timelines, indicating the authors and the amount of work they contributed towards their group project. The tool detects all data entered in the GD file and it provides usage statistics related to collaborative revision behaviours of the collaborators, such as the amount of peer editing or the weight of the final draft each collaborator contributed (Krishnan et al., 2018; Olson et al., 2017; Yim et al., 2017). An overview of DocuViz is illustrated in Figures 2.12 and 2.13 based on the analytical data visualization charts developed by Wang et al. (2015) from their study.

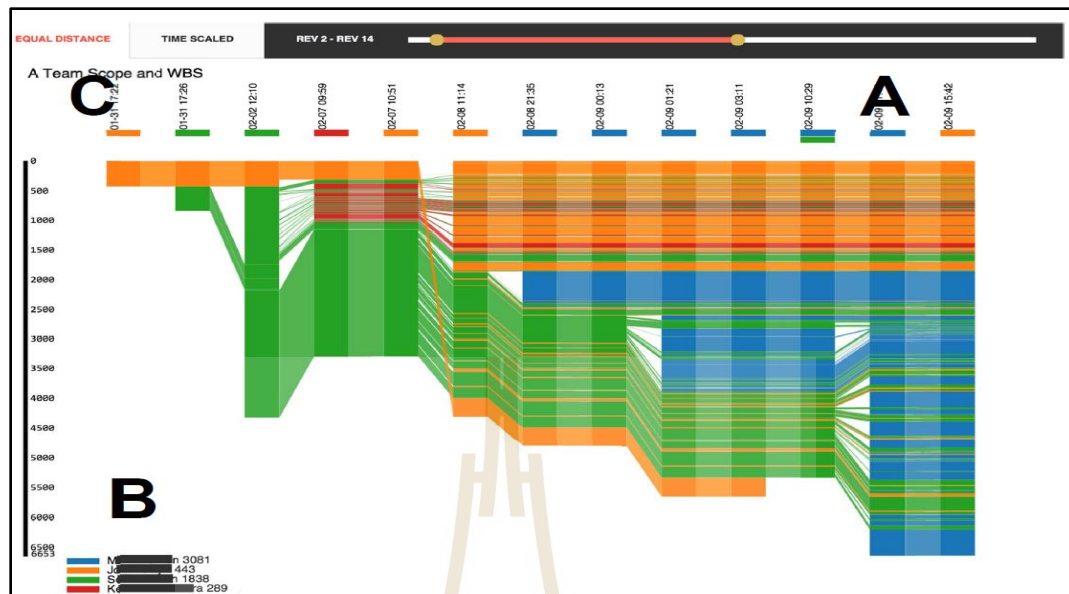


Figure 2.12 User View of DocuViz (Wang et al., 2015, p. 1867)

Each column with different colors represents the shared document while the members contributing at that particular time. This simply indicates a part of the revision history made by different contributors as their authorship is decoded by colors from each segment. The height of the vertical bar from each column indicates the amount of text contributed at that particular time, whereas the successive columns signify time shifting from left to right (Wang et al., 2015). The little rectangular bar displayed in different colors at the top of the columns, as shown in letter A, represents a timeline indicating who was in that 'slice' and whether that person did something or not at that particular time slot (Olson et al., 2017). The colored bars at the bottom as shown in letter B depict a compilation of the number of characters in the final version that were composed by each contributor (Wang et al., 2015). On the far left, character numbers are displayed vertically in descending order from smallest to largest numbers. In addition, the data visualization produced by DocuViz provides authors with preliminary data on how much they contributed. As seen in Figure 2.13, at the bottom of the chart the number of characters is segregated into four different columns: (1) the number of edits made to one's own writing, (2) the number of edits made to other contributor's writing, (3) the number of

edits made in total, and (4) the number of each author's contributions to the final version of the task (Krishnan et al., 2018).

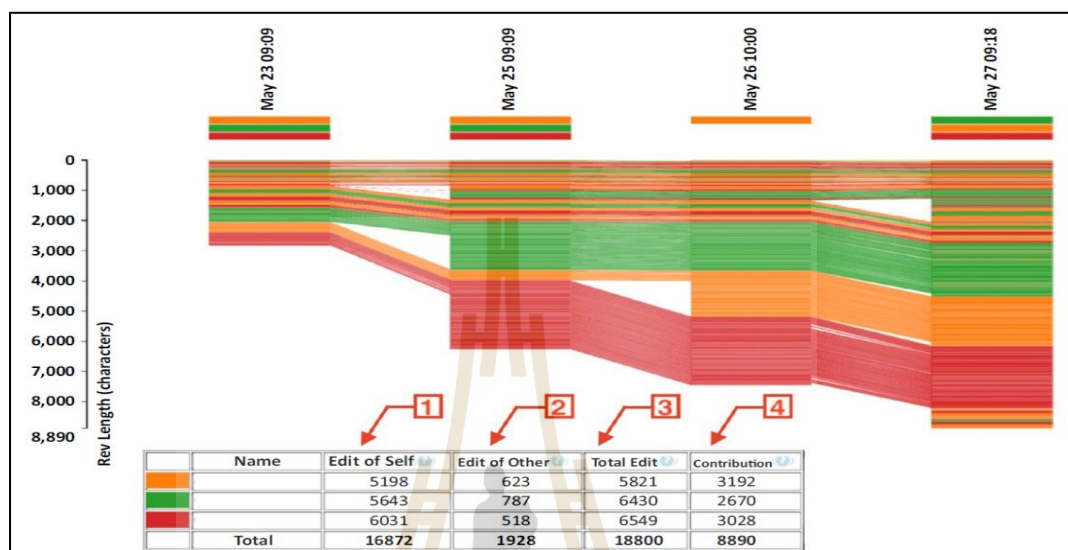


Figure 2.13 DocuViz: An Information Visualization Chart (Krishnan et al., 2018, p. 3)

DocuViz embedded in GD has created a stepping stone to enable writing teachers to visualize group interaction and contributions from members along the OCW process. The system can inform the teachers to support and raise students' awareness to contribute actively when they are collaborating online to accomplish the group task. Students can track or monitor their engagement in the group work and observe how much they contributed towards the final version. Such records will eradicate the free-rider problem and stimulate deeper learning as well as strengthen group relationships and support one another to optimize learning opportunities. DocuViz data visualizations provide a clearer understanding of L2 writing behaviour. The system can be used to boost learners to improve their writing skills (Olson et al., 2017), as a consequence of the seismic visualization which tracks changes or edits made by collaborators to the shared document over time (Wang et al., 2015; Warschauer et al., 2019). Some particular writing styles (e.g., equal contribution, outline/divide, cooperating in parallel, or conquer style) tend to be associated with higher quality document than those showing unequal contributions (Yim

et al., 2017). Since modern technology has made it possible to improve writing skills, this can be considered a good sign as technology becomes a primary facilitator in CW activities (Warschauer et al., 2019). To identify collaborative behaviours from learners' CW tasks generated by DocuViz, some patterns of collaborations are explained in the following.

Main Writer Style

In the main writer style, one or two members write most of the text or play a dominant role to control over the task, while the other peers contributed little (Yim et al., 2017). An example of the main writer style is shown in Figure 2.14.

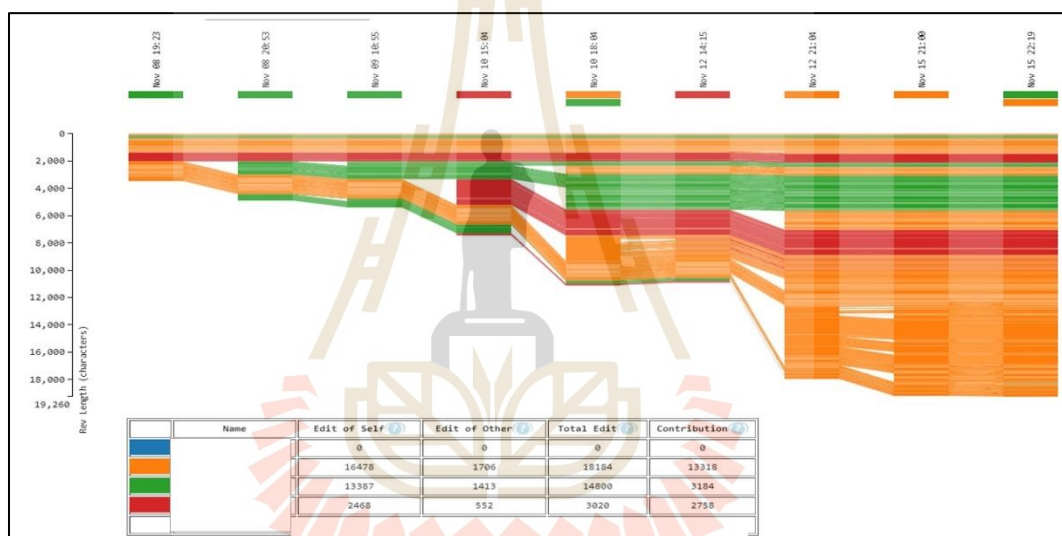


Figure 2.14 Main Writer Style

As shown in Figure 2.14, the member (the yellow color) wrote more texts than the other two when the team started their CW task on November 8 and ended on November 15.

Divide and Conquer Style

Another type of collaborative pattern is called “divide and conquer”. In the divide and conquer style, members compose their own section and do not edit each other's text. They only focus on their own writing and rarely engage with someone's work. An example of the divide and conquer style is illustrated in Figure 2.15.

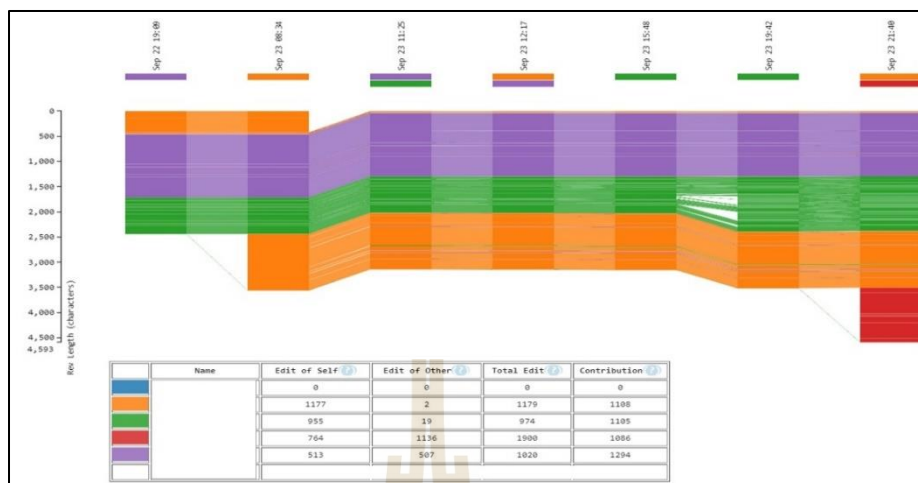


Figure 2.15 Divide and Conquer Style

As seen in Figure 2.15, members depicted in different colours focus on their own part and rarely involved with their peers' texts. The work is divided into a block style.

Cooperative Style

The other type of collaborative pattern is known as "cooperative". In this style, members divide their parts and occasionally edit or engage in other members' contributed texts, oftentimes at the final stage of writing (Yim et al., 2017). An example of the cooperative style is shown in Figure 2.16.

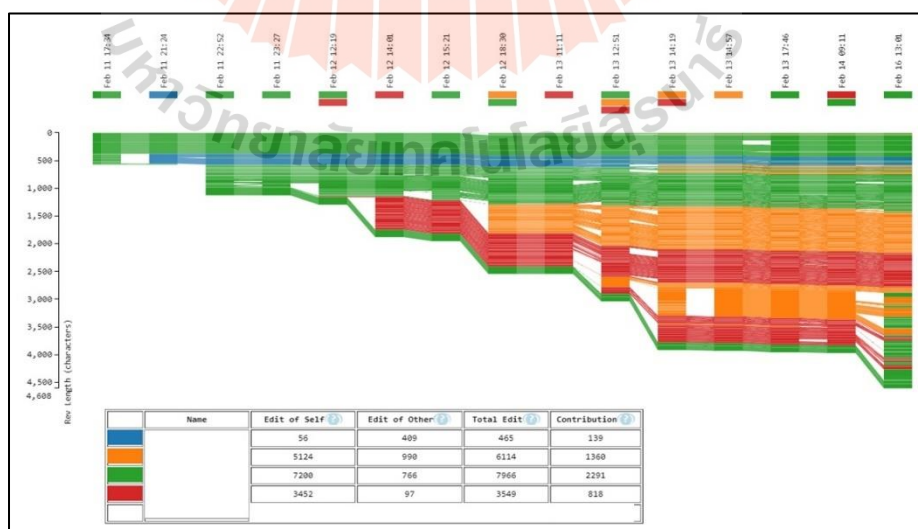


Figure 2.16 Cooperative Style

As shown in Figure 2.16, members occasionally engage in their peer's text. For example, near the final stage, the members revise their texts together as observed through the crossed colour bars indicating text intervention in descending order.

Collaborative Style

In the collaborative style, members make joint contribution in text co-construction. This CW style is also known as joint writing (Posner & Baecker, 1992) when the team members are willing to engage with other members' contributed texts. Oftentimes, members display equal degree of control over the task (Li, 2014). An example of the collaborative style is shown in Figure 2.17.

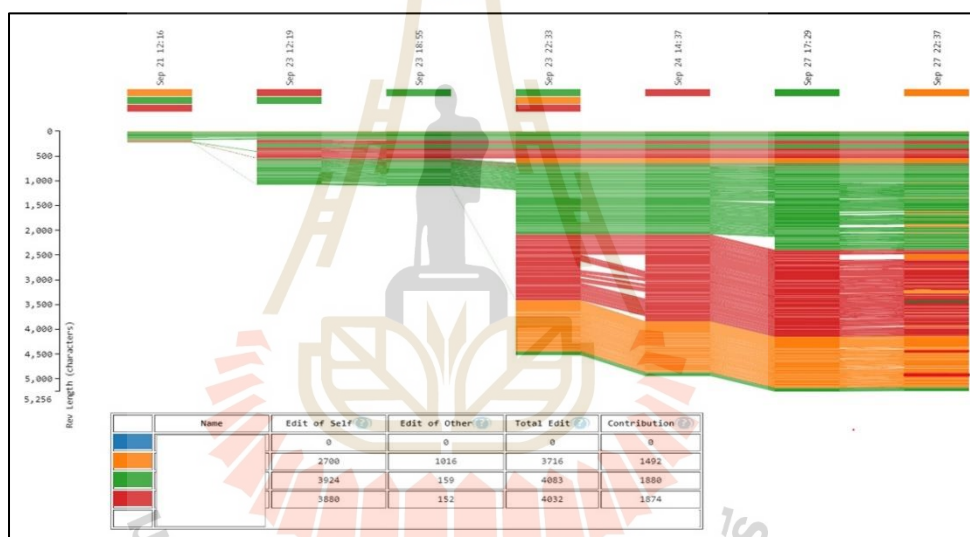


Figure 2.17 Collaborative Style

As seen in Figure 2.17, the members share nearly equal amount of text and they interact with each other's text by contributing ideas, revising or editing other's texts. Their collaborative efforts can be viewed through the crossed colour bars in descending order at the final stage of writing.

We can see that DocuViz, a text-mining tool works in a breathtaking way, in which the tool can generate data entered into a GD file by displaying a visual history chart across different time points (Yim, 2017). When this tool is incorporated in GD, it allows instructors to monitor learners' text revision behaviours, or members' writing behaviours.

The system informs how writers revise when they work together and potentially could reveal whether a particular revision pattern yields a higher quality of writing. These are distinct research interests. The following subsection discusses writing and revision behaviours that occur during the CW processes.

2.4.3 Writing/Revision Behaviours

The primary interest of the research trajectory in this area over the past years has been to examine writing/ revising behaviours in WBCW, such as Wikis and GD. Researchers have investigated L2 learners' writing revision types (e.g., Li, 2013, 2014; Li & Kim, 2016; Liang, 2010; Mak and Coniam, 2008) whereas some have focused on meaning changes (e.g., Kessler & Bikowski, 2010; Kessler, Bikowski, & Boggs, 2012), and others have examined both meaning and forms made after group revision (e.g., Arnold, Ducate, & Kost, 2012; Razak & Saeed, 2014). Additionally, some researchers investigated writing change functions and language functions in peer interactions within small groups (e.g., Li, 2014; Li & Kim, 2016; Li & Zhu, 2017; Wang 2019), while others (e.g., Steinberger, 2017; Wu & Schunn, 2020) discussed revision behaviours, or negotiations in collaborative revision (Hanjani & Li, 2014; Lee, Bernstein, & Georgieva, 2019). This study discusses these sub-strands as follows.

2.4.3.1 Writing Change Functions (WCFs)

In Li's (2013) study which explored the process of wiki-based CW in a small group of EFL Chinese university students who were engaged in reciprocal interaction through the web-based channel, she discovered five main types of WCFs that the EFL learners were engaged in when they worked in small groups. The five main types of WCFs are addition, deletion, rephrasing, reordering, and correction. Li's study was congruent with the earlier study carried out by Mak and Coniam (2008) who found that ESL learners in small groups when engaging in CW would employ WCFs, such as adding ideas, expanding ideas, reorganizing ideas, and making a correction on errors that emerged in the CW process. The WCFs with their definitions given by Li and Kim (2016) are listed in Table 2.3.

Table 2.3 Writing Change Functions and Their Definitions

Writing change functions	Definitions
Adding	Contributing new contents or adding information to the existing contents at different levels, in different forms
Deleting	Removing texts or existing information
Rephrasing	Expressing existing ideas in an alternative way
Reordering	Reorganizing ideas or moving contents around
Correcting	Correcting or attempting to correct mistakes in grammar, mechanics, and spelling
Two main categories	
<i>Self-edit</i>	Writing changes made to the texts composed by member himself/herself
<i>Other edits</i>	Writing changes made to the texts composed by other group members

(Adapted from Li & Kim, 2016)

Another study, conducted by Kessler et al. (2012), explored the changing nature of CW among university students at a Midwestern University of America. The researchers found that students put more focus on meaning changes (e.g., text that contributed to meaning were added, deleted, or replaced) than form (e.g., capitalization, part of speech, punctuation, pluralization, spelling, tense, spacing and grammatical changes). This might be because the participants possessed a high level of language proficiency and they focused more on the global level (content and organization) rather than the local level (grammatical mistakes or language mechanism).

A recent study on WCFs, conducted by Vorobel and Kim (2017), examined how adolescent English language learners changed their writing after receiving feedback from their peers through CW. The researchers found that the English language learners made most changes at the local level (e.g., grammar, vocabulary, formatting, and spelling errors), whereas the global level of writing (e.g., development and organization of idea, cohesion) received less attention in feedback and revision. This might be because these students were restricted in their language proficiency and limited knowledge of vocabulary, so they could not delve into the details of the content they discussed. A similar finding was also reported in Dobao's (2014) study. Learners with a low language

proficiency paid attention to form rather than organizational structure or content. The ESL or EFL students' writing revision behaviours discussed in the above studies showed, to a certain extent, their contribution to the CW process but this needs further investigation. The following subsection discussion focuses on LFs in peer interaction.

2.4.3.2 Language Functions (LFs) in Peer Interaction

The other line of inquiry with respect to the revision behaviours is LFs. This emerged during peer interactions in small groups. Previous studies (e.g., Li, 2014; Li & Kim, 2016; Li & Zhu, 2017) investigated dynamic group interactions via wiki-based CW tasks. Li's (2014) study revealed that different characteristic patterns of interaction emerged from the CW tasks. The various patterns (e. g. , collective – active/ withdrawn, dominant/ defensive - collaborative, expert/novice, and cooperating in parallel) were allocated LFs demonstrated by learners in small groups while dealing with joint writing tasks. Li's study was congruent with the earlier research of Storch (2002) who primarily discovered four distinctive types of collaboration. Tan, Wigglesworth, and Storch (2010) added a “cooperative pattern” to the dyadic interaction model. The revised model of dyadic interaction singled out five types of collaboration: 1) collaborative, 2) dominant/dominant, 3) dominant/passive, 4) expert/novice, and 5) cooperative. Storch's model of dyadic interaction is illustrated in Figure 2.18.

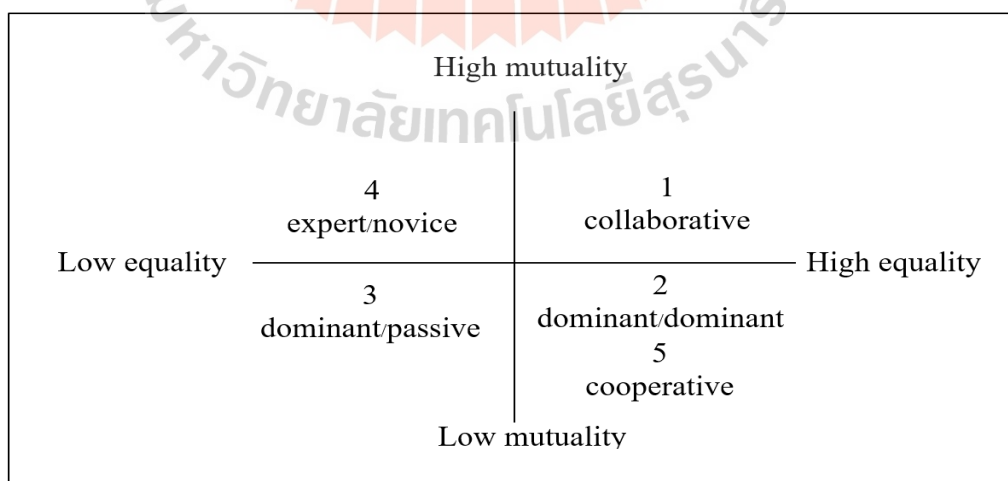


Figure 2.18 A Model of Dyadic Interaction (Storch, 2013, p. 62)

As seen (Figure 2.18), two axes stand as a continuum to distinguish the differences. The horizontal axis represents equality (degree of control over the group task or equal contributions and distribution of turns) ranging from low to high equality, whereas the vertical axis defines the notion of mutuality (the level of engagement and interaction with group partners' contributions) ranging from low to high mutuality (Storch, 2002). The pattern in Quadrant 1 is labelled collaborative which depicts moderate to high levels of equality and mutuality (Tan et al., 2010). This can be interpreted to mean that group members contribute their part and engage with each other's input. In Quadrant 2, there are two patterns of interaction: dominant/ dominant and cooperative. The dominant/dominant pattern may show moderate to high equality but low mutuality. In other words, group members contribute to the task and may compete for control over the task, but they pay less attention or hardly engage with each other's contributions (Tan et al., 2010). This occurs when team members have high self- confidence in their performance and want to control the task. The second pattern in this quadrant is labelled cooperative. The group members proportionally contribute to the task and their equality may appear moderate to high, but their mutuality is rather low. They do not compete for control over the task, but rather divide the work and fail to engage with each other's input. Therefore, the completed task is simply a compilation of individual contributions with relatively low interaction. Thus, this pattern is placed in Quadrant 2 in Storch's initial model of dyadic interaction.

In Quadrant 3, the pattern of interaction is labelled dominant/passive, and the level of equality and mutuality are medium to low. This implies that one member in the group takes control of the task or plays a dominant role, while the other members are passive participants. This results in little negotiation, since contributions from the group members are unequal (Storch, 2002). Lastly, Quadrant 4 depicts moderate to low equality but moderate to high mutuality. The pattern emerging from this quadrant is identified as expert/novice, in which one member in the group contributes more than others do, and plays a dominant role as an expert to lead the team. Unlike the dominant/passive

scenario, in which the main contributor fails to provide support to other members, the dominant member in the expert/ novice pattern supports and encourages the team members to actively contribute throughout the CW process (Storch, 2002; Tan et al., 2010; Zhang, 2018).

We can see that learner working in pairs or groups display different patterns of interaction depending on the type of task or working modes or competency of the collaborators (Wang 2019; Zhang, 2019). Inevitably, LFs are widely used across the small groups while negotiating their collaborative task. The LFs frequently used are such as acknowledging, agreeing, clarifying, confirming, disagreeing, elaborating, eliciting, encouraging, greeting, justifying, questioning, requesting, and suggesting. These LFs used by small groups bring forth various patterns of interaction, which influences the groups' writing product (Li, 2014; Li & Kim, 2016). Table 2.4 displays the taxonomy of LFs proposed by Li & Kim (2016).

Table 2.4 Taxonomy of Language Functions

Language Functions	Definitions & Examples
Eliciting	Asking or inviting for more comments, thoughts, or ideas from peers E.g., <i>What about your idea towards this point?</i>
Greeting	Greeting or saluting peers or team members E.g., <i>Hi dear friends!</i>
Justifying	Verifying or explaining one's viewpoints by giving rationale E.g., <i>We need more detail on states that impose curfew hours after midnight.</i>
Questioning	Making inquiries on statements or texts that are not clear E.g., <i>Where is the supporting detail to the topic sentence?</i>
Requesting	Making requests or requirements for something related to co-constructed texts E.g., <i>Can you please add more evidence to support this statement?</i>
Stating	Addressing one's opinions or ideas or information previously discussed E.g., <i>Things we need to support such claim are research findings or quotes.</i>
Suggesting	Giving suggestions or propositions about content or structure of the essay. E.g., <i>We should add a little more to improve this paragraph to make it better.</i>

Table 2.4 Taxonomy of Language Functions (Continued)

Language Functions	Definitions & Examples
Responding	Acknowledging Complimenting or phrasing peer's comments, ideas, or supports E.g., <i>Thank you for this reminding to add a quotation mark.</i>
	Agreeing Expressing agreement with peer's directions, stance, or viewpoints E.g., <i>Yes, I totally agree with this point.</i>
	Disagreeing Expressing disagreement with peer's directions, stance, or viewpoints E.g., <i>I don't think to just leave it like this.</i>
	Elaborating Giving or adding more information on self or peer's ideas on writing or content E.g., <i>There are issues we ought to add on in this third paragraph.</i>

(Adapted from Li & Kim, 2016)

As noted in Table 2.4, LFs occur while group members negotiate with one another in achieving their goal to finish the task. These LFs serve as cognitive and social functions to help them accomplish their work (Li & Zhu, 2017), and LFs may indicate their active involvement in their peers' contributions. The following subsection discusses episodes in small group writing.

2.4.3.3 Discussion Episodes in Small Group Writing

In Steinberger's (2017) study, L2 learners were formed in small groups of three to work on synchronous CW assignments via GD. The qualitative findings revealed several types of discussion episodes that included language, content, and social aspects. The language types involves "form-oriented language-related episodes" (grammatical accuracy, form and tense of the verb, form of adjectives, adverbs, and articles, prepositions, linking devices and word order) (Amirkhiz et al., 2013; Steinberger 2017); "meaning-oriented language-related episodes" (Amirkhiz et al., 2013; Steinberger 2017), involving word choice, style, register, translation, alternative ways of expressing opinions or thoughts, lexicogrammatical issues; and "mechanics-oriented language-related episodes," which deals with punctuation, pronunciation, and spelling (Amirkhiz et al., 2013; Steinberger 2017). The content type includes content structure and coherence (logical structure, sequence of ideas, event or content). Lastly, the social type covers

workflow management (assigning a task to respective members, negotiating and implementing a work plan) and small talk (greeting, making appraisal and comment, expressing gratitude, showing a sense of humor) (Steinberger, 2017). Language-related episodes (LREs) involve any part of a dialogue where language learners talk about language, discuss with peers, ask and correct themselves while engaging in the group task (Jackson, 2001; Hsu, 2020; Villarreal & Gil-Sarratea, 2020). It also incorporates, interact on text revisions, particularly in CW process, and involves scaffolding and non-scaffolding that produce LREs. According to Saeed and Ghazali (2017), LREs in the form of scaffolding comments are presented by requesting advice, providing advice, eliciting and responding to elicitation, providing options or alternatives, instructing, and defining. These scaffolding comments provide assistance within learners' ZPD to deal with language issues while performing group task (Saeed & Ghazali, 2017). On the contrary, non-scaffolding comments include requesting clarifications, justifying (defending comments), comprehension check, expressing certainty or uncertainty, speculating, and comparing. These non-scaffolding comments failed to provide the members with explicit evidence of verbal assistance (Saeed & Ghazali, 2017). Thus, scaffolding comments increase collaborative dialogues in handling conflicts while performing group work (Chen, 2020).

Unlike synchronous writing, the asynchronous writing does not require an immediate response from the collaborators. The members, therefore, can formulate thoughts and provide extensive comments or even revise each other's input without a time restriction. Group performance in the asynchronous mode is perceived as more effective than working in the time-restricted schedule. This applies if the team members support each other for they have more time and they can produce richer texts in terms of lexical or syntactic features when they work on revisions and modifications (Ajabshir, 2019; Hsu, 2020). As revealed in Saeed and Ghazali's (2017) study, the interactions and text revisions in asynchronous group writing are discussed extensively not only in relation to academic-related matters dealing with group writing tasks, but also encompass social comments such as praising, social presence, and expressing feelings. These LREs employed by the participants in these aforementioned studies could drive their negotiation to reach

a consensus and accomplish the task. The following section discusses the negotiations in collaborative revision.

2.4.3.4 Negotiations in Collaborative Revision

The other approach to analyze L2 collaborative revision interactions is to observe negotiation strategies learners use while engaging on a CW assignment. Hanjani and Li (2014) investigated EFL learners' collaborative revision activity on argumentative texts. They found that learners employed different strategies in their negotiations, which include evaluative negotiations (pair discussions and joint efforts to fix mistakes found in the texts), social negotiation (expressing feelings, thoughts, emotions to carry on the dialog to reach a consensus), and procedural negotiations (clarifying instructions, assigning responsibilities, or giving directives to the partner).

In evaluative negotiations, Hanjani and Li (2014) classified them into two categories: a) scaffolding negotiations (support via verbal instruction, giving linguistic support to broaden their peers' cognitive development, offering alternatives to amend texts to improve the quality of writing).

b) non-scaffolding negotiations (clarifying texts, accepting advice or rejecting advice, expressing certainty or uncertainty in the texts produced by the peers, or comprehension check). According to Hanjani and Li (2014), non-scaffolding negotiations may not directly provide group members with scaffolded support to help them with revision, but they indirectly assist in amending errors and contribute to improvement of writing quality.

Social negotiations are an essential component of group work. In CW revision or peer feedback, social negotiations involve expressing feelings, emotions, opinions or perceptions, or even expressing surprise, or frustration to continue the conversation with the interlocutors to accomplish the task (Hanjani & Li, 2014; Lee, Hampel, & Kukulska-Hulme, 2019). Social negotiation may take place either on-task (reading peer comments, or making a correction, expressing surprise or confusing), or off-task (learners dialogue on irrelevant issues or are not engaging in the task such as telling jokes) (Hanjani & Li, 2014; Lee et al., 2019). As sociocultural theory posits that social

interaction and negotiation among language learners is done using language as a “symbolic tool” to clarify and enhance new knowledge being investigated (Shooshtari & Mir, 2014). Issues being discussed must be well understood among the negotiators. On some occasions, their interactions may indirectly address the issues being discussed, or their discussion is not forced but flows in a spontaneous way (Van Lier, 2004).

Lastly, procedural negotiations refer to directing partners or assigning responsibilities or informing them what they should do next after completing initial stages. This may include requesting peers to read previous comments made by other peers or instructors before revising linguistic or mechanical issues (Hanjani & Li, 2014). Procedural negotiations during the CW revision process should be dealt in a positive manner to maintain a healthy relationship in a teamwork environment.

The subheading of 2.4.3 (writing/revision behaviours) reviewed a number of studies researched over the past decade in relation to CW revision behaviours. Those studies addressed different foci, such as WCFs (Kessler et al., 2012; Li, 2013, 2014; Mak & Coniam, 2008; Vorobel & Kim, 2017), LFs in peer interactions (Li 2014; Li & Kim, 2016; Li & Zhu, 2017), discussion episodes in small group writing (Amirkhiz et al., 2013; Hsu, 2019; Steinberger, 2017), and negotiation strategies in CW revision (Hanjani & Li, 2014). The revision behaviours of L2 writers found in the reviewed studies varied widely depending on their level of language proficiency, relationships among group members, learning atmosphere, individual characteristics, or other social factors. These varied behaviours lay the groundwork and shed light on writing teachers to design effective WBCW activities and implement them practically in this digital age where knowledge is no longer restricted to classrooms or educational settings (Wu & Schunn, 2020). The following subsection discusses the interaction hypothesis (IH) that L2 learners employ when they collaborate in small groups.

2.4.3.5 Interaction Hypothesis

The concept of interaction hypothesis (IH) was first proposed by Long (1981). He investigated conversations between native speaker (NS) and non-native speaker (NNS) pairs in varied occurrences and notified such communications made possible through

repetitions, modification of interaction, expansion, and clarification request to rectify the ongoing conversational hurdles (Long, 1983). In his earlier work, Long claimed that language input is essential and sufficient for second language acquisition (SLA), but his initial IH was criticized by Ellis (1991), who argued that comprehensible input facilitates language learning but is neither necessary nor sufficient for acquisition as it fails to address all elements of the learning process. Aside from comprehensible input, learners must be stimulated to bring out comprehensible and grammatically accurate output to expand their linguistic resources (Swain, 1993) and make interaction effective. Later, Long (1996) revised his IH and stated,

“...it is proposed that environmental contributions to acquisition are mediated by selective attention and the learners’ developing L2 processing capacity, and these resources are brought together most usefully, although not exclusively, during negotiation for meaning. Negative feedback obtained during negotiation work may be facilitative of L2 development...” (p.414)

In the revised version of his IH, Long (1996) asserted that negotiation for meaning that occurred between the interlocutors, particularly conversations between NS and NNS or partner with more language competence, facilitates learning as it brings language inputs, accumulated language ability, selective attention, and language output in a more productive way. Nevertheless, Ellis (1991) commented that interaction or negotiation might work best with L2 learners who have accumulated adequate grammar rules or reached an intermediate level in English. However, it may not be much effectual for a beginner who does not have sufficient linguistic resources or knowledge of the language, or an advanced learner who tends to venture more on interpretation or opinion rather than comprehension or language clarity (Tran, 2009). Furthermore, interaction between interlocutors is incubated by other factors, including learners’ language ability or their readiness to negotiate, or willingness to express themselves in the target language (Cao, 2011, 2014; Lee et al., 2019). Long’s IH received some criticism for not providing sufficient explanation for SLA. For example, when language input is over simplified to become comprehensible, learners may no longer need to acquire those new complex

features. How interactional modifications support learning is not fully envisaged, which requires further studies (Ellis, 1991). However, to date, IH has given rise to reasonable interest among researchers and educators in the field of SLA (Ellis, 1991; Tran, 2009; Ebrahimi, 2015) for further investigation.

In the following section, related research studies are discussed that employed GD or Wikis to investigate the effects of CW activities with CW behaviours in the ESL/EFL classroom. This will provide an overview of the research paradigms in the field and serve as a fundamental principle to put more focus on scrupulous research on CW with emerging computer-mediated writing tools available today.

2.5 Previous Studies of CW with GD/Wikis

In this section, relevant studies are reviewed that relate to the use of WBCW tools (e.g., GD, Wikis) that were published between 2017 and 2021. These include studies that focus on (a) CW process (b) CW revision and (c) CW with visualizing interaction. In this review keywords searches (e.g., online collaborative writing, collaborative writing and Google Docs, collaborative writing revision) were used and entered in a well-known academic database, Scopus. Ten studies are precisely discussed and summarized using Yim & Warschauer's (2017) diagram, which includes the following categories: theoretical framework, technology type, research interest, participants, research design, and methods. The related research studies are outlined from the most recent to the oldest one in Table 2.5.

Table 2.5 Selected Research Studies that Used Web-Based Collaborative Writing Tools (GD, Wikis).

Study	Theoretical Framework	Technology Type	Research Interest	Participant	Research Design	Methods
Elabdali (2021)	Sociocultural theory	Not clearly mentioned	The benefits of collaborative writing	Analysis of 33 studies related to collaborative writing published between 2002-2019	A narrative review of product-oriented collaborative writing studies	Systematic review of research studies related to collaborative writing
Teng (2021)	Not specified	Ebeam software	Collaborative writing supported by interactive whiteboard technology on students' writing performance	120 EFL students from a Chinese university	Mixed method approach: two experimental groups and one control group	Pre-test; post-test; One-way ANOVA; Qualitative data from records of discourses during CW process
Elabdali & Arnold (2020)	Sociocultural theory	Wiki	Interaction patterns; group interactions and their final written product	9 EFL learners from the Northwestern university, USA.	Case study: a combination of inductive and deductive analyses	Text analysis using transcripts of wiki discussions, wiki revision histories
Hsu (2020)	Sociocultural theory	Google Docs	Task complexity and patterns of interaction during web-based asynchronous collaborative writing tasks	26 EFL learners from a Taiwanese university	Descriptive; qualitative	Empirical study to explore different patterns of interaction; use of language functions
Ardiasih, Emzir, & Rasyid (2019)	Not specified	Wiki	Online collaborative writing technique to enhance argument essay writing	29 university students from Universitas Terbuka, Indonesia	Descriptive; a small portion of qualitative	Paired-sample T-test; online questionnaire
Alghasab, Hardman, & Handley (2019)	Sociocultural theory	Wiki	The role of teachers in supporting collaborative learning	53 students from 3 government high school classes in Kuwait	Mixed method approach	A multiple case study based on Yin's (2018)

Table 2.5 Selected Research Studies that Used Web-Based Collaborative Writing Tools (GD, Wikis). (Continued)

Study	Theoretical Framework	Technology Type	Research Interest	Participant	Research Design	Methods
Berdun et al. (2018)	Not specified	Google Docs	Interaction process analysis free text interactions from collaborative writing	82 university students in Argentina	Descriptive; qualitative	International process analysis (IPA) methods introduced by Bales (1950)
Zhao (2018)	Sociocultural theory	Not clearly mentioned	Peer interaction patterns; mediating strategies	18 undergraduates from a large university in China	Mixed method: Quali + Quanti	Audio-recorded with digital recording pens Text analysis from oral peer feedback
Steinberger (2017)	Sociocultural theory; cognitive SLA theories	Google Docs	Synchronous collaborative writing process; revision behaviour	24 German university students	Qualitative	Text analysis using revision history functions, interviews
Yim et al. (2017)	Not specified	Google Docs	Synchronous collaboration collaborative writing styles differences in collaboration characteristics	45 Google Docs documents produced by 82 university students	Mixed method approach	Empirical study to explore different styles of synchronis collaboration



Table 2.5 summarizes the major findings and implications proposed by the researchers from each of the studies highlighted. Most of these reviewed studies are driven by the sociocultural theory of learning with the integration of modern technology to transform the traditional mode of L2 learners' CW behaviours from paper-based to electronic-based records by using CMC tools.

Yim et al. (2017) used a mixed-method approach to carry out an empirical study to examine the divergent styles of synchronous collaboration in 45 GD documents written by 82 university students. The researchers discovered that four distinctive styles of writing emerged from the history of CW document: the main writer, divide and conquer, cooperative revision, and synchronous hand-on style (Yim et al., 2017). The findings also suggested that collaboration characteristics have a relation to both quality and quantity of text. Multi-level regression analysis revealed that when there were more collaborators this led to better language mechanics, while balanced participation yielded higher scores in content. The researchers posited that more studies were needed to explore factors contributing to divergent styles of collaboration patterns at a group or individual level.

Steinberger (2017) carried out another study on synchronous collaborative L2 writing by using GD as a writing platform. The participants were 24 German medical students who learned English as their second language. The focal interest was how these L2 learners negotiated in their CW process in GD. Qualitative data analysis revealed three key findings: Firstly, students were actively involved in the activity, providing them various opportunities for creating and negotiating language output in the collaboration process. The analysis showed that students focused primarily on content and workflow-related discussions. Secondly, the analysis showed that the students articulated certain features of the writing process during the meta-discussions. Students interacted more frequently on the content-related issue at the planning stage, but their discussions declined in the final phase. Lastly, the analysis disclosed a downside effect on chat activity and writing achievement in the final version. This implies that groups who performed worst in the final texts spent a considerable amount of time chatting when compared with the more successful groups, who dedicated more time to the task. The researcher proposed that web-based

technology should be used with caution for future research, and language teachers need to give clear guidelines on how to utilize this WBCW tool to its optimum extent for a joint project.

Zhao (2018) examined the interaction patterns and their relations to mediating strategies, and the relations between the amount and focus of peer feedback and interaction. The research findings showed three distinct patterns of interaction: collaborative interaction, dominant/dominant interaction, and expert-novice interaction. In relation to the mediating strategies and the amount and focus of peer feedback and interaction patterns, the statistical analysis revealed significant differences in quality. There was a wide range of mediating strategies among the three patterns used. The analysis revealed that expert/ novice and collaborative patterns were employed principally, followed by varied mediating strategies, including the dominant/dominant pattern. The most frequently used mediating strategy across the three patterns was by providing direct feedback with revision solutions and giving indirect feedback. Further exploration might be dedicated to the impact of peer interaction and how their interaction and mediating strategies are interconnected to the competence of writing quality and language expansion.

Algahsab et al. (2019) examined the role of teachers in supporting learners in online interaction while engaging in CW through wiki activities. The participants were 53 students from 12th grade classes in Kuwait who were trained to write, make dialogues, and participate in discussion on wikis. The major findings revealed that when the teachers employed a directive approach to comment on students' writing in wiki, the students would interact with the teacher rather than with their peers in the group. However, when the teachers adopted a dialogic strategy, students interacted more with their peers and they showed a tendency to collaborate with one another in constructing texts. The researchers recommended adopting a dialogic approach, as it had a positive impact on students CW process while performing tasks on a web-based tool.

Ardiasih et al. (2019) investigated the effect of OCW technique for writing argumentative essays in wiki-based writing platform. The participants were 29 Indonesian

EFL students. The researchers employed two main types of instruments: test (pre- and post-test) and non-test (questionnaire related to aspects of changes in attitude). The results of the paired sample t-test and the analysis of learners' perceptions showed that the OCW technique using wiki-based writing platform integrated in Moodle has a positive effect on learners' argumentative essay writing skills. Learners reported having positive learning experience in participating in OCW technique. The researchers recommended using OCW technique to develop EFL learners' writing skills, and provide proper guidelines for learners in that they can gradually improve their own writing skills.

One year later, Hsu (2020) examined how increased task complexity influences interaction patterns on WBCW tasks. The participants were 26 students at a Taiwanese university. The researcher used two CW tasks: one simple (explore the advantages of online social technologies) and one complex (argue with reasons if students should take responsibility for bullying if victims ended up committing suicide). Learners in pairs were given one week to complete each task in Google Docs. The researcher identified and compared if task complexity influenced peer interaction patterns. The study showed that the interaction patterns remained unchanged across tasks. In other words, task complexity showed no influence on peer interaction patterns. The researcher proposed using WBCW to highlight the significance of co-authorship and collective efforts in L2 CW classroom to enhance writing skills.

In the same year, Elabdali & Arnold (2020) investigated the fluidity of interaction patterns demonstrated by four groups of Asian EFL learners in a creative writing class. The researchers required the participants in small groups to compose a narrative essay in wiki-based writing platform. Data sources were collected from transcripts of the wiki discussions, revision histories, and the final written products. The study revealed that the groups exhibited higher equality in the wiki discussion than the edit mode. The teams tended to navigate their CW task and achieve communicative purposes. Furthermore, the exploration of connections between interaction patterns and text quality revealed that the group demonstrating high mutuality produced longer stories. Future research could

further investigate if small group interaction patterns in multiple modes are affected by learners' L1 status or their L2 proficiency.

In a more recent study, Teng (2021) examined the effects of CW supported by interactive whiteboard technology on learners' writing performance. The participants involved 120 EFL undergraduates from a Chinese university. The researcher randomly divided the subjects equally into three groups: two experimental groups (interactive whiteboard-integrated CW group; traditional whiteboard-integrated CW group, and one control group. The dependent variables included a post-test writing test measuring possible writing improvement, audio and video records of discourses collected during CW process. The participants from three different groups were engaged in the experiment that lasted five weeks. The quantitative results revealed that learners in the interactive whiteboard-integrated CW showed greater improvement in their writing performance, followed by the group with traditional whiteboard-integrated CW. The control group without whiteboard technology showed the least improvement in their post-test writing. The researcher recommended further exploring the various individual and group factors that may affect learners' interaction in the OCW context.

Although studies on CMC tools to enhance learners' writing skills have been progressively researched over the past decade with the development of data visualization tools that can assist instructors to monitor learners' writing behaviours as well as their proportional contribution, there is relatively scarce research data that examines CW behaviours of small groups from diverse cultural backgrounds. Further investigation is needed to enrich the existing literature in sociocultural perspective underpinning CW in a multicultural classroom setting.

Previous research explored peer interaction patterns and mediating strategies through the lens of the sociocultural theory by using monolingual Chinese EFL learners (Zhao, 2018), or Indonesian EFL learners (Ardiasih et al., 2019). From these previous studies, conclusions regarding interaction patterns and mediating strategies were drawn from monolingual learners who spoke the same native tongue. It would be enthralling to investigate small group CW styles and interaction patterns from multilingual English

language learners from Asian countries undertaking English composition course. To bridge this gap, this study attempted to examine the effects of CW activities and explore small group CW styles and interaction patterns of multilingual English learners in an English composition classroom. Furthermore, the researcher sought to investigate the relationship between learners' text contribution, their use of WCFs and LFs and their post-test writing performance, which of these issues have not been studied or reported elsewhere in the previous studies. As recommended by Yim et al. (2017), to further examine factors contributing to different CW styles or patterns of interaction in small groups. Furthermore, Hsu (2020) proposed to further investigate if the increased task complexity (e.g., description and argumentation) has any influence on group interaction patterns while members collaborate on a web-based writing tool such as GD. The findings could contribute to the existing body of knowledge related to OCW in a multilingual English language classroom context. To date, research investigating OCW in a multilingual English classroom in Asian countries where culturally diverse learners jointly constructing texts in small groups is still in its infancy, which needs further exploration.

In addition, there are few investigations of WBCW activities using text mining and visualization to raise awareness in collaboration and contribution. Recently, research studies (e.g., Krishnan et al., 2018; Yim et al., 2017; Warschauer et al., 2019) utilized DocuViz that can generate the entire revision history of a co-authored document on GD. One group of researchers (e.g., Yim et al., 2017) analyzed documents in GD and examined various styles of synchronous CW. The team employed DocuViz to detect commonly used writing styles and examined how characteristics of writing styles related to the quality and quantity of jointly written texts. Such a study needs further investigation to prepare L2 learners to produce texts with better quality and raise their awareness to contribute actively during the CW process. Taking this into account, DocuViz, was employed to explore multilingual English learners' CW styles when they jointly construct texts in small groups.

To conclude, this chapter presented the major concepts and theoretical frameworks that guided the study. Since the study focused on the effects of WBCW activities in L2

contexts and learners' interactions, discussion was required of key related perspective of writing and the presentation of an overview of the nature of L2 writing, multilingual learners in L2 writing context, characteristics of multilingual learners, writing and Thai EFL learners, factors shaping L2 learners' writing performance, together with an outline of approaches to teaching L2 writing, which include product, process, and genre approaches. The second section of the chapter was devoted to a discussion of the theory of social constructivism and sociocultural theory, which are the core theoretical foundation underpinning CW activities and interactions. The application of sociocultural theory in teaching L2 writing was also explained. The third section of this chapter investigated CW strategies. It also discussed the current body of literature on CMCW, which includes WBCW tool such as GD and DocuViz. Additionally, this section reviewed writing and revision behaviours that included writing change functions, language functions in peer interactions, discussion episodes in small group writing, negotiations in collaborative revision, and interaction hypothesis. This could help explain L2 learners' CW behaviours and their interactions during group collaboration to address the research objectives. The final section of this chapter reviewed previous related studies of WBCW tools such as Wikis or GD that were conducted in different geographical regions of the world over the past five years. Then the researcher identified the research gaps and how this study could fill these gaps. In this dissertation study, the researcher investigated multilingual English learners' OCW tasks and their small group interactions in the English composition class at an international university located in central Thailand. The next chapter presents the research methodology used in the study.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the research methodology used to achieve the research objectives outlined in Chapter 1. The research methodology includes research design setting of the study, participants, variables, instruments, data collection procedures, data analysis, trustworthiness and validity, researcher's role, and the preliminary results of pilot study. Ethical considerations pertaining to this research study are also discussed at the end of this chapter.

3.1 Research Design

In this research study, the researcher employed a pre-experimental or a single-group pre-test and post-test design with a combination of embedded case study to investigate the effects of CW tasks on writing performance of multilingual English learners and explore learners' perceptions of WBCW experiences. The study further examined learners' CW and interaction patterns and sought if there was any correlation among learners' text contribution, their use of WCFs and LFs, and their post-test writing performance. The pre-experimental design used in this current study is illustrated in Figure 3.1.

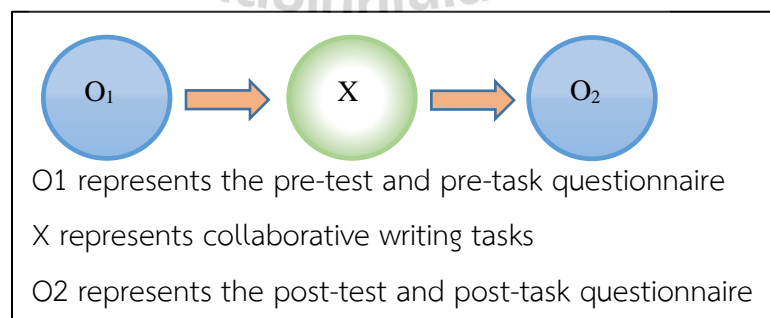
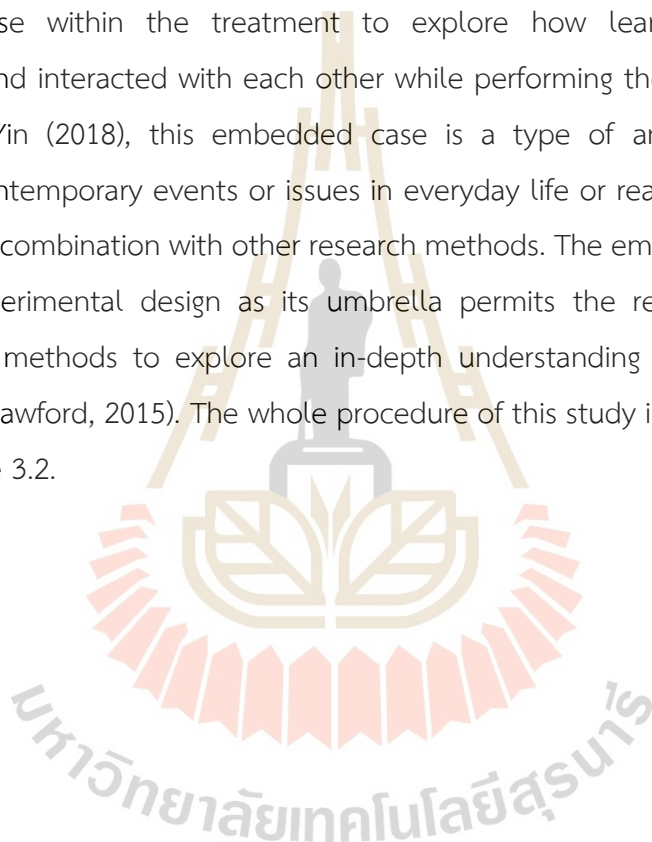


Figure 3.1 Pre-Experimental Design Used in the Study

In this study, a pre-experimental design refers to an entire English composition I students being investigated under the study who took a pre-test, then received the intervention (CW tasks) provided by the researcher, and then took a post-test after the intervention (Jackson, 2008). The researcher did not only pay attention to the effects of the treatment, but also explored how the participants manipulated the treatment received. In other words, the researcher used an exploratory technique known as an embedded case within the treatment to explore how learners in small groups collaborated and interacted with each other while performing the CW tasks (treatment). According to Yin (2018), this embedded case is a type of an empirical study that investigates contemporary events or issues in everyday life or real-life contexts in that it can be used in combination with other research methods. The embedded case integrated in the pre-experimental design as its umbrella permits the researcher to employ a multiplicity of methods to explore an in-depth understanding of phenomenon being investigated (Crawford, 2015). The whole procedure of this study is shown in the research design in Figure 3.2.



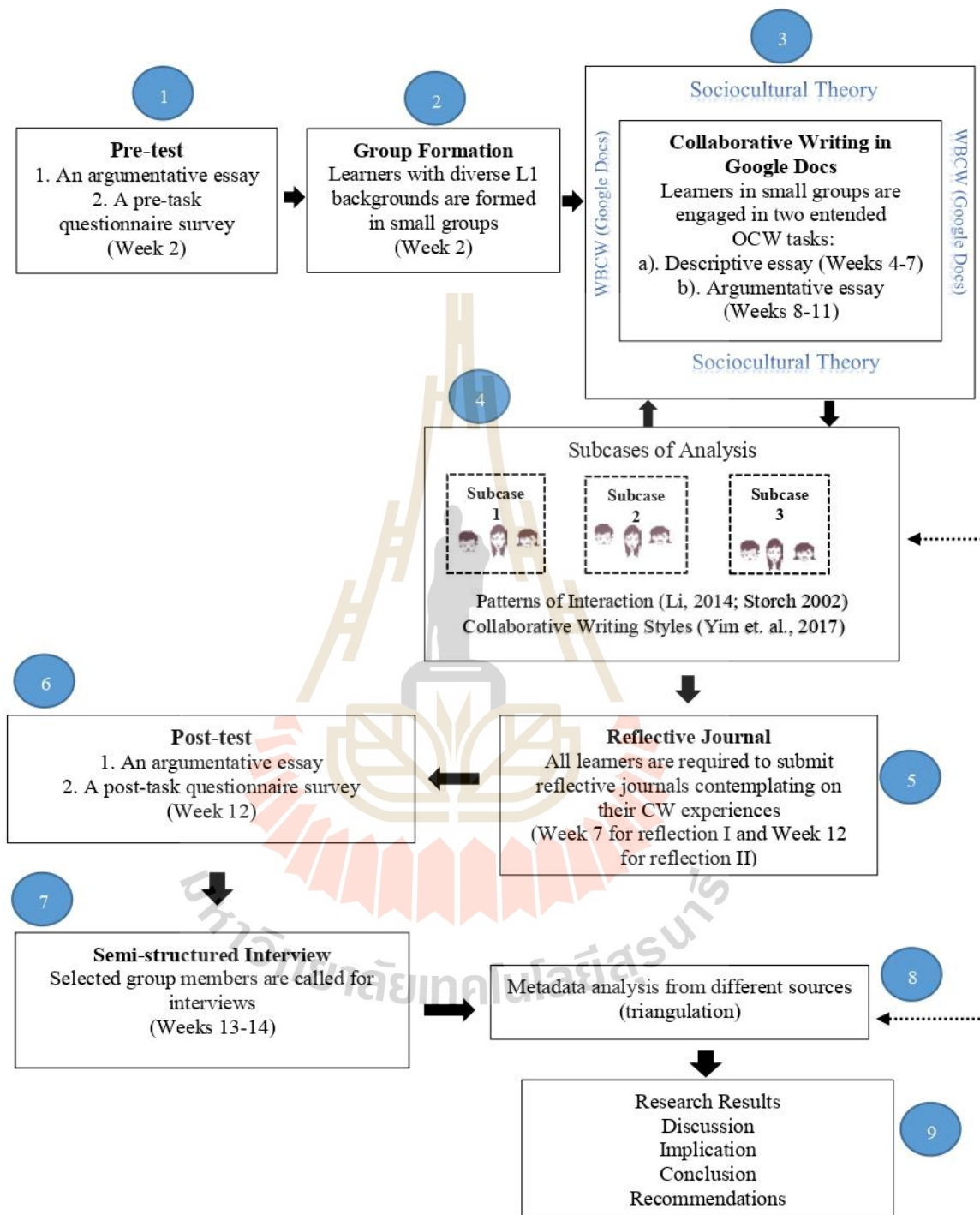


Figure 3.2 Visual Diagram of Research Design

The research study spanned a period of 14 weeks or one semester. As seen (Figure 3.2), the pre-test writing and pre-task questionnaire survey were administered and the formation of small groups were conducted in the second week of the study. Then, learners were engaged in two OCW tasks (descriptive and argumentative essays) for a period of six weeks. After completing each CW task, learners were required to submit their reflections. Therefore, students' reflective journals were collected in week 7 and week 12.

From there on, the researcher investigated small groups' CW tasks in GD, and selected the groups (see number 4 in Figure 3.2) that demonstrated maximum variations in terms of unique CW styles and dynamic interaction patterns. Additionally, the researcher examined small groups whose members comprised various L1 backgrounds, different English language proficiency levels, and at least two members in the group were off campus during the time of data collection, as the selection criteria. The post-test writing and post-task questionnaire survey were administered in week 12, followed by the semi-structured interviews with selected group members (12 participants) in weeks 13 and 14. The researcher performed metadata analysis by taking an in-depth look at the selected groups' CW behaviours and interaction patterns (see the dotted line connecting numbers 4 and 8) for triangulation and data enrichment to increase the credibility and validity of the results prior to writing up research findings and discussion to complete the project.

3.2 Setting of the Study

This study was undertaken at the Faculty of Arts and Humanities (FAH) of Asia-Pacific International University (AIU), Saraburi Province, Thailand where the researcher is tenured. The FAH is comprised of three departments, which are the English as a Second Language (ESL) Department, the English International Program Department, and the English Thai Program Department, with a total of 250 students and 22 English teachers in the three departments during the 2020-2021 academic year when the study was conducted. About 50 % of the faculty's student body are Thai residents, and another 50% come from other countries include Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, the

Philippines, and Vietnam. The 22 English teachers come from seven different countries: 2 Americans, 3 Filipinos, 6 Indians, 1 Indonesian, 1 Korean, 5 Malaysians, and 4 Thais.

The FAH offers four strands of study consisting of English for Communication, Teaching English to Speaker of Other Languages (TESOL), English for Business, and English for Communication in Thailand designed for Thai students. The FAH aims to produce graduates and prepare them for careers in a multilingual and multicultural world that uses English as its *lingua franca* for communication.

Aside from designating professional courses for the English language major, the FAH also offers general education (GE) courses that include language classes such as English composition I and English composition II. All first-year AIU students from various academic disciplines are required to take these two language courses in partial fulfillment of the requirements for their program of study. This study focuses on English composition I, which carries three credit hours. The course intends to equip learners to develop various types of essay writing using the four principles of unity, support, coherence, and sentence skills. English composition I is scheduled in both academic semesters from August to December (Semester I) and from January to May (Semester II). The class meets three hours per week during the operating semester. To maximize the learning efficiency and create opportunities to engage learners in class activities, the maximum class size for English composition I is limited to 35 learners per class. Learners can make use of resources in the language laboratory provided by FAH. In addition to this, learners can take self-directed learning in the university library equipped with computers, online resources, databases, high-speed Internet, and many more facilities provided to accommodate learners' needs. More information about the research participants is discussed in the following section.

3.3 Participants

The research participants were comprised 35 first-year university students majoring in various academic disciplines (e.g., Accounting, Computer Information Systems, Education, English Language, Management and Entrepreneurship, Public Health, and Religious Studies). The participants enrolled in ENGL111 English composition I in the first semester

of the 2020 -2021 Academic Year as a required general education course for all first-year university students.

The researcher employed a simple random sampling (SRS) technique by requesting the University Admission and Records Office to list all names of 102 new undergraduate students enrolling in English composition course in the semester, and randomly selected them into three groups (sections) equally. This would allow individuals to have an equal chance to be selected into the present study, and they could represent the whole population of first-year university students undertaking the composition course. The researchers received 35 first-year university students (13 females, 22 males) coming from nine different countries in Asia, namely Cambodia (2), China (4), India (2), Indonesia (4), Malaysia (6), Myanmar (5), the Philippines (2), Thailand (8), and Vietnam (2). Their English language proficiency levels ranged from pre-intermediate to advanced [comparable to A2 – C1 based on the Common European Framework of Reference for Languages (CEFR) scale]. The demographic profile of the research participants is summarized in Table 3.1.

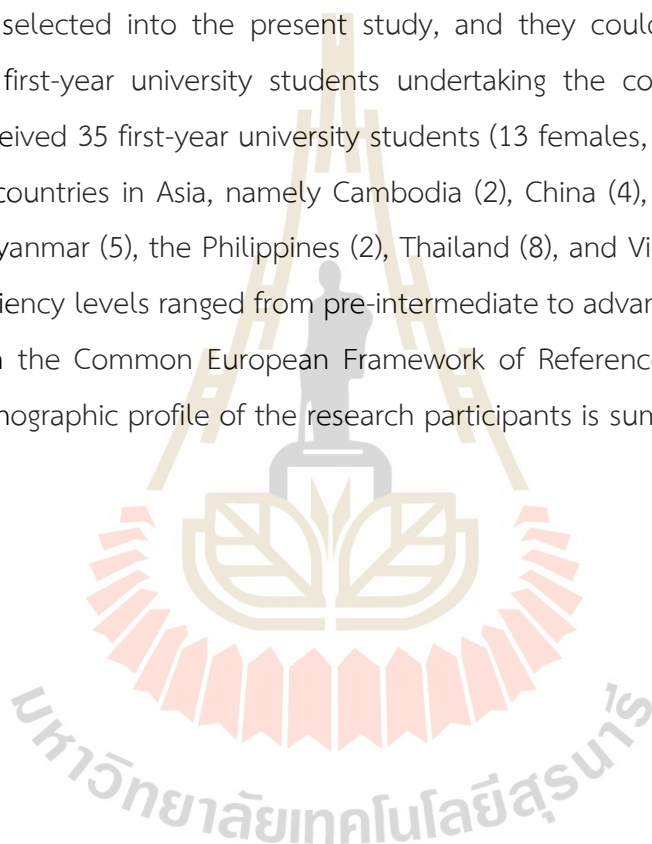


Table 3.1 Demographic Profile of the Participants

No	Pseudonym	Nationality	Gender	Home Language	English Proficiency	No. of years of learning English	Major of study	Experience of using Google Docs	Attitude towards CW (pre)	Attitude towards CW (post)	Influence of L1 in L2 writing
1	Sophea	Cambodia	F	Khmer	UPP	10	ACCT	N	NT	PS	NS
2	Sotear	Cambodia	F	Khmer	INT	11	EDU	N	PS	PS	Y
3	Joel	Filipino	M	Tagalog	UPP	12	PUB	N	NT	NT	Y
4	Thana	Thai	M	Thai	INT	10	THE	N	NT	NT	Y
5	Daniel Zim	Malaysian	M	Malay	INT	13	CIS	N	NT	NT	Y
6	Ming Jie	Chinese	F	Mandarin	INT	10	CIS	N	NT	PS	Y
7	Paw Eah	Myanmar	F	Karen	UPP	13	EDU	N	PS	PS	Y
8	Aung Win	Myanmar	M	Myanmar	INN	10	EDU	N	NT	PS	NS
9	Naw Joy	Myanmar	F	Karen	INN	10	EDU	N	PS	PS	Y
10	Tommy	Malaysian	M	Malay	UPP	15	ACCT	N	NT	NT	Y
11	Li Chun	Chinese	F	Mandarin	PRE	13	EDU	N	PS	PS	Y
12	Phuch Vu	Vietnamese	M	Vietnamese	PRE	8	MNG	N	PS	PS	Y
13	Saw Bochit	Myanmar	M	Myanmar	UPP	14	EDU	N	NT	PS	Y
14	Tranh Vy	Vietnamese	F	Vietnamese	PRE	8	ENG	N	NT	PS	Y
15	Sunny	Indian	M	English	ADV	15	ACCT	N	NT	PS	N
16	Raimonds	Indonesian	M	Indonesian	INT	12	MNG	N	PS	PS	NS
17	Jessy	Filipino	M	Tagalog	UPP	10	ACCT	Y	NT	PS	NS
18	Troy	Indonesian	M	Indonesian	ADV	15	MNG	N	NG	NT	N
19	Den	Malaysian	M	Malay	ADV	15	CIS	Y	PS	PS	N
20	Danudet	Thai	M	Thai	PRE	8	THE	N	PS	PS	Y
21	Fan Zhang	Taiwanese	M	Mandarin	INT	10	CIS	N	NT	NT	NS
22	Riah	Indonesian	F	Indonesian	PRE	10	EDU	N	PS	PS	Y

Table 3.1 Demographic Profile of the Participants (continued)

No	Pseudonym	Nationality	Gender	Home Language	English Proficiency	No. of years of learning English	Major of study	Experience of using Google Docs	Attitude towards CW (pre)	Attitude towards CW (post)	Influence of L1 in L2 writing
23	Krist	Thai	M	Thai	INT	10	CIS	N	NT	NT	NS
24	Zhu Lue	Chinese	F	Mandarin	INT	13	ACCT	N	NT	PS	Y
25	Rajani	Indian	F	Hindi	UPP	12	EDU	N	PS	NT	N
26	Eddy Chan	Malaysian	M	Chinese	PRE	11	ACCT	N	NT	NT	Y
27	Jaisin	Thai	M	Thai	INT	10	ACCT	N	NT	NT	Y
28	Sanit	Thai	M	Thai	PRE	10	ENG	N	NT	PS	Y
29	Fadri	Indonesian	M	Indonesian	INT	8	CIS	N	PS	PS	NS
30	Preeyanut	Thai	F	Thai	INT	10	ENG	Y	PS	PS	Y
31	Bella	Malaysian	F	Malay	UPP	12	EDU	Y	NT	PS	Y
32	Lina	Malaysian	F	Tamil	UPP	10	ENG	N	NT	PS	NS
33	Myo Win	Myanmar	M	Myanmar	INT	12	ACCT	N	PS	NT	Y
34	Poramin	Thai	M	Thai	PRE	10	THE	Y	PS	PS	Y
35	Apirak	Thai	M	Thai	PRE	8	THE	N	NT	PS	Y

* Gender:M = MaleF = Female

English Proficiency: PRE = Pre-intermediate; INT = Intermediate; UPP = Upper-intermediate; ADV = Advanced

Major of Study: ACCT = Account; CIS = Computer Information System; EDU = Education; ENG = English;

MNG = Management; PUB = Public Health; RES = Religious Studies

Experience of using Google Docs:N = NoY = Yes

Attitude towards collaborative writing (pre-and post-task): NG = NegativeNT = NeutralPS = Positive

Influence of L1 in L2 writing:NS = Not sureN = NoY = Yes

The participants came from diverse cultural backgrounds speaking different native tongues, but all of them had learned English as their foreign or second language ranging from 8-15 years in primary and secondary schools. In the English composition I, they were teamed up in small groups of three to four members. The researcher allowed the participants to form their own team, but with a condition that each small group must have at least one member from a different nationality. There were eleven small groups in total (nine groups consisted of three members each and two groups had four members). A reason for forming a small group of three to four members has been recommended and proven to be more effective in team collaboration and reducing chance of members' slacking off from group work compared to a large group collaboration in which the members are likely dependent on others' ideas (Dobao, 2012; Wang, 2019). The following section discusses variables of the study.

3.4 Variables

To achieve the research objectives, the researcher set two kinds of variables in the present study to be explored: (a) independent variable consisted of teaching method (WBCW lesson plans); and (2) dependent variables that included writing performance (pre-test and post-test score comparison to measure learners' writing improvement) and participants' perceptions toward WBCW in GD (from post-task questionnaire survey and interviews).

3.5 Instruments

The study employed two main types of instruments to obtain both quantitative and qualitative data and to achieve the research objectives. The two major types of instruments are discussed in the following subsections.

3.5.1 Instructional Instruments

The instructional instruments consist of two CW lesson plans and two CW tasks in GD (writing descriptive and argumentative essays), that were constructed based on the

sociocultural theory. A nexus of sociocultural theory claims, “full cognitive development requires social interaction” (Pritchard & Woollard, 2010, p. 35). Additionally, the CW lesson plans were designed to serve the current study’s objectives to expand the existing body of knowledge of WBCW in a multilingual English language classroom, while the CW tasks assisted the researcher to explore learners’ interaction patterns and CW styles on the web-based writing tool. Detailed information of CW lesson plans and CW tasks in GD is discussed in the following subsections.

3.5.1.1 CW Lesson Plans

The first instructional instrument used was constructed in the form of CW lesson plans. The purpose of constructing two CW lesson plans was to help guide the researcher to achieve the research objectives by engaging learners in the CW tasks. The collaborative activities include drill and practice on freewriting in GD, small group discussion, interaction with cloud-based content, peer feedback, and reflection. Prior to constructing the lesson plans, the researcher studied the nature of the English composition course offered by the FAH and checked the requirements mandated in the course description and the course objectives to be achieved. The course description covers descriptive, cause-effect, comparison and contrast, expository, and argumentative essays in which learners learned to compose these different types of essays. They used the four principles of unity, support, coherence, and sentence skills as defined in the college writing textbook entitled “*College Writing Skills with Readings*” by Langan & Albright (2019).

In response to the research objectives and questions, the researcher carefully constructed two collaborative lesson plans consisting of descriptive and argumentative essays by using GD as the collaboration platform. A significant reason for choosing these two types of essays is a descriptive essay has distinctive characteristics that learners employ rich adjectives to draw sensory details and vivid impression to readers, and it is perceived to be one of the easiest forms of academic writing. An argumentative essay writing, on the other hand, is one of the most difficult academic writings in which requires a writer to raise a debatable issue, state a point of view and defend those claims

with rationale and evidence (Schneer, 2014; Wingate, 2012) to persuade readers. The researcher selected these two writing genres (the least challenging at the beginning of the semester vs the most challenging at the end of the semester) to explore members in small groups interacted with each other while performing group work. The lesson plans were constructed based on the theoretical concepts driven by sociocultural theory, which posits that cognitive development derives from external factors such as cultural, social interaction, or collaboration with others in the learning community. Two textbooks were used to guide the researcher in designing the two lesson plans: *Great Writing 5: From Great Essay to Research* (5th edition) by Folse & Pugh (2019), and *College Writing Skills with Reading* (10th edition) by Langan & Albright (2019). Three model essays of description (e.g., “The Best Pizza in Town”, “How to Eat a Guava”, and “Family Portrait”) from the textbooks were studied to familiarize learners with descriptive writing genre. Likewise, three other model essays of argument from these textbooks (e.g., “The Best Classroom”, “Teenagers and Jobs”, and “Once over Lightly: Local TV News” were reviewed and analyzed to guide learners to construct their group argumentative essays. The procedure of constructing CW lesson plans is demonstrated in Figure 3.3.

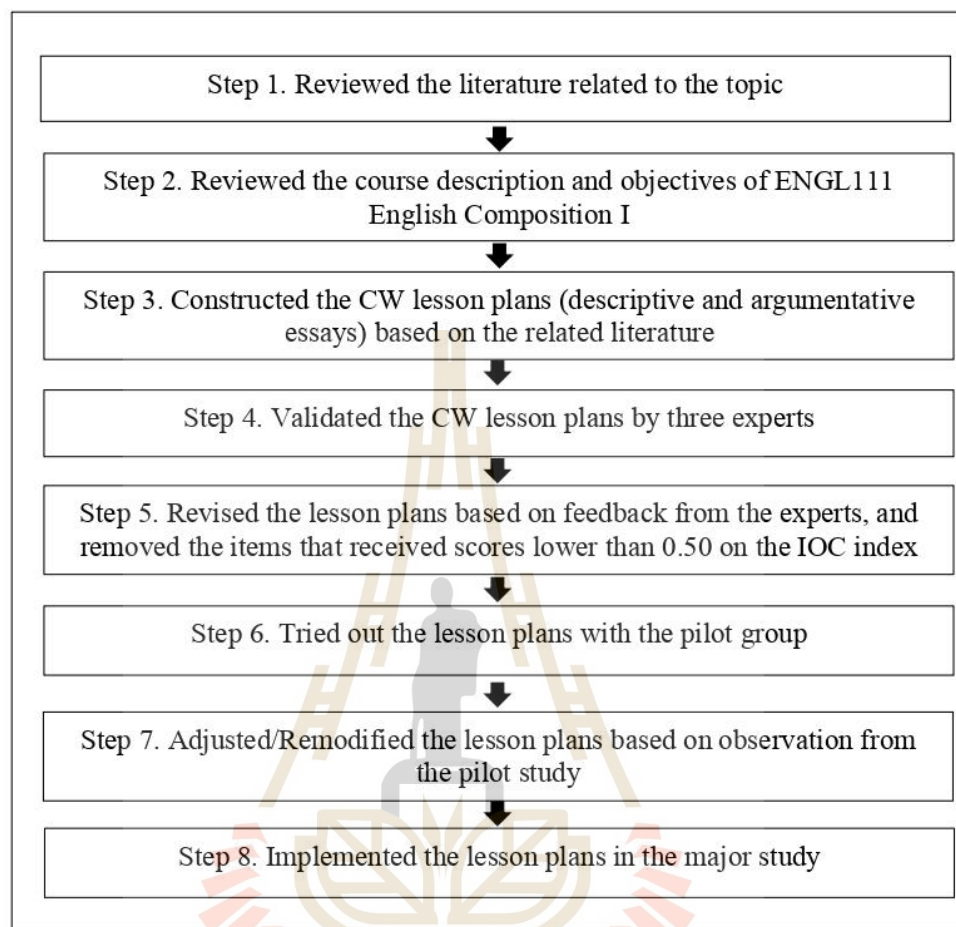


Figure 3.3 Procedure for Constructing CW Lesson Plans

The CW lessons were driven by sociocultural orientation and the conceptual framework integrated into the CW lessons can be demonstrated in Figure 3.4.

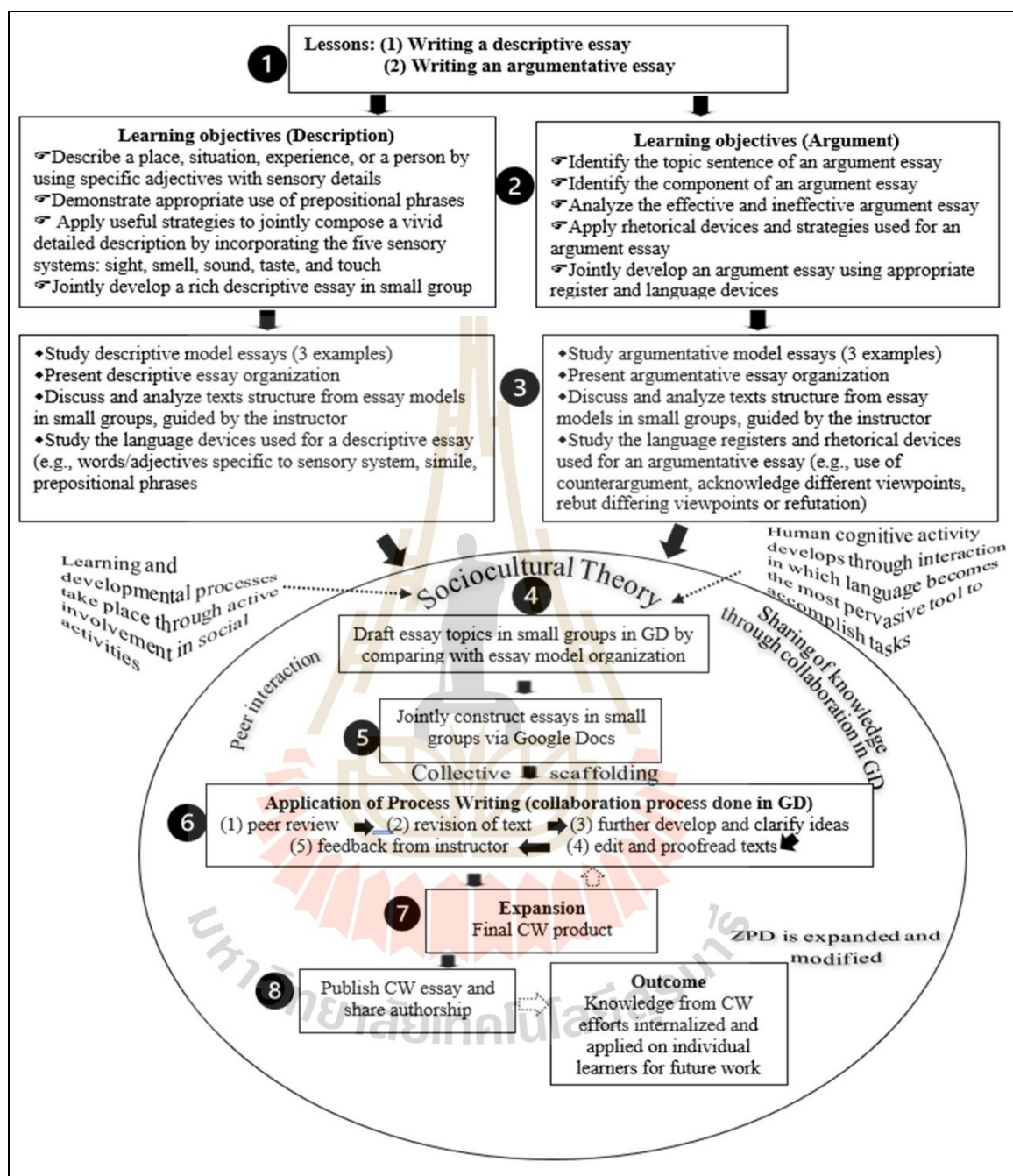


Figure 3.4 Conceptual Framework of Sociocultural Theory Integrated in CW Lessons

As seen in Figure 3.4, learners' objectives were defined (see number 2), and the instructor directed them to learn model essays for each genre of writing. Learners discussed and analyzed text structure from essay models in small groups while guided by

the instructor. Language registers and rhetorical devices were emphasized when essay models were introduced (see number 3). After essay models were taught and learned, learners in small groups started drafting their essay in a GD file created by the instructor (see number 4). From this stage onwards, we can perceive that the notion of sociocultural perspectives come into play and navigate the CW process when learners in small groups interacted, shared linguistic resources, and scaffolded each other to jointly construct knowledge. When their first rough draft of essay was completed, learners were directed to put their paper through writing process steps (see number 6). During this writing process, the instructor intervened in the group writing process by providing comments and feedback to further improve the quality of work. Through the stages of writing process, learners interacted, negotiated, and collectively scaffolded one another and better understanding was forged out through collaborative efforts. Then, the team could expand on their final draft (number 7) and at this final stage, they might get the essay proofread one more time as shown by the reverse dotted arrow. When the team members were satisfied and all agreed with their quality of writing, they published the essay and shared co-authorship (see number 8). The final outcome of the CW process underpinned by the sociocultural theory was individual learners, in particular less able students who were scaffolded by high-ability partners, would develop tacit knowledge through the process called internalization (Lantolf and Thorne, 2007) for future reference.

3.5.1.2 CW Tasks in GD

The second instructional instrument used was CW tasks in GD. The researcher created a document in GD template for each group and sent members a link to login the file for each task. The objective of creating CW tasks in GD files was to explore members from each group's interactions while attempting to complete tasks. In GD files, member commented and edited texts contributed by their peers freely. The researcher proposed four collaborative descriptive essay topics for each group to select one. The descriptive essay topics are such as describing your university, describing an unforgettable event, describing your favorite place, and describing vegetarian dishes at the university canteen. Likewise, the researcher proposed the other four collaborative argumentative

essay topics: Should curfews be imposed on campus?, Is college education necessary?, Should college students have part-time jobs while they study?, and Should non-vegetarian dishes be served in the university canteen? for each group to choose one. A reason for listing four optional essay topics for each writing genre was to offer learners some choices about writing of familiar topics, so they would not feel too restricted. Furthermore, from the researcher's perspective a few optional topics may produce a greater variety of richer data for analysis concerning interaction patterns and collaborative styles. These two CW tasks accounted for 10% of their final score (5% for each writing task). The procedure for constructing CW tasks in GD is illustrated in Figure 3.5.

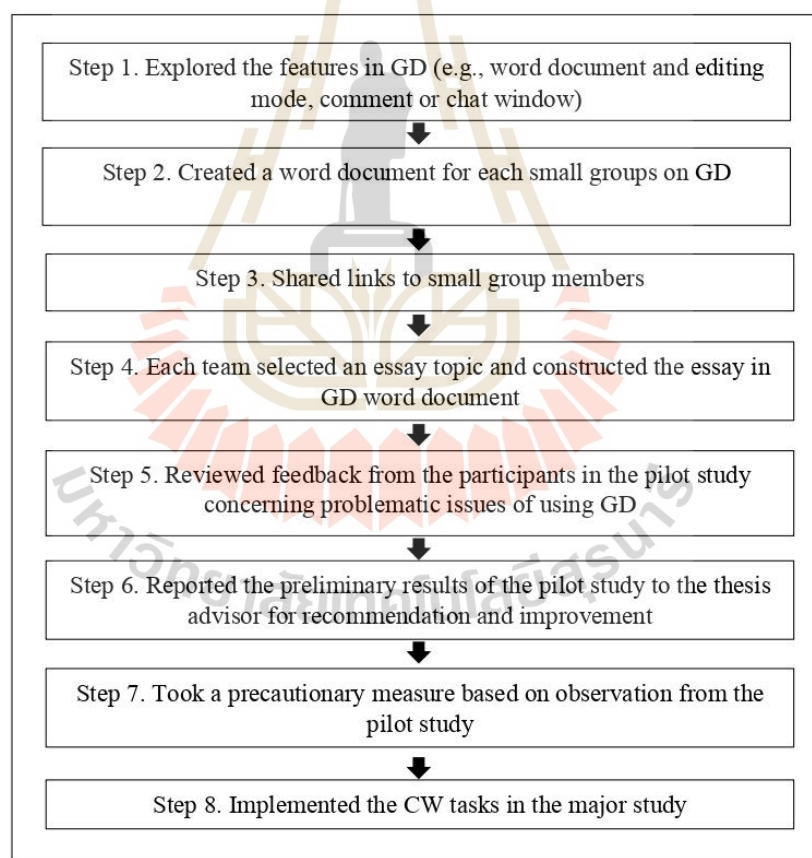


Figure 3.5 Procedure for Constructing CW Tasks in GD

The researcher created Word files in GD for each small group. A screenshot of creating CW groups is displayed in Figure 3.6.

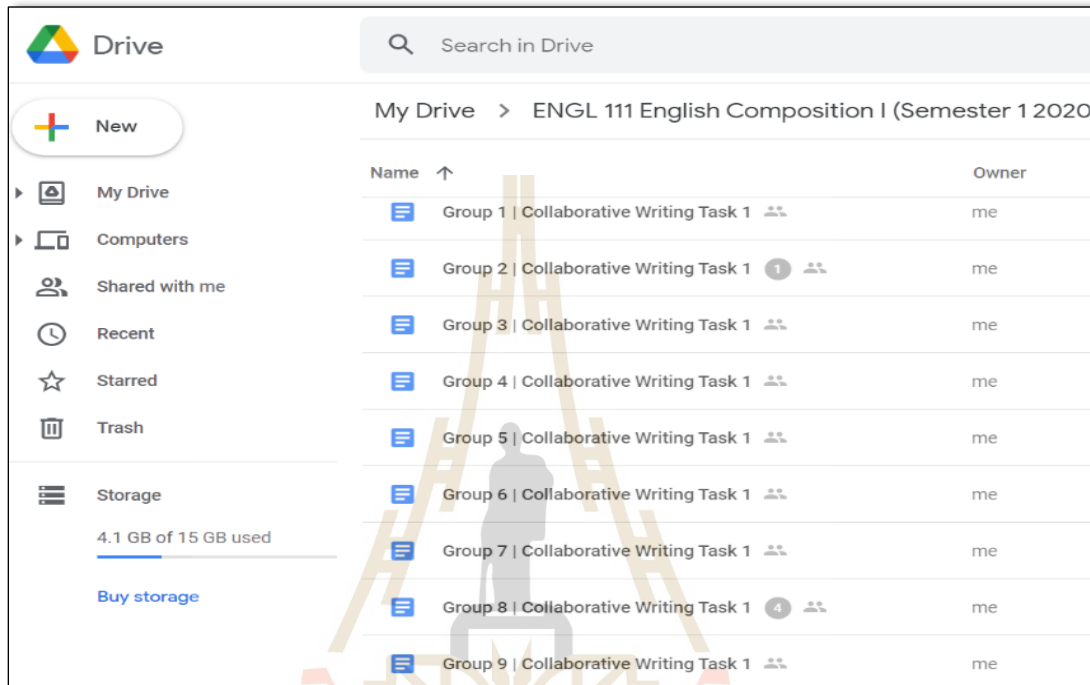


Figure 3.6 A Screenshot of CW Groups in Google Drive

Each group was informed that their collaboration in GD could be viewed by the researcher at any time. In other words, the researcher's role was an observer as participant. The researcher in this study may interact with the participants to establish rapport, but would not become fully involved in the behaviours and activities of the group (Lincoln & Guba, 1985). In other words, the researcher would observe and interact with group members to "establish an insider's identity without participating in those activities constituting the core of group membership" (Adler & Adler, 1998, p. 85). A screenshot of a share link to collaborators is displayed in Figure 3.7.

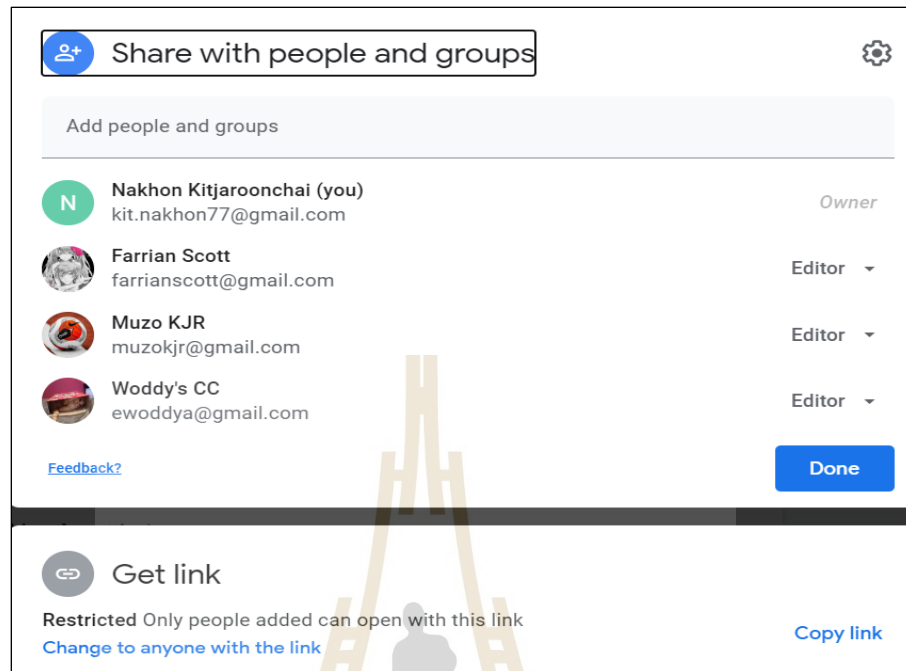


Figure 3.7 A Screenshot of Sharing Settings to Collaborators

As seen (Figure 3.7), the researcher shared the link to three members. Each member could edit work freely in the GD file. GD has similar features as Microsoft Word Processing. It has a tool bar that runs across the top of the file that allows collaborators to navigate the shared file easily. Additionally, GD provides a timeline feature that illustrates what being edited over the past version. The team members can revert to a previous version to observe changes at any time. Furthermore, the collaborators do not need to worry about losing the file for all texts entered are saved automatically every time a member edits or makes a change. In this present study, learners from each small group only needed some basic word-processing functions such as buttons in GD toolbar that include collaboration features like comment or chat window, and editing mode. The menu functions and features in GD is shown in Figure 3.8.

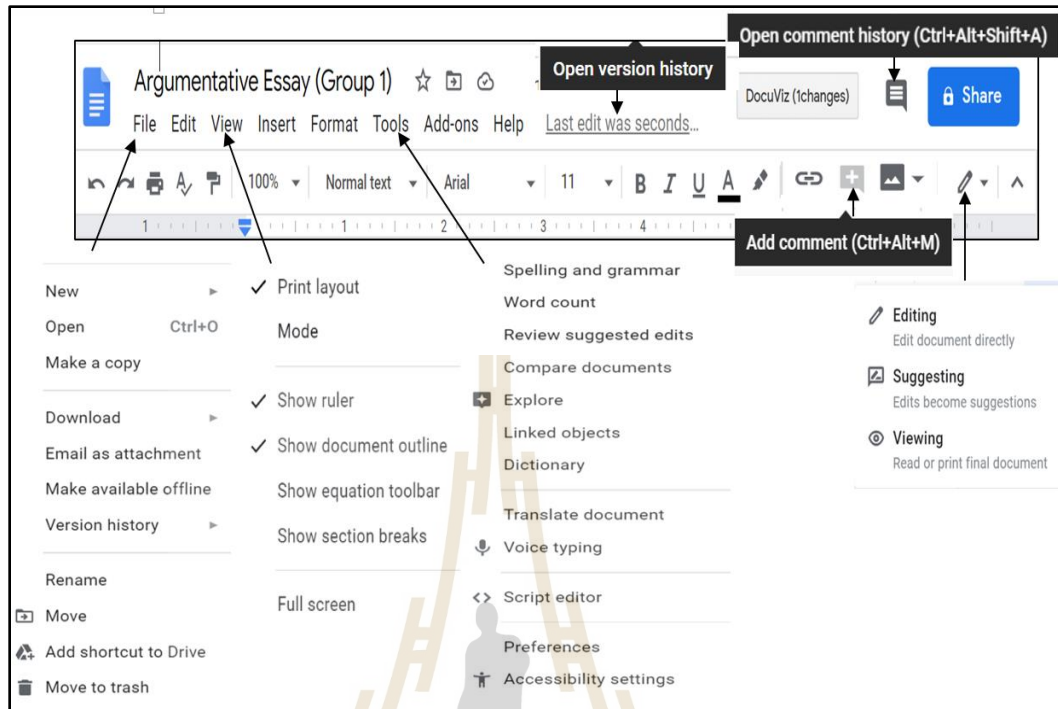


Figure 3.8 A Screenshot of Features in GD Toolbar

As seen (Figure 3.8), GD provides identical features like Microsoft Word does. Collaborators can type, change, format, delete, and edit their work and make use of those basic formatting features the same manner they work in word processor. However, GD has greater collaboration features in that the team members can share the file, edit, comment, or chat with each other while performing a task in real time. Figure 3.9 shows simultaneous writing when members in a small group performed a real-time collaboration.

Three members collaborating synchronously on their argument essay

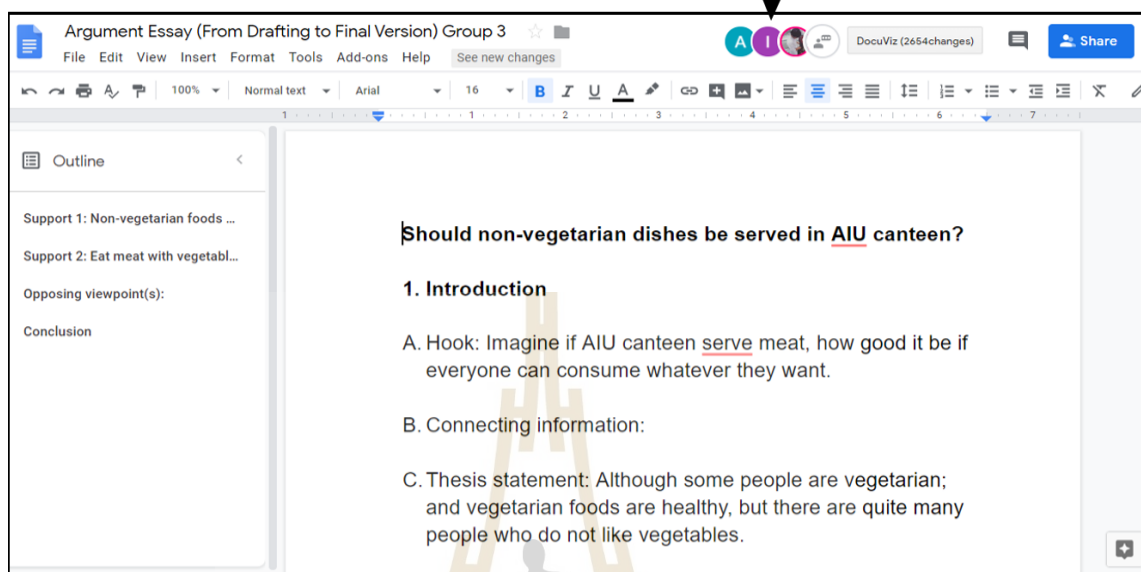


Figure 3.9 A Screenshot of Synchronous Collaboration in GD

As seen, the instructional methods using GD as a CW platform helped stimulate learners in small groups to engage in knowledge construction. They discussed and applied cognitive strategies in the learning process, such as questioning, outlining the plan, co-constructing texts, reviewing and revising co-constructed texts, and publishing work as a group. The activities provide chances for learners to expand their ZPD in that they gradually absorb more understanding through collaboration (Muniyappan & Sivakumar, 2018). The instructional methods built on the principles of sociocultural theory encourage team collaboration, promote discussion, emphasize collaborative problem solving, and shape knowledge constructed by team members (Muniyappan & Sivakumar, 2018). Learners employed the language as the primary means for mediation and verbal communication while engaging in CW tasks. The sociocultural theory posits that language is a significant tool that learners utilize to create knowledge, discover ideas, and improve cognitive ability. In addition to instructional instruments, the researcher employed other research instruments that are explained in the following subsection.

3.5.2 Research Instruments

Aside from the instructional instruments, the study used other research instruments including pre- and post-test writings, pre- and post-task questionnaires, student reflective journals, and semi-structured interviews. Additionally, the two CW tasks (writing descriptive and argumentative essays) used for the instructional instrument also serve as the research instrument. The detailed information of the research instruments is discussed as follows.

3.5.2.1 Pre-test and Post-test Writing

The identical topic of an argumentative essay was employed before and after the intervention with an objective to investigate if involvement in the CW tasks yield any positive effects on learners' writing performance. The essay topic for pre- and post-test was taken from the 2019 International English Language Testing System (IELTS) practice essay questions (<https://ieltsliz.com/100-ielts-essay-questions/>). Reasons for choosing IELTS essay topics are:

1. IELTS essay topics expect high school graduates who enter college to be familiar with an academic writing style and a variety of topics typically used in academic settings.
2. IELTS essay topics are appropriate for first year undergraduate students since the topics share universal themes that are applicable to all disciplines. In other words, topics are unbiased to a specific area of study, so learners with cultural differences from all academic disciplines can understand those topics.
3. The IELTS writing test is one of the most widely used large-scale tests administered to ESL/EFL learners in over 120 countries worldwide, which has been proven to have validity and reliability (Uysal, 2010).
4. The IELTS writing test is used as one of the criteria to screen international applicants, as well as Thai students, who are enrolled in International Bachelor's Degree Programs at AIU.

In this present study, the researcher followed four steps involved in selecting the essay topic used for the pre- and post-test:

1. The researcher consulted the program chair and the English composition instructor of the Faculty of Arts and Humanities at AIU who oversee the course for comments and recommendations pertaining to employing IELTS essay topics for the study.

2. A needs assessment survey was carried out, outlining various topics from different academic disciplines.

3. The most selected academic discipline was chosen from the participants. The theme on education was that most chosen by the group.

4. Six subheadings listed under education were shortlisted from IELTS essay questions associated with academic and social life. The most chosen essay topic was used for the pre- and post-test (*All levels of education, from primary school to university education, should be free of charge*).

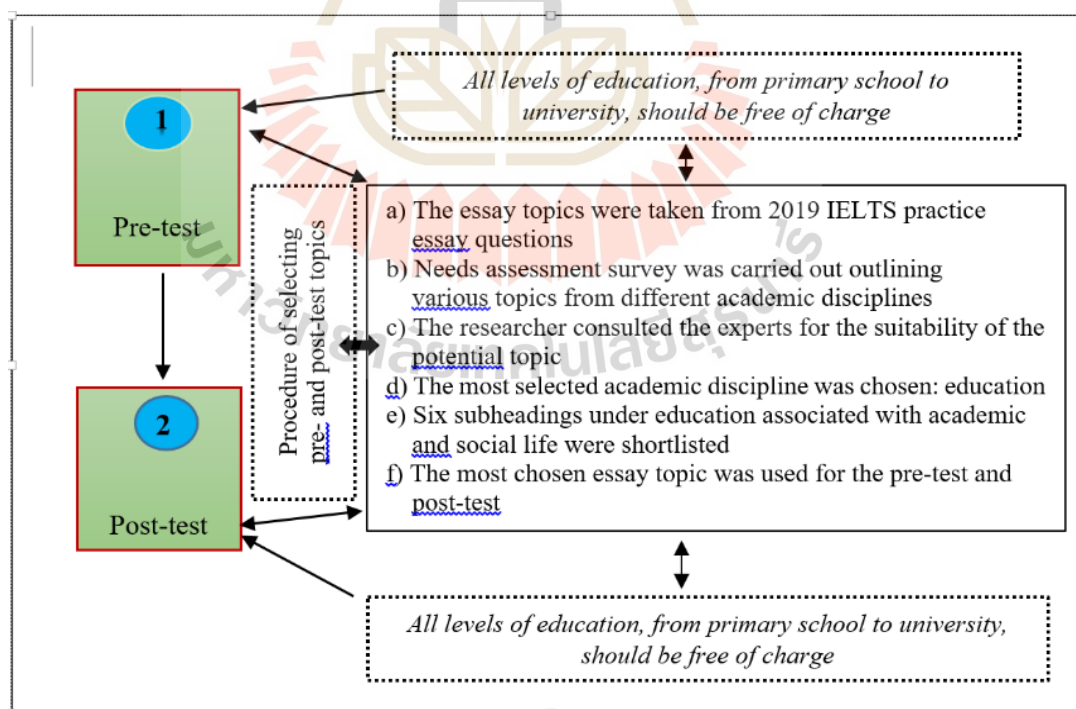


Figure 3.10 Procedure for Selecting Pre-test and Post-test Essay Topic

Learners were required to compose an argumentative essay (pre-test) using Microsoft Word in the language laboratory (no internet access) during the second week of research implementation and submitted their pre-test through the learning management system (LMS Moodle). They were required to write a 400 to 500-word essay within 70 minutes. Likewise, the post-test was administered in the same protocol as the pre-test in week 12th. Both the pre- and post-test were piloted with the tryout group of 17 participants prior to the main study. The pre- and post-test topic was assessed and validated by three experts in terms of its usefulness, which included construct validity and practicality. That is, it reflected the goals of academic writing required in the English composition (construct validity) and it could measure learners' writing achievement (practicality) (Weigle, 2002). Jacob et al.'s (1981) Composition Analytic Scoring Rubric was used to assess the learners' pre- and post-test writing performance (see Appendix D). The procedure for selecting the pre- and post-test essay topic for the study is shown in Figure 3.10.

3.5.2.2 Pre-task and Post-task Questionnaires

In this study, the researcher adopted and extensively modified the pre-task questionnaire (see Appendix F) and the post-task questionnaire (see Appendix G) initially developed by Li (2014) to suit the present study context. The main objective of employing the pre-task questionnaire was to obtain background information about the participants such as gender, age, nationality, major of study, and number of years of learning English, prior experience in CW tasks, prior experience in using GD, and attitude toward group work. The participant's demographic data served as general data. Some of the information was used for further analysis, for example, the participant's perception of working in small groups prior to participating in the study, or the participant's attitude toward CW activities. These items were used to compare with the results obtained from the post-task questionnaire that addresses similar issues. The post-task questionnaire consists of 21 items with a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), along with five short-answer questions. The post-task questionnaire survey aims to explore learners' perceptions of their WBCW experiences. The questionnaire items 1 to 4

are related to participants' general experience in using GD for CW tasks. Items 5 to 11 discuss participants' perceptions of using GD in relation to writing improvement. Items 12 to 17 address participants' perceptions of group interactions in the CW tasks. Items 18-21 involve with participants' perceptions of DocuViz embedded in GD, which raises awareness of member participation. The short-answer questions are open-ended questions that required research participants to express their thoughts about the advantages and disadvantages of CW tasks in GD, and how they like or dislike about group work. The participants were required to describe their role in group writing tasks and their overall impression of CW tasks. The procedure of developing and constructing the pre-task and post-task questionnaires is shown in Figure 3.11.

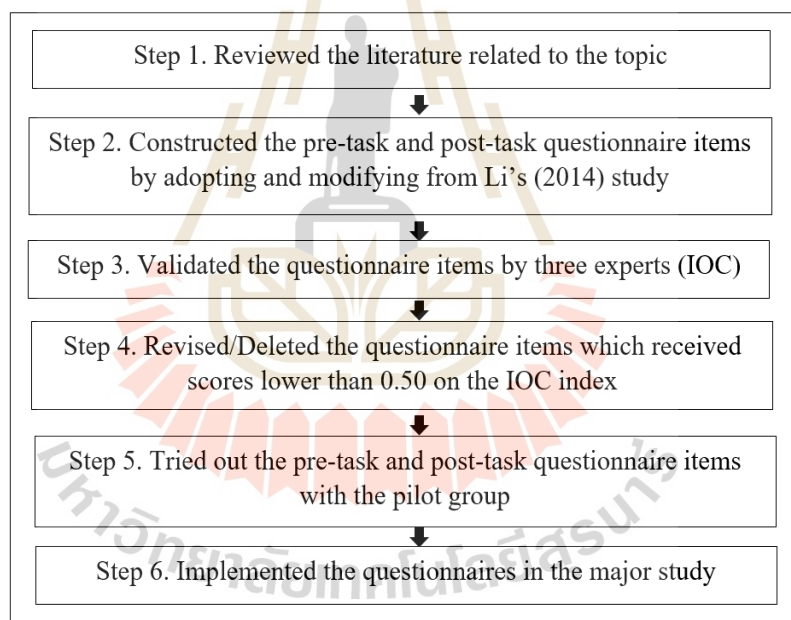


Figure 3.11 Procedure for Developing and Constructing the Questionnaires

3.5.2.3 Reflective Journal

This present study required the participants to produce reflective journals, which is a common practice in a qualitative study (Ortlipp, 2008). The purpose of employing reflective journals was to assist the researcher in finding out the participants' feelings, opinions, thoughts, and reactions that are invisible to survey questionnaires or

group participation while they were engaged in the CW tasks. Reflective journals are perceived to be useful for data triangulation in that they can establish corroborating evidence and enrich understanding of answers to research questions (Salkind, 2010). They can also make the research process more transparent to the researcher, who can then make the findings and discussion more visible to interested audience (Ortlipp, 2008). Reflective journals permit learners to reflect on their learning process more analytically for either negative or positive experiences.

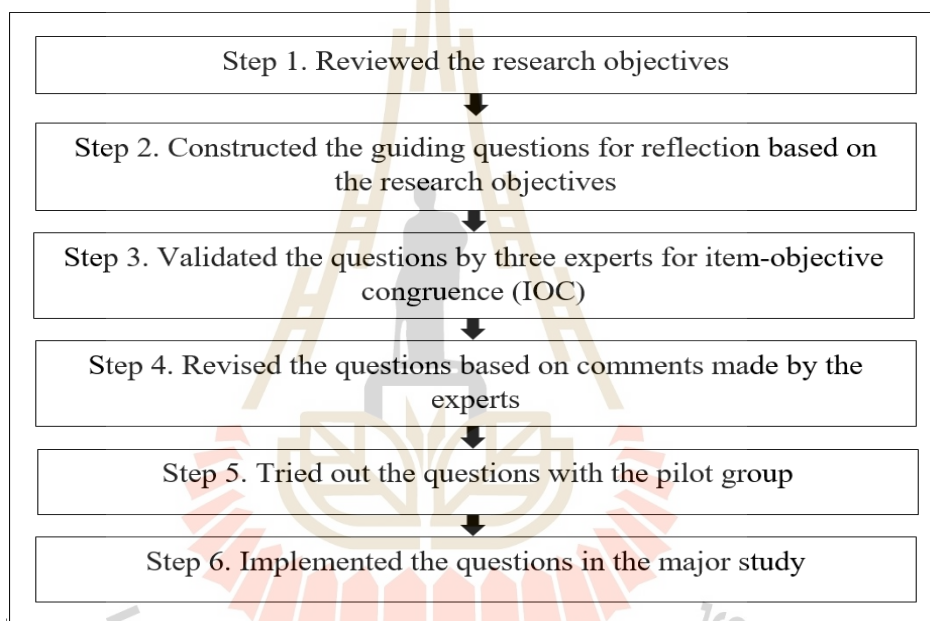


Figure 3.12 Procedure for Constructing the Guiding Questions for Reflection

In this study, each participant was required to write two reflective journal entries: the first reflection was submitted in week 7, and the second one was handed in during week 12. The researcher constructed six guiding questions to assist the participants in reflecting on their CW tasks experience (see Appendix N). The procedure of constructing the guiding questions for reflection is shown in Figure 3.12.

3.5.2.4 Semi-structured Interviews

The researcher interviewed 12 participants selected from the subcases (small groups) in weeks 13 to 14 of the study. These 12 participants were chosen based on three criteria: (1) all three members came from diverse cultural backgrounds, (2) members in the group were varied in English language proficiency, and (3) at least two members were off-campus during the time of data collection due to the COVID-19 pandemic situation. The purpose of using semi-structured interviews was to allow the researcher to gather richer information, collect new and exploratory data concerning the participants' attitudes, beliefs, or perceptions toward WBCW experiences in GD. The qualitative data obtained from the semi-structured interviews helped triangulate data sources and validated the research findings. Prior to conducting the interviews, the researcher carefully explained to the participants about the need for informed written consent before asking them to sign, affirming that they clearly understood the main objective of the interview. The participants were notified that their voices would be recorded and the data used for research purposes only. Their identities were kept confidential, and the researcher used only pseudonyms in the research findings and discussion. The interviews were conducted either in a face-to-face mode, or via Zoom application based on the convenience and preference of each selected interviewee. The participants who chose in-person interviews during the time of data collection used private study rooms in the university library and the researcher's office as the interview venue, whereas those who gave online interviews were conducted via Zoom application. English was used during the entire semi-structured interviews. Each interview took approximately 30 minutes and it was recorded using a digital voice recorder and voice memo in an iPhone, and Zoom application for online interview. Once the interviews were completed, the researcher carefully transcribed them in Microsoft Word and checked the transcripts against the digital voice recordings and corrected any identified errors. The procedure for constructing the semi-structured interview questions is presented in Figure 3.13.

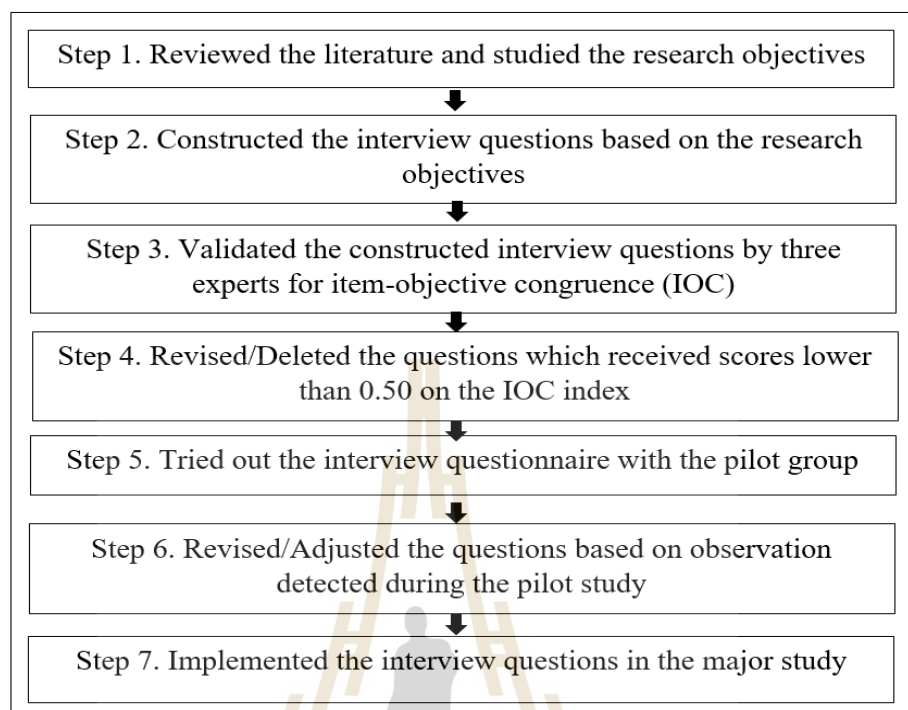


Figure 3.13 Procedure for Constructing the Interview Questions

3.6 Data Collection Procedure

To achieve the research objectives, the researcher collected both quantitative and qualitative data. Quantitative data were collected from the participants' pre- and post-test scores, frequent use of WCFs and LFs, partial information from the pre-task and the post-task questionnaire surveys. Qualitative data were collected from learners' engagement in two CW tasks, open-ended questions from the post-task questionnaire, reflective journals, and semi-structured interviews. The CW data set included the archived records of learners' discussions, comments, and other LFs for peer interactions retrieved from GD revision history.

Aside from investigating the effects of CW tasks on learners' writing performance, the study explored learners' CW in small groups and interaction patterns. The researcher carefully chose subgroups based on the criterion of maximum variations (Li, 2014, Li & Kim, 2016) to explain the phenomena and draw the conclusions. The chosen groups' CW

tasks and their interactions were discussed in Chapter 5. Furthermore, the semi-structured interviews and the reflective journal data set of learners in the chosen groups were analyzed and cross-checked for inter-rater reliability. A summary of research instruments and methods for each research question is presented in Table 3.2.

Table 3.2. Summary of Research Instruments Used in the Study

Research Questions	Quantitative Instruments Used	Qualitative Instruments Used
RQ 1. Do collaborative writing tasks help to improve learners' writing performance in an argument essay? If so, how?	Pre-test and post-test writing	-
RQ 2. What patterns of interaction occur when learners engage in collaborative writing tasks via Google Docs?	Two CW tasks in GD: descriptive and argumentative essays	Two CW tasks in GD: descriptive and argumentative essays.
RQ 3. What are the writing change functions and language functions used in collaborative writing when learners are engaged in writing tasks?	Two CW tasks in GD: descriptive and argumentative essays	Two CW tasks in GD: descriptive and argumentative essays.
RQ 4. What are the learners' perceptions of the web-based collaborative writing experiences in Google Docs?	Pre-task and post-task survey questionnaires	Post-task questionnaire on open-ended questions; Reflective journals; Semi-structured interviews

The present study was conducted for a span of 14 weeks or one academic semester using various types of instruments as previously discussed. A planned schedule of data collection is summarized in Table 3.3.

Table 3.3 Planned Schedule for Data Collection

Quantitative Instruments	Qualitative Instruments	Year	Month	Week	Time Span
■Pre-test writing		2020	August	2	70 mins
	■Pre-task questionnaire			2	20 mins
	■ Collaborative Writing 1	2020	September	4-7	4 weeks
	■ Reflective Journal 1			7	within week 7
	■ Collaborative Writing 2	2020	October	8-11	4 weeks
	■ Reflective Journal 2			12	within week 12
■Post-test writing				12	70 mins
	■Post-task questionnaire	2020	November	12	30 mins
	■ Semi-structured interviews			13-14	30 mins/person

Note: Pre-task and post-task questionnaires contain both quantitative and qualitative data

3.7 Data Analysis

The researcher organized both quantitative and qualitative data into types based on the source of information. The analysis of the data set generated from various sources is explained in the following subsections.

3.7.1 Analysis of Quantitative Data

The quantitative data collected in this study consisted of learners' pre-and post-test writing scores, frequency counts of WCFs and LFs employed by group members, and scores retrieved from the post-task questionnaire measuring learners' perceptions of CW experience in GD.

3.7.1.1 Learners' Pre-test and Post-test Scores

The learners' pre-test and post-test were assessed by three experts in the field of English language studies (see list of experts in Appendix R) using Jacob et al.'s (1981) Composition Analytic Scoring Rubric as a scoring guideline (see Appendix D). Three raters (researcher included) were used to increase the level of percentage agreement and interrater reliability. Learners' pre- and post-test scores were assessed for their inter-rater correlation coefficients. The average of the three raters' scores for pre- and post-test were

used for statistical analysis with a paired-sample *t*-test using IBM SPSS Statistics Version 20 to compare the learners' means scores and examine the differences in learners' writing performance after engaging in two CW tasks. This quantitative analysis addresses Research Question 1. The relationship of the pre-and post-test scores graded by three raters is reported in Table 3.4.

Table 3.4 Relationship of Scores Assessed by Three Raters in Pre-and Post-test

Raters	Pre-test			Raters	Post-test		
	Rater 1	Rater 2	Rater 3		Rater 1	Rater 2	Rater 3
Rater 1	—	.91*	.76*	Rater 1	—	.95*	.96*
Rater 2		—	.78*	Rater 2		—	.93*
Rater 3			—	Rater 3			—

* $p < .01$ (2 tailed)

The correlation coefficients (*r*) for the pre-test value ranged from .76 to .91 and the post-test value ranged from .93 to .96, which indicate a strong positive correlation in rating learners' pre-test and post-test writing across the three raters. Overall, these results reckon that scoring by three raters were consistent and thus reliable, yielding a high level of inter-rater reliability.

Aside from observing learners' increased scores in their post-test, the researcher adopted Lu's (2010) L2 syntactic complexity analyzer (L2SCA) to investigate changes in learners' post-test writing concerning syntactic complexity and language accuracy. In this research, only two types of syntactic complexity were employed, including length of production unit and sentence complexity. The length of production unit is measured through (1) mean length of clause (MLC), or number of words per clause, (2) mean length of sentence (MLS), or number of words per sentence, and (3) mean length of T-unit (MLT), or number of words per T-unit. For sentence complexity, it is gauged by

number of clauses per sentence. Whereas accuracy rate is measured by the ratio of error-free clauses and the percentage of error-free clauses to total clauses (Chuang, 2018).

3.7.1.2 CW Tasks in GD

Two CW tasks (descriptive and argumentative essays) in GD constructed by learners in small groups permitted the researcher to analyze data quantitatively using DocuViz to explore patterns of interaction by observing data from proportion of contribution while learners were engaged in CW tasks to address Research Question 2. Furthermore, the two CW tasks performed on the web-based writing tool allowed the researcher to examine the WCFs and LFs frequently used by each team member engaging in their tasks. This investigation addressed Research Question 3. The example of members' participation and contribution towards their CW tasks is illustrated in Table 3.5.

Table 3.5 Example of Members' Contributions towards CW Tasks

Group	Pseudonym	Login attempts		Edit of self (no. of characters)		Edit of other (no. of characters)		Total edit (no. of characters)		Proportion of contribution (no. of character)		Percentage of contribution to the final draft	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
1	Red	10	6	5,268	5,468	1,750	3,364	7,018	8,832	1,461	2,207	25.56	29.41
	Orange	7	6	8,155	8,122	4,787	1,941	12,942	10,063	2,321	3,034	40.60	40.43
	Green	7	4	8,220	7,153	7,056	772	15,276	7,925	1,934	2,263	33.84	30.16
	Blue	15	16	17,049	25,408	1,457	2,912	18,506	28,320	4,865	3,409	85.82	57.76
2	Green	7	12	1,087	3,366	129	277	1,216	3,643	357	601	6.30	10.19
	Orange	6	8	2,237	2,923	1,035	1,223	3,272	4,146	447	1,892	7.88	32.05

As seen in Table 3.5, the data analysis reveals members' frequent login attempts, their edit of self-text and other-text, total edit made by each member, and proportion of final contribution to group work (calculated by the number of characters). On the last two columns display percentage of contribution individuals made to their CW tasks 1 and 2.

Pertaining to WCFs and LFs (see definitions given in Chapter 2: Tables 2.3 and 2.4) employed by group members while engaging in CW tasks, the research analyzed written texts co-constructed by the group members in GD, scanned through GD revision history, and counted the frequency of use of each writing change or language act. The example of frequency of use of WCFs produced by group members is illustrated in Table 3.6.

Table 3.6 Frequency of Writing Change Functions Performed by Group Members

WCFs		Group A								Group A							
		Red		Green		Orange		Total		Blue		Green		Orange		Total	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Adding	Self	3	3	2	4	2	2	7	9	8	4	0	3	1	2	9	9
	Other	1	3	0	1	0	1	1	5	0	2	2	0	0	3	2	5
Correcting	Self	3	0	0	1	0	0	3	1	1	1	0	1	0	1	1	3
	Other	2	1	2	2	0	1	4	4	0	1	1	2	3	2	4	5
Deleting	Self	1	1	1	1	2	1	4	3	2	1	0	1	0	0	2	2
	Other	0	0	0	1	0	0	0	1	1	3	0	0	0	0	1	3
Reordering	Self	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1
	Other	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Rephrasing	Self	1	0	3	1	2	0	6	1	7	2	0	0	0	0	7	2
	Other	0	2	1	0	0	0	1	2	1	1	1	0	0	0	2	1
Total		11	11	9	11	6	5	26	27	20	17	4	7	4	8	28	32

* T1 = Task 1, T2 = Task 2

As seen (Table 3.6) members from each team employed varied WCFs and changes were made on self-text as well as other-text. These results indicate that members were engaged with peers' texts. Likewise, LFs were retrieved from the comment history recorded in the GD file. The frequency of use of LFs produced by group members are illustrated in Table 3.7.

Table 3.7 Frequency of Language Functions Performed by Group Members

Language Functions	Group 3						Group 4									
	Red		Green		Orange		Total		Blue		Green		Orange		Total	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Eliciting	0	2	0	0	0	0	0	2	1	1	0	0	0	0	1	1
Greeting	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Justifying	1	0	0	0	0	1	1	1	0	0	0	0	0	1	0	1
Initiating Questioning	0	1	0	0	0	1	0	2	0	1	0	1	0	1	0	3
Requesting	0	1	3	0	0	0	3	1	2	0	0	0	0	0	2	0
Stating	0	0	0	0	0	0	0	0	2	2	0	0	0	1	2	3
Suggesting	3	2	0	0	3	0	6	2	0	1	0	4	0	2	0	7
Acknowledging	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0
Responding Agreeing	1	0	1	2	2	0	4	2	0	4	1	1	0	1	1	6
Disagreeing	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Elaborating	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1
Total	5	7	4	5	5	2	14	14	5	11	1	6	0	6	6	23

3.7.1.3 The Post-task Questionnaire

The post-task questionnaire with Likert rating scales was analyzed quantitatively using percentages and mean scores. The researcher adopted the interpreting procedure of mean scores initially developed by Chaiwiwatrakul (2015). The data analysis from the post-task questionnaire addressed Research Question 4. The interpretation of mean scores for learners' perception of WBCW experience in GD is defined in Table 3.8.

Table 3.8 Interpretation of Mean Scores for Learners' Perception

Means	Interpretation
4.50 – 5.00	Learners reported having a "very high" level of perception on the statement given.
3.50-4.49	Learners reported having a "high" level of perception on the statement given.
2.50-3.49	Learners reported having a "moderate" level of perception on the statement given.
1.50-2.49	Learners reported having a "low" level of perception on the statement given.
1.00-1.49	Learners reported having a "very low" level of perception on the statement given.

3.7.2 Analysis of Qualitative Data

Qualitative data are those collected in a non-numerical form to gain insights of topic being investigated (Creswell, 2012). The qualitative data collected consisted of semi-structured interviews, student reflective journals, and open-ended questions from the post-task questionnaire. The qualitative data collected from various sources would enhance the researcher's understanding of the phenomena being investigated as well as validate data and increase confidence in drawing trustworthy conclusions. For the semi-structured interviews, the researcher purposely chose twelve participants for interviews, and then transcribed and analyzed the participant interview scripts qualitatively using content analysis. The qualitative data from the interviews were analyzed and interpreted through four phases: data preparation, open coding, recoding, and meaning categorization to generate emerging themes. The detailed information of the four phases used for content analysis of interview data is described as follows.

Phase I. Data Preparation

Data preparation involved transcribing data and initial reading. At this phase, the researcher transcribed the recorded interviews from spoken words in written texts. Then the researcher started an initial reading to familiarize himself with the transcribed data before dividing it into parts. The main aim of data preparation was to assist the researcher in text preparation for constructing an open coding system. The researcher spent six weeks to complete data preparation in organizing the materials. Followed phase I, the researcher started an open coding system.

Phase II. Open Coding

Open coding is the process of segregating and marking texts to form descriptions in the qualitative data (Creswell, 2012). At this phase, the researcher read and reread all the transcripts attentively several times and labeled the segments with codes, examined codes for redundancy. The open coding process assisted the researcher in disregarding other data that did not address issues being investigated, but rather identifying key

segments, concepts, and themes. The researcher spent four weeks to complete the open coding stage prior to performing the recoding of data.

Phase III. Recoding

In the recoding phase, the researcher grouped similar codes and identified redundant codes to reduce them to a more locatable and manageable number. The researcher further reevaluated the data by equating them with the ongoing coding system and took notes of any new emerging themes. The recoding system assisted the researcher to look for emerging themes related to the underlying assumptions of learners' perceptions toward collaborative writing experiences in GD. At the end of the recoding phase, an exclusive system of categories was created. The recoding process lasted for two weeks.

Phase IV. Meaning Categorization and Emerging Themes

In this last phase of qualitative content analysis, categories or themes were identified pertaining to learners' perception on collaborative writing experiences in GD. The findings are presented in Chapter 4.

Concerning the data analysis of student reflective journals and open-ended questions from the post-task questionnaire, similar topics found in the semi-structured interview questions were used to reaffirm their underlying perception towards the CW experiences. The topics provided for learners to reflect upon include (1) advantages and disadvantages of CW tasks in GD, (2) overall impression or dissatisfaction of CW task in GD, (3) role or responsibility in group work, and (4) personal goals while engaging in group work. Data collected from student reflections and open-ended questions were coded and recoded in the same manner as the interview data. These three data sources were collapsed and merged into one sizable source. Example of data coding and meaning categorization are shown in Table 3.9.

Table 3.9 Example of Data Coding and Meaning Categorization of the Interviews and Student Reflections

Themes	Categorization	Examples
Advantages of CW		If we divide responsibility, we can feel lighter to do the work because others can do their parts, so we don't do everything alone. (ST2-Interview)
	Accelerating work process	Collaborative writing can lighten workload when the essay is long, and your teacher expects you to submit within a time frame when you also have other projects to do (ST3-Interview) When we have a good plan to do our group writing, we can finish the work easily because we don't feel too much pressure on the workloads. (ST15-Reflection) I would say group work can speed up your assignment and you can complete it earlier than you do it alone. (ST21-Interview)
	Generating a variety of ideas	I agree that writing together in a small group, we can pool knowledge together and share more ideas that one person cannot have many ideas. (ST28-Reflection) Brainstorming session can provide good tips because good suggestions can produce a good paper at the end. (ST7-Reflection) When we work together, more wonderful points we can make or discuss and use them in our paper because more people mean more opinions or thoughts. (ST4-Interview) I think when there are more people to participate in group work, there will be more ideas to come up with and we can choose the good ones. (ST26-Interview)
	Improving the quality of writing	For me collaborative writing is much better than individual work because I can learn a lot of new phrases and vocabulary from my friends. He can show me how to correct my English. (ST28-Interview) For me group writing is fun and productive. I never did this in my country, but it's really astounding experience to learn how my friend from other country wrote. (ST2-Interview) I guess your essay can be revised and edited and that will give you opportunity to get a better score if all members support each other's writing. (ST17-Reflection)
	Enhancing communication skills	I think in group work, time is cut shorter to complete the project because it was done online, but of course we must communicate with each other in a constant basis and timely manner to meet deadline. (ST-19-interview) Collaborative work for me, it can help improve my communication because I can talk to my friends who don't speak my language. I think this is a great benefit to practice your communication skills. (ST4-reflection)

Table 3.9 Example of Data Coding and Meaning Categorization of the Interviews and Student Reflections (Continued)

Themes	Categorization	Examples
	Conflicts of ideas	A big challenge is related to argument and conflict of each with different ideas or thoughts. This really obstruct our work atmosphere and the member withdrew. (ST22-reflection)
		I think when there are more ideas there are disputes when the team fail to compromise. One person may think his idea is better than others. (ST26-interview)
		From what I experienced from collaborative writing in this class, we could come up with lots of things but not all ideas can benefit group work and we must be selective. (ST11-reflection)
Disadvantages of CW	Unequal participation of members	I remembered that when our group brainstormed before we started our first essay, some members raised ideas but they are not useful at all. (ST7-interview)
		I learn that when you work in group, there are members who just rely on their team. This behavior is nasty and not acceptable. (ST16-reflection)
	I prefer working alone because I can make a commitment. I came across some unpleasant experiences when I asked my group to contribute but they only did little on the last day. This gave me a bad experience of group work. (ST25-reflection)	
	I guess group work leaves more work to the members who can do better when the team has partners who lack responsibility. Someone must bear the part undone. (ST10-interview)	
	Time consumption	Different members have different views, so that when we make an agreement or decision, it takes a long time than what we expected. (ST8-reflection)
To me, working alone is much productive because when you work with others, you have to wait for them before you move on the next step. This can delay your plan. (ST13-interview)		
Incoherent writing	I discover that group work in fact takes longer when members are not cooperative. The work runs smoothly only when everyone supports each other. (ST4-interview)	
	When members don't start earlier and wait until the end before the deadline, they will rush to finish their parts, but when we combine the paragraphs, they look more like blocks and the essay lack good structure. (ST32-reflection)	
		If we divide up the section and don't revise it carefully before we send to the teacher, the essay will look strange and no logical transition from one paragraph to the other. This may downplay your writing quality. (ST15-interview)

The following table summarizes the research instruments and data analysis procedure used to address each research question.

Table 3.10 Summary of Research Instruments and Data Analysis

Research Question (RQ)	Instrument	Data Analysis
RQ1: Do collaborative writing tasks help to improve learners' writing performance in an argumentative essay? If so, how?	<ul style="list-style-type: none"> ■ Pre-test and post-test writing 	<ul style="list-style-type: none"> ■ Descriptive statistics ■ Paired samples t-test ■ Content analysis
RQ2: What patterns of interaction occur when learners engage in collaborative writing tasks via Google Docs	<ul style="list-style-type: none"> ■ Two CW tasks in GD: descriptive and argumentative essays 	<ul style="list-style-type: none"> ■ DocuViz ■ Percentage ■ Content analysis
RQ3: What are the writing change functions and language functions used in collaborative writing when learners are engaged in writing tasks?	<ul style="list-style-type: none"> ■ Two CW tasks in GD: descriptive and argumentative essays 	<ul style="list-style-type: none"> ■ Descriptive statistics ■ Conversation analysis from GD history archive
RQ4: What are the learners' perceptions of the web-based collaborative writing experiences in Google Docs?	<ul style="list-style-type: none"> ■ Post-task questionnaire ■ Semi-structured interview ■ Reflective journals 	<ul style="list-style-type: none"> ■ Descriptive statistics ■ Percentage, means ■ Content analysis

3.8 Trustworthiness and Validity

The researcher took rigorous measures to ensure that all research instruments used were evaluated, verified, and validated by experts in the field of English language teaching. The procedures of validating each research instrument are explained as follows.

Pre-test and Post-test Writing

The pre-test and post-test topic was assessed and validated by three experts (see list of experts in Appendix R) in terms of its usefulness, which included construct validity and practicality. That is, it reflected the goals of academic writing required in the English composition (construct validity) and it could measure learners' writing achievement (practicality) (Weigle, 2002). To evaluate the usefulness of the pre- and post-test, the three experts were provided with writing test instructions (see Appendix A) and a validation form

of the pre- and post-test writing (see Appendix B). The researcher revised the writing test instructions based on the given comments. The index of item-objective congruence (IOC) was 0.94 (see Appendix C). Three raters (researcher included) rated the learners' pre-and post-test writing to increase reliability.

CW Lesson Plans and CW Tasks in GD

To evaluate the lesson plans and CW tasks in GD for credibility, dependability, and practicality, the researcher submitted them to three experts in the field of English language teaching for review and comments for improvement. Three experts in the field of English language teaching (see Appendix R) validated the lessons and the IOC value was 0.95 for the lesson plans (see Appendix M).

Pre-task and Post-task Questionnaires

The researcher took measures to establish validity by submitting the questionnaires to three experts who specialized in English language teaching (see Appendix R) to review and validate the instruments. The researcher revised the questionnaires based on the experts' comments and resubmitted them to obtain an Item Objective Congruence (IOC) value for the tool. After reevaluation, the indexes of IOC values were 0.93 for the pre-task questionnaire (see Appendix H) and 0.95 for the post-task questionnaire (see Appendix I).

Semi-structured Interview Questions

The researcher constructed the semi-structured interview questions based on the research objectives, and requested three experts in the field of English language teaching (see Appendix R) to check their content validity and relevance. The IOC value obtained from the experts' validation was 0.91 (see Appendix Q).

Reflective Journal Guiding Questions

The researcher constructed six guiding questions to assist learners in reflecting on their CW tasks experience (see Appendix N). Three experts in the field of English language teaching (see Appendix R) checked the questions. The researcher made a few adjustments in wording based on the experts' comments, and requested them to revalidate the items. The IOC index obtained from the experts was 0.88 (see Appendix O).

To ensure the reliability of data coding and the coding scheme, the researcher invited an English language teacher in the FAH who has experiences in conducting qualitative studies to help with data coding. The researcher first discussed the coding schemes with the colleague and explained the guidelines, and practiced coding together for four hours. About 20% of qualitative data collected from the semi-structured interviews and student reflections were inter-coded by the researcher and his colleague. The inter-coder reliability reached 83%. Disagreements were resolved through negotiation and discussion. The researcher coded the remaining data and generated categories or themes.

3.9 Researcher's Role

It is worth mentioning that the author of this dissertation not only served as the researcher of this study, but also as the course instructor by overseeing the process of investigating the participants' writing interactions in CW process. This was to ensure that the participants understood their roles and their collaborative processes ran smoothly. The researcher organized an orientation session at the beginning of the study by training the participants and familiarizing them with working in small groups using GD. Furthermore, the researcher kept his main role as an outsider to allow data to emerge in a natural setting in different subcases (small groups). However, on some occasions, prompting was employed to raise awareness of task completion before a submission due date. Because the researcher concurrently served as the course instructor investigating the case study, he might play a part in shaping the research process to reach its objectives and allowing inquiries to be carefully reflected upon in the findings and conclusions.

Due to the nature of the study itself, providing adequate rapport and clear guidance to the participants was crucial; otherwise, the research objectives and inquiries would not be achieved. The investigation of CW in small groups with learners from diverse cultural backgrounds is scantily studied in the field, and writers might not want to collaborate with one another without any intervention. Therefore, researcher intervention could encourage learners with different cultural backgrounds to interact in small groups more spontaneously. Nonetheless, it could be argued that while the researcher was wearing

two hats, he still maintained a passive role during the CW activities. This could minimize the influence on learners' collaboration and interaction. To further minimize the subjectivity, the researcher ensured to all the participants that their active or passive participation in their group work, interaction with peers, and composing reflective journals, were all rendered on a volunteer basis and had no impact on their scores or final grades. They might choose to continue or discontinue participating in the group tasks if they encountered negative peer pressure or personal conflicts. Their decision on discontinuation of group participation would not bring them any penalty.

To provide a comprehensive understanding of the nature of the study, the researcher discussed issues related to the study from the pilot study in the following section.

3.10 Pilot Study

A pilot study, also known as a feasibility study, is a small-scale preliminary study designed to gather initial data or information prior to launching the main study (Smith, 2015). A pilot study is essential to refine the design of specific research methods chosen by the researcher and to evaluate or check their acceptability, feasibility, validity, or reliability of the constructed instruments that the researcher plans to manipulate in the main study. A pilot study is helpful since it can notify deficiencies in the research design or the constructed instruments of the proposed study in that the researcher can rectify the flaw or weakness prior to conducting the main study.

In the present study, the researcher conducted a pilot study by testing the research instruments used in the main study consisting of the pre-test and post-test, two CW tasks, the pre-task and post-task questionnaires, semi-structured interview questions, and reflective journal guiding questions. The researcher conducted the pilot study in the same vein as the preparation of all the necessities during the first semester of the 2019-2020 Academic Year. Appendix T explains how the pilot study was administered, including the participants, data collection, data analysis, and results of the pilot study. From the pilot study, the researcher observed some limitations which could be improved in the main study. The limitations are discussed in the following.

Limitations and Implications for the Main Study

The researcher carried out the pilot study in a full-scale version as planned in the main study spanning over thirteen weeks (August-November 2019). During the pilot study, the researcher could try out all the research instruments intended for the main study with 17 undergraduates, representing eight countries in Asia, who were enrolled in ENGL 3257 Applied Grammar and Academic Writing course, a relatively similar writing course to English composition. However, after the research instruments had been tried out, the researcher found some limitations and improvement areas to be implemented for the main study. The researcher discussed those problems encountered during the preliminary study and improvement plans for the main study in Table 3.11.

Table 3.11 Problems Encountered and Improvement Plans for the Main Study

No	Instruments /Activities	Problems Encountered	Improvement Plans
1	Group Formation	In the pilot study, 41% of the participants were Thai students. Therefore, forming a small group of three to four members with different cultural backgrounds was challenging. This occurrence restricted opportunities to explore a variation in multilingual peer interactions while performing a CW task. Because of the limited number of group variations in the pilot study, the researcher selected only two small groups to carry out an embedded case study.	In the main study when more EFL first year university students enrolled in ENGL111 English composition course, the researcher could select diverse cases to analyze their CW patterns and interactions and draw substantial conclusions.
2	Orientation to CW in Google Docs	None of the participants had experience working on a WBCW task (e.g., GD) prior to joining the pilot study. Training learners to become familiar with the CW was a painstaking process and learners needed time to familiarize themselves to use GD independently.	In the main study, the researcher scheduled extra hours and called group representatives for additional training so that they could teach and demonstrate to their teammates.

**Table 3.11 Problems Encountered and Improvement Plans for the Main Study
(Continued)**

No	Instruments /Activities	Problems Encountered	Improvement Plans
3	Inactive Interactions	The members in each small group showed low mutual engagement with each other while performing collaborative tasks due to the lack of experience in CW experience. Additionally, learners of each small group came from different cultural backgrounds, learning styles, and learning preferences.	The researcher took a role of observer as participant in the main study and provided a stimulus to learners by giving comments or feedback, if necessary, while observing their collaboration This could help learners in small groups to produce language functions more spontaneously.
4	Semi-Structured Interview	From the observation, solely following the semi-structured interview guiding questions, the researcher could not obtain a broad range of data or reached a point of data saturation. The participants felt nervous to respond to questions.	In the main study, the researcher employed some unstructured questions or unplanned prompts while interviewing the participants to obtain richer data. The researcher built rapport with interlocutors and created a relaxed atmosphere during the interview.
5	DocuViz (Data Visualization Tool)	There were few deficiencies of DocuViz, for example, when a member made a revision and copied a former text produced by his peer and placed the text in a new paragraph, the colored bar or "slice" would be treated as the editor's not the original writer's. The amount of text in the final version gave a credit to the editor not to the original writer. Additionally, DocuViz did not detect comments or chats.	Members in small groups were informed that they should let their CW process flow naturally and they must not copy and paste their peer's contributed texts and claim to be theirs. Chats or comments entered in the cloud drive were analyzed through comment history in GD not through DocuViz.

3.11 Ethical Considerations

The researcher strictly followed research ethical procedures as regulated by the Institutional Review Board (IRB) of the School of Foreign Languages, Suranaree University of Technology. The researcher carefully studied the code of research ethics defined in the institutional research handbook to ensure that appropriate steps of carrying out the study were well cared for to protect the rights of each participant.

After the proposal defense committee approved the research proposal, the researcher submitted the protocol and the required documents to the Office of Human Research Ethics Committee of Suranaree University of Technology to approve the research project. Once the Human Research Ethics Committee officially approved the research project (Project Code: EC-63-61), the researcher submitted an official letter to the Vice President of Academic Administration and the Dean of the FAH of AIU requesting permission to carry out the study for 14 weeks, or one academic semester, as planned in the research timeline. Having received the permission from the university, the researcher started an orientation and discussed the research plan with the target participants in the first and second week of the semester. The researcher explained to the participants about the objectives of the study. Their rights and any private information would be kept confidential, and only pseudonyms would be used in reporting the data results. Following this, the informed consent form was distributed for the participants to sign.

To conclude, this chapter presented the research methodology used in the research study which includes research design, setting of the study, participants, variables, instruments, data collection procedure, data analysis, trustworthiness and validity, the researcher's roles, and pilot study. It ended with ethical considerations. The next chapter presents results of the study.

CHAPTER 4

RESEARCH FINDINGS

In this research study, answers were sought to the following four research questions outlined in Chapter 1: 1) Do collaborative writing tasks help to improve learners' writing performance in an argumentative essay? If so, how?; 2) What patterns of interaction occur when learners engage in CW tasks via GD?; 3) What are the writing change functions and language functions used in CW when learners are engaged in writing tasks?; 4) What are the learners' perceptions of the web-based collaborative writing experience in GD?. Research Question 1 was analyzed using descriptive statistics, a paired samples *t*-test, and content analysis. Research Question 2 was analyzed using DocuViz, descriptive, and content analysis. Research Question 3 was analyzed using descriptive statistics and content analysis, and Research Question 4 was analyzed through descriptive statistics (percentages and mean scores) and qualitative content analysis.

4.1 Answer to Research Question 1

Do collaborative writing tasks help to improve learners' writing performance in an argumentative essay? If so, how?

A clear-cut answer to this question is 'yes'. To measure the learners' writing performances, the researcher employed the dependent *t* test to determine if learners improved their writing after engaging in CW tasks. The difference between the learners' pre- and post-test scores are displayed in Table 4.1.

Table 4.1 Results of Overall Writing Performance in Pre-test and Post-test

Writing Performance	N	M	SD	MD	<i>t</i>	df	<i>p</i>
Pre-test	35	66.69	8.93				
Post-test	35	74.28	10.09	7.58	-7.28	34	000.

Note. * $p < .001$ (2-tailed)

The results (Table 4.1) demonstrate that learners' writing performance showed a significantly increase in their post-test writing ($t(34) = -7.28, p < 0.001$) after participating in the CW activities. The mean difference (MD) was 7.58 implying that learners obtained significantly higher average mean scores in the post-test writing. From the standard deviation (SD), it can be implied that the post-test scores seemed to be slightly more heterogeneous than their pre-test scores although the difference is minimal. From the findings, it can be concluded that CW tasks implemented in the study helped to improve learners' writing performance in an argumentative essay at a certain level (MD = 7.58). In the following subsections, the manner in which the CW tasks enabled improvements in learners' writing performance are discussed.

4.1.1 Domain-Specific of Learners' Writing Performance

Three raters (see list of experts in Appendix R) assessed each domain of the pre- and post-test writings using an analytic scoring rubric on scores allocated to content (30 points), organization (20 points), vocabulary (20 points), language (25 points), and mechanics (5 points). The language domain mean scores of the pre- and post-test writings were compared to mark learners' writing improvement. The paired-samples *t*-test results of each language domain are presented in Table 4.2.

Table 4.2 Results of Learners' Writing Performances by Domain

Domain	Writing Test	N	M	SD	MD	t	df	p
Content	Pre-test	35	19.84	3.08	2.37	-6.41	34	.000
	Post-test	35	22.21	2.83				
Organization	Pre-test	35	13.91	1.67	1.29	-5.05	34	.000
	Post-test	35	15.21	1.85				
Vocabulary	Pre-test	35	14.00	1.74	1.19	-5.56	34	.000
	Post-test	35	15.20	1.98				
Language	Pre-test	35	15.80	2.70	2.15	-5.71	34	.000
	Post-test	35	17.96	3.15				
Mechanics	Pre-test	35	3.12	0.32	0.58	-5.95	34	.000
	Post-test	35	3.71	0.72				

Note. * $p < .001$ (2-tailed)

The results from analysis by domain are shown in Table 4.2. These demonstrate that there was a significant difference ($p < .001$) in each domain between the pre- and post-test writings. The learners' writing performance improved substantially as observed in the increase of mean scores for each domain. The average scores of the post-test for "content" increased 2.37 points, whereas "organization" and "vocabulary" increased 1.29 points and 1.19 points respectively. The domain "language" improved 2.15 points in the post-test mean score, and "mechanics" gained 0.58 score on a five-point scale. The standard deviation (SD) indicated that the average score of the post-test for "content" was more homogenous than the pre-test average scores, whereas the post-test scores for other language domains showed a slightly higher level of heterogeneity compared to the pre-test average scores. Aside from learners' improvement on language domain specific indicated in the scoring rubric, other language features were improved. These included textual features such as longer content of the essay, the use of hedging and boosting devices, conjunctions, and reporting verbs. These language features are discussed in the following subsection.

4.1.2 General Textual Features

In this section, general information is discussed regarding (a) the written texts from learners pre- and post-tests, (b) the syntactic complexity, (c) accuracy, (d) the use of hedging and boosting devices, (e) the use of conjunctions, (f) the use of reporting verbs, and (g) improved evidence of counterarguments and rebuttals. These are the elements believed to contribute to the quality of argumentative essays that the participants produced in their post-test writing after engaging in CW activities. They are discussed below.

a. Written Texts from Pre-test and Post-test

The learners were given 70 minutes to construct a 400 to 500-word argumentative essay entitled “*All levels of education, from primary school to university, should be free of charge.*” The exercise was completed in the language laboratory using desktop computers, without internet or any other learning resources being available. The results are summarized in Table 4.3. In the table summaries are provided of the descriptive data of that includes word count totals, number of paragraphs, average word counts, and paragraphs per student in their pre- and post-test writing.

Table 4.3 Descriptive Data of Learners’ Pre- and Post-test Writing (N=35)

Students' Writing Performance	Genre	Total		Average	
		Word Counts	Paragraphs	Word Counts	Paragraphs
Pre-test Writing	Argumentative	11,029	126	315.11	3.60
Post-test Writing	Essay	20,248	181	578.51	5.17

As shown in Table 4.3 for the post-test, learners had developed more extended written texts accounted for a total of 20,248 words and 181 paragraphs, compared to 11,029 words and 126 paragraphs in the pre-test (nearly a two-fold increase of word counts). The increase in texts could provide extended information with supporting details, which can improve the content of the essay.

b. Syntactic Complexity

Syntactic complexity is perceived to be a distinctive feature of academic writing. In a large-scale research synthesis, there are five types of syntactic complexity (see Lu, 2010, 2011). These types involve measuring the length of the production unit, sentence complexity, subordination, coordination, and particular structures. However, in this study only two types of syntactic complexity were shown, namely, length of production unit and sentence complexity. This was to illustrate changes in learners writing performance on the post-test essay. The length of a production unit is made up of three ratios, namely mean length of clause (MLC) involving number of words per clause; mean length of sentence (MLS) involving the number of words per sentence; and mean length of T-unit (MLT) involving the number of words per T-unit. Finally, sentence complexity was measured by the number of clauses occurring per sentence (Kyle & Crossley, 2018). The current researcher employed Lu's (2017) L2 syntactic complexity analyzer (L2SCA) to perform the analysis. The results of learners' writing performance concerning the length of the production unit and sentence complexity are shown in Table 4.4.

Table 4.4 An Overview of Analysis on Length of Production Unit and Sentence Complexity

Variable	Writing Performance	N	M	SD	MD	t	df	p
Mean length of sentence (MLS)	Pre-test writing	35	19.41	5.07	1.41	-1.98	34	.055
	Post-test writing	35	20.81	6.63				
Mean length of T-unit (MLT)	Pre-test writing	35	16.75	3.36	0.51	-2.34	34	.025
	Post-test writing	35	17.26	3.05				
Mean length of clause (MLC)	Pre-test writing	35	9.32	1.61	0.84	-3.58	34	.001
	Post-test writing	35	10.15	1.73				
Clause per sentence (C/S)	Pre-test writing	35	2.12	0.58	0.31	-2.46	34	.019
	Post-test writing	35	2.43	0.83				

* $p < .05$ (2-tailed)

Note: *t*-unit: An independent clause and any clauses dependent on it

As shown in Table 4.4, learners were found to produce more clauses embedded in an independent clause in their post-test writing compared to their pre-test writing as evident by a significant difference in MLT ($MD = 0.51, p = .025$). Likewise, it was found that learners produced more words in a clause post-test, as evident by a significant difference in MLC in the post-test writing compared to their pre-test writing ($MD = 0.84, p = .001$). The findings also revealed that learners constructed more clauses per sentence (C/S) in their post-test writing, which made their essays contain more complex sentences compared to their pre-test writing ($MD = 0.31, p = .019$). From these findings, it can be inferred that CW tasks yield positive effects on individual writing performance. Three examples of sentence complexity produced by the participants in the post-test writing are demonstrated as follows:

- ◆ Some graduates have fallen hard into debts, which carry on well into their later life, making it very difficult to survive amidst the global economic crisis (ST19-Post-test)
(A compound complex sentence that contains two dependent clauses marked by a comma)
- ◆ One of the other reasons is that most universities in the world are operated autonomously under their local government standard using their own monetary funds, and they received no supports from the central government (ST10-Post-test)
(A compound complex sentence that contains a relative clause and another independent clause marked by a conjunction)
- ◆ It is unfortunate that in many public colleges have a terrible reputation regarding their overall quality, which is why most people opt to enroll in a private institution instead (ST18-Post-test)
(A compound complex sentence that contains two dependent clauses with a prepositional phrase)

c. Accuracy

Writing accuracy measurements covered various types of errors including structure, unclear sentences, fragments, run-on, punctuation, capitalization usage, redundancies, wrong form, subject-verb agreement, verb tense, plural forms, articles, pronouns, or spelling (Bailey & Judd, 2018). Accuracy rate was measured by the ratio of error-free clause in the pre- and post-test writing, and the average free-error clauses per

T-unit (Chuang, 2018). The analysis of accuracy measures on learners' pre- and post-test writing is shown in Table 4.5.

Table 4.5. Analysis of Accuracy Measures on Learners' Pre-and Post-test Writing

Indicator	Writing Performance	N	M	SD	MD	t	df	p
Total Clauses (T-Unit)	Pre-test	35	16.88	4.98	15.02	-	34	0.000
	Post-test	35	31.91	7.78		11.89		
Error-Free Clauses	Pre-test	35	5.08	4.81	7.82	-6.25	34	0.000
	Post-test	35	12.91	8.99				
Error-Free Clauses to Total Clauses (%)	Pre-test	35	29.08	25.88	10.19	-2.4	34	0.022
	Post-test	35	39.28	25.73				

Note. * $p < .05$ (2-tailed)

The analysis revealed that learners had a significant increase in error-free clauses from pre-test writing ($M = 5.08$; $SD = 4.81$) to post-test writing ($M = 12.91$; $SD = 8.99$). The average of error-free clauses to total clauses for pre-test writing was 29.08%, whereas the average of error-free clauses to total clauses for post-test writing increased to 39.28%. The findings imply that CW had a positive effect on increased accuracy of learners' texts, as their post-test writing mean score increased by 10.19%.

d. Hedging and Boosting Devices

The use of interactional metadiscourse that includes hedging and boosting devices in composing an argumentative essay in English can help novice writers to express ideas confidently, integrate themselves into the writing content, and cultivate their critical thinking to enhance writing skills. The current researcher used AntConc version 3.2, developed by Anthony (2004), to perform the analysis to identify hedging and boosting devices used in learners' pre-and post-test writing. The deployment of hedging and boosting devices in learners' pre- and post-test argumentative essays is presented in Table 4.6.

Table 4.6 Total Frequency of Hedging and Boosting Devices

Writing Performance	Modality					
	Hedges		Total	Boosters		Total
Pre-test	argue (2)	might (6)	77	actually (1)	obviously (1)	14
	believe (6)	possible (3)		clearly (1)	of course (2)	
	claim (1)	seem (1)		found (2)	significantly (1)	
	could (12)	tend to (2)		greatly (3)	surely (1)	
	likely (1)	think (32)		in fact (2)		
	may (11)					
Post-test	argue (9)	might (24)	133	actually (5)	obviously (1)	35
	believe (12)	possible (4)		clearly (3)	of course (2)	
	claim (2)	seem (4)		found (4)	significantly (3)	
	could (31)	tend to (2)		greatly (5)	surely (6)	
	likely (1)	think (19)		indeed (3)	truly (1)	
	may (25)			in fact (2)		

As seen in Table 4.6, the participants employed a broader range of hedging and boosting devices in their post-test compared to their pre-test writing. Particularly verbs of cognition (e.g., argue, believe, think), and modal verbs (e.g., could, may, might) were used widely in both pre- and post-test writings. However, the verb “think” was used less in the post-test, for such hedging expression defines the learners’ uncertainty in making rationale claims in arguments. These learners improved their stronger claims by employing a broader range of boosting devices. Some examples of hedgings deployed by the learners showing their uncertainty (weak opinions) in the pre-test writing are illustrated as follows:

- ◆ I **think** the levels from primary to high school should be free of charge. (ST11-Pre-test)
- ◆ I **think** the education should not be free because education is important. (ST33-Pre-test)
- ◆ I do not **think** people should get free charge of university. (ST14-Pre-test)
- ◆ I **believe** all education from primary education to university should be free because it provides people with opportunity. (ST15-Pre-test)
- ◆ When people have education, they **may be** helpful in the future (ST31-Pre-test)

In the post-test writing, however, it is apparent that learners deployed boosting devices that could strengthen their claims and confidence. Some examples of boosting devices are demonstrated as follows:

- ◆ If tuition fees for public learning institutions were to be abolished, it would **significantly** help the lives of many less fortunate people. (ST17-Post-test)
- ◆ It has been shown **clearly** that education gives the students value of their life application and prosperous future. (ST30-Post-test)
- ◆ When graduates get a job, they **surely** can earn a higher salary than the uneducated ones since they have both skills and knowledge. (ST11-Post-test)
- ◆ At the other angle, we may perceive that student **actually** benefit a lot from higher education in university, in terms of not only academic knowledge, but also this knowledge enables them to become financially independent. (ST25-Post-test)
- ◆ If education is provided freely to all young learners, burdens of accumulated debts on families and financial constraints would be decreased **significantly**. (ST18-Post-test)

e. Conjunctions

The use of transitional signals and conjunctions in academic writing is essential as they help connect the flow of idea in one sentence with another or even between paragraphs to show a unified text. These cohesive devices are essential elements in writing academic essays for they are perceived as making a good composition. Table 4.7 shows the total frequency of conjunctions employed by the learners to establish coherence, the flow of ideas and relation of information when they performed the pre-test and post-test writing.

Table 4.7 Total Frequency of Conjunctions Deployed in Pre and Post-test Writing

Types of Conjunction	Writing Performance					
	Pre-test		Total	Post-test		Total
Addition	additionally (0)	firstly (4)	35	additionally (2)	firstly (5)	64
	besides (2)	secondly (6)		besides (4)	secondly (8)	
	in addition (2)	third(ly) (3)		in addition (8)	third(ly) (6)	
	furthermore (2)	last(ly) (7)		furthermore (2)	last(ly) (9)	
	moreover (7)	finally (2)		moreover (13)	finally (7)	
Concession	although (4)	whereas (0)	12	although (13)	whereas (2)	43
	even though (2)	while (3)		even though (5)	while (16)	
	though (3)			though (7)		
Causality	because of (13)	therefore (10)	35	because of (26)	therefore (15)	66
	consequently (1)	since (6)		consequently (1)	since (9)	
	due to (5)			due to (15)		
Elaboration	especially (9)	for instance (2)	32	especially (10)	for instance (3)	55
	for example (10)	such as (11)		for example (19)	such as (23)	

As seen in Table 4.7, the frequency counts analyzed through AntConc (a corpus analysis toolkit) illustrate that learners employed more conjunctions in the post-test than in the pre-test writing. A reason for using more conjunctions in the post-test writing might be that their written texts contained a longer stretch of discourse; therefore, a greater use of conjunctions could help them produce a more logical connectivity between sentences and paragraphs. Causal conjunctions, such as *because of*, *due to*, and *therefore*, were used widely to help learners express casual relations between the discourse units. The following examples, extracted from the learners' post-test writing, indicate how the causal conjunctions *because of* and *due to* were employed.

- ◆ One may argue that in most third-world countries, families with income that is almost next to nothing cannot afford to send their children to school *because of* the underlying fees like allowance, food, transportation, uniform, and books though there is free access to education. (ST18-Post-test)

- ◆ In a school, there will be many kinds of expenses as well as an ongoing maintenance cost **due to** the increased demand from the student parents or patrons. (ST31-Post-test)

Aside from the varied use of causal conjunctions, learners also employed various additive conjunctions, as they supplied additional detail to the preceding sentence to support the argument. The following examples, extracted from the learner's post-test writing, show how the additive conjunctions *moreover* and *furthermore* were used to connect two pieces of information.

- ◆ Although some people argue that free education have some advantages in its respects, however, it will cause the outcome of unemployment, increase the burden of the general population, and reduce the quality of education. **Moreover**, the social welfare agencies have offered assistance, the government provides the educational loan, and most colleges provide the scholarships and part-time works for those who have financial difficulties. (ST10 - Post-test)
- ◆ Therefore, all the young people had a chance to obtain high quality of education when education is made available to all; **furthermore**, with the support from the government and agency, many people would have a chance to be promoted at workplaces or go for upgrading. (ST22 - Post-test)

f. Reporting Verbs

In composing an argumentative essay, learners need to deploy a variety of reporting verbs when citing the works of others. The classification of reporting verbs given by Hyland (2002) was chosen to examine the learners' choices of reporting verbs. These reporting verbs are classified into three categories: discourse verbs (related to verbal expressions, such as said, suggest, told, announce), cognition verbs (concerned with mental processes, such as argue, claim, posit), and research verbs (dealing with actions and activities, such as show, reveal, discover). The frequency counts of reporting verbs in learners' pre- and post-test writing are shown in Table 4.8.

Table 4.8 Types of Reporting Verbs

Writing Test	Reporting Verbs	Frequency
Pre-test Writing	<i>Cognition verbs:</i> argue (2) claim (1) <i>Discourse verbs:</i> said (2), suggest (1) told (2) <i>Research verbs:</i> show (2)	10
Post-test Writing	<i>Cognition verbs:</i> argue (9) claim (2) <i>Discourse verbs:</i> announce (1) indicate (1), state (3), <i>Research verbs:</i> discover (2), estimate (2) report (2), show (2), shown (3)	27

An analysis revealed that learners' choices of deploying reporting verbs in their post-test writing were varied slightly. Learners used cognition verbs, such as *argue*, more often to refer to the work of others. Likewise, reporting verbs on research verbs were used varyingly to make writing appealing. The following examples, extracted from the learner's post-test writing, indicate how the choices of these reporting verbs appeared in their essays:

- ◆ In the recent years, the government **announced** that every child should have access to a proper education system. (ST5-Post-test)
- ◆ Some people may **argue** that giving free education at all levels is profitable for students do not need to worry about tuition fees and parents' financial burdens. (ST12-Post-test)
- ◆ Research **has shown** that offering a free class to learn a lesson, most of students will rather skip class for not perceiving its core value. (ST24-Post-test)

g. Evidence of Counterarguments and Rebuttals

One of the highlights that makes an argumentative essay strong and impressive is the use of a counterargument (expressing the viewpoint of a person who holds a contradicting idea) and the rebuttal technique (pointing out flaws of an opponent's stance in the counterargument and presenting your claims as being more valid). This implies that the author acknowledges other viewpoints, and it gives an impression that the author is justifiable and willing to look at matters from varied viewpoints. The data given in Table 4.9 illustrate the total counterarguments and rebuttals deployed by the learners in their pre- and post-test writing.

Table 4.9 Evidence of Counterarguments and Rebuttals

Writing Performance	N	Evidence of using counterarguments and rebuttals
		(no. of hits)
Pre-test	35	13
Post-test	35	32

As shown in Table 4.9, the learners showed increased evidence of using counterarguments and rebuttals in their post-test writing (32 times) compared to their pre-test writing (13 times). The following examples, extracted from the learner's post-test writing, indicate how counterarguments and rebuttals are stated.

- ◆ Some people argue that everyone should have an equal access to schools. It indeed seems unfair that fewer people are going to lose job opportunities due to their financial constraints. But if the students do not pay for their education, someone needs to cover up the cost for them. Two possible ways to get the money: increasing the taxes, but not all the taxpayers will go to school, and cutting the government investment on infrastructure. (STD 11-Post-test)
- ◆ One may argue that in most third-world countries, families whose income that is almost next to nothing cannot afford to send their children to school because of the underlying fees like allowance, food, transportation, uniform, and books though there is free access to education. However, this is where non-governmental organizations come in. It is part of their job to the people to help through

foundations. There are countless scholarship opportunities that are as accessible to many as how education should also. (STD 3-Post-test)

- ◆ Some people claim that if everyone can get a free education, people will have good jobs to boost the economy of the country. It might be true that providing a free education gives equal opportunity to all citizens. However, when we look at it in a different realm, allowing everyone to access to free education means a colossal expenditure to be invested, and not everyone perceives core values when things are granted freely. Sadly, the gigantic expenses may end in vain instead of incubating assets or thriving the country economy. (STD 18-Post-test)

In short, learners use of language features varied, including extended content of writing, complex sentences, and language accuracy. The features included hedging and boosting devices, conjunctions, reporting verbs, and evidence of counterargument and rebuttal technique. The use of such devices could contribute to the development of writing styles and make a positive impact on the qualitative of argumentative writing, which in turn resulted in better scores. Research Question 2 is discussed in the next subsection.

4.2 Answer to Research Question 2

What patterns of interaction occur when learners engage in collaborative writing tasks via Google Docs?

The present researcher employed DocuViz to generate data from GD files to interpret the patterns of interaction and CW styles. The findings obtained from GD history archives were analyzed quantitatively in terms of percentage of text contributions. The overall patterns of small group interactions and their CW styles are discussed succinctly in the following sections.

4.2.1 Overall Patterns of Small Group Interactions and CW Styles

In the CW tasks performed in GD, patterns of interaction were ascribed to the actions of learners in small groups involving negotiated writing tasks and jointly constructed texts using the cloud-based tool to complete the group essays. Learners'

interactions and task negotiation were observed through GD archives. The overall pictures of CW styles from different groups detected are displayed in the following figures.

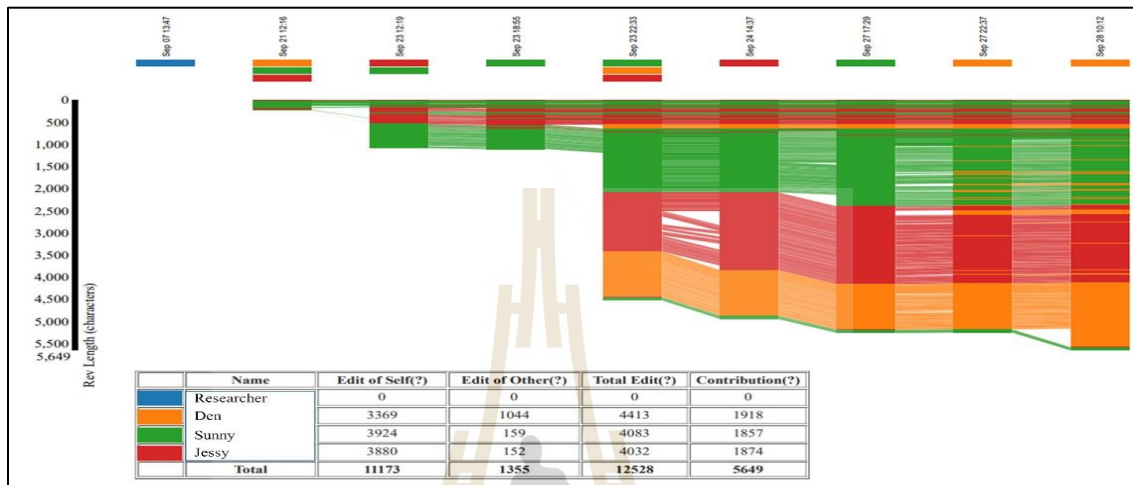


Figure 4.1 A Bar Chart Illustrating a Collaborative Style (CW Task 1 | Group 1)

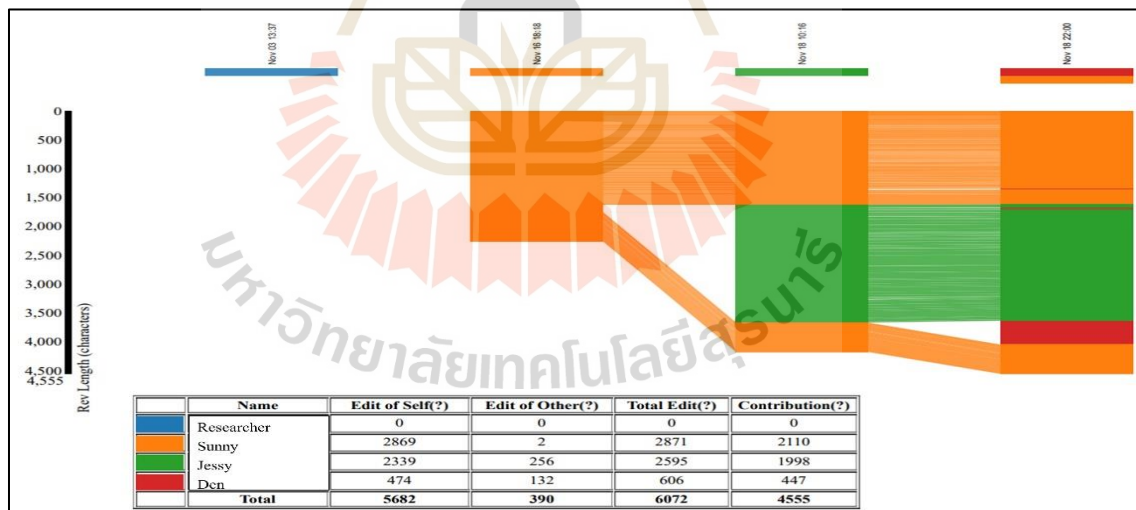


Figure 4.2 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 1)

Group 1 consisted of three male students from India (Sunny), Malaysia (Den), and the Philippines (Jessy). In Task 1 (Figure 4.1), the team produced a collaborative style while completing the group task spanning one week. The members planned the outline

together and later divided the task. However, they were engaged with each other's texts when Den made some changes on Sunny and Jessy's contributions. The analysis from DocuViz showed that the proportion of members' contributions were relatively equal: Sunny and Jessy each contributed 33%, and Den shared 34%. In Task 2 (Figure 4.2), the writing behaviour changed to the main writer style when two members did most of the work. The team failed to show interaction. Although they were given three weeks to complete the task, they spent only two days to complete the task. The group procrastinated in starting their work. The analysis revealed that Sunny initiated a topic near the submission deadline and wrote the introduction and the first body paragraph. Jessy added the second and third body paragraphs, whereas Den produced a brief conclusion. Sunny and Jessy each shared 46% and 44% respectively, while Den contributed 10% to the final version.

Figures 4.3 and 4.4 illustrate Group 2 CW Styles while performing group work.

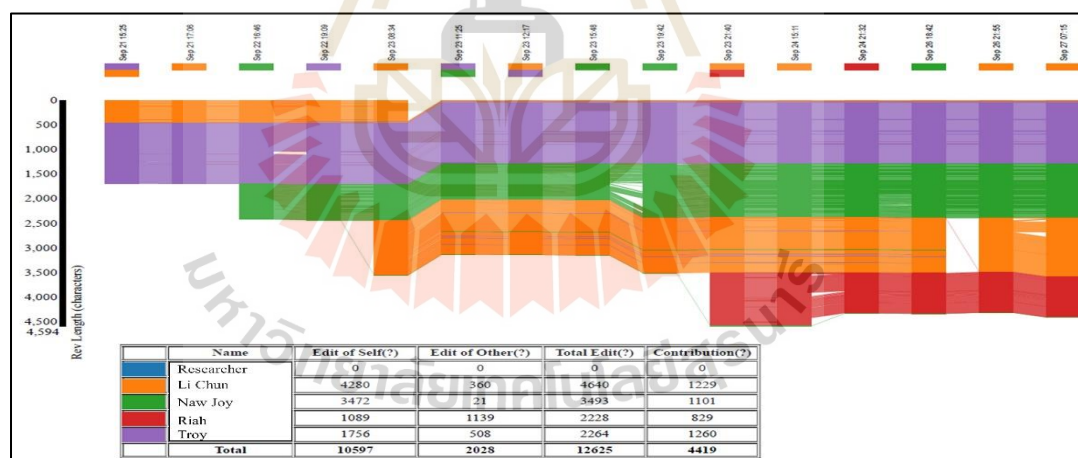


Figure 4.3 A Bar Chart Illustrating a Divide and Conquer Style (CW Task 1|Group 2)

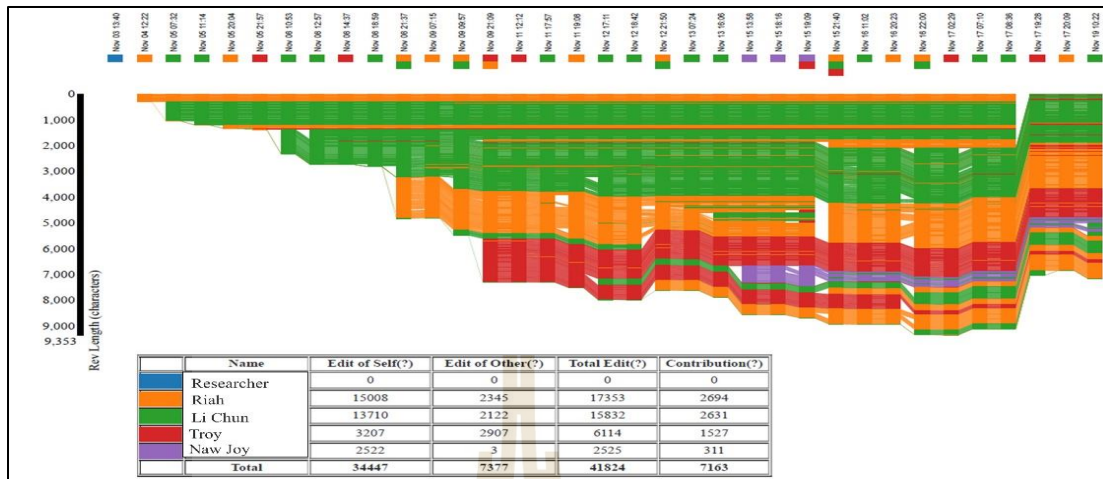


Figure 4.4 A Bar Chart Illustrating a Collaborative Style (CW Task 2 | Group 2)

Group 2 had four members (one male and three females) from China (Li Chun), Indonesia (Riah and Troy), and Myanmar (Naw Joy). In Task 1, the team spent one week to complete the task although they were given three weeks. The members divided the workloads and rarely interacted with each other's text. The final version was contributed proportionally as follows: Riah shared 19%, Li Chun made 28%, Troy 29%, and Naw Joy 25%. The group CW style appeared to represent sequential writing as characterized by Lowry et al. (2004). In Task 2, the team interaction shifted to a collaborative style where they were engaged with each other's texts. The group spent 16 days to work on Task 2. Riah and Li Chun contributed the most to the final version (38% and 37%), whereas Troy shared 21%, and Naw Joy 10%.

Figures 4.5 and 4.6 display the interaction patterns and CW styles of Group 3 members across two CW tasks.



Figure 4.5 A Bar Chart Illustrating a Cooperative Style (CW Task 1 | Group 3)

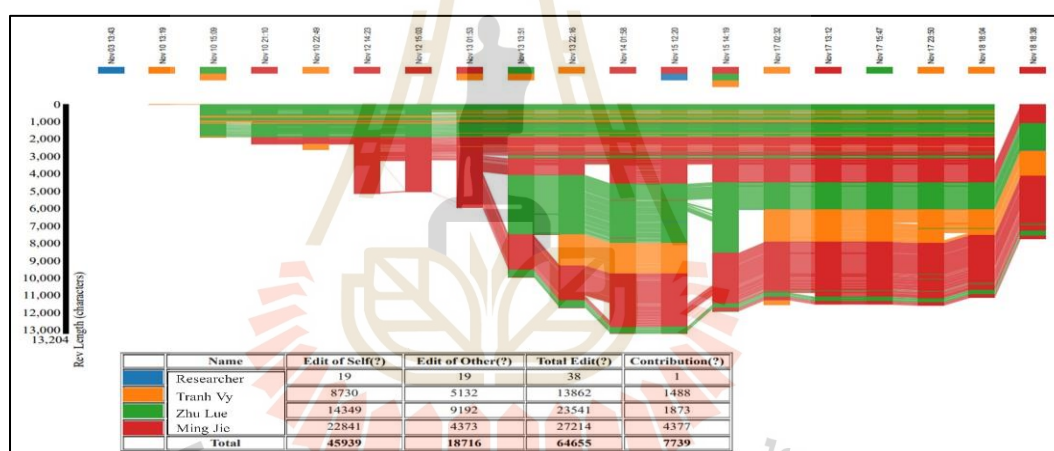


Figure 4.6 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 3)

Group 3 involved two females from China (Zhu Lue and Ming Jie) and a third from Vietnam (Tranh Vy). In Task 1, the team spent one week to complete the task. The analysis from GD history revision showed the group divided the workload proportionally: Ming Jie started the introduction and wrote the first body paragraph, Zhu Lue added the second and third body paragraphs, and Tranh Vy worked on the conclusion. The members were rarely engaged with their peers' texts but offered comments. The work was done cooperatively, in which Ming Jie shared 41%, Zhu Lue 30%, and Tranh Vy 28%. In Task 2, the group CW style shifted to a main writer style. The team dedicated eight days to

complete the work although they were given three weeks. Zhu Lue initiated a topic, but during the writing process, she removed texts she added earlier. Ming Jie and Zhu Lue occasionally interacted with each other’s texts. However, Ming Jie made the most contributions (57%), followed by Zhu Lue (24%), and Trinh Vy (19%) to their final draft.

Figures 4.7 and 4.8 show the CW styles and interaction patterns adopted by members of Group 4 across two tasks.

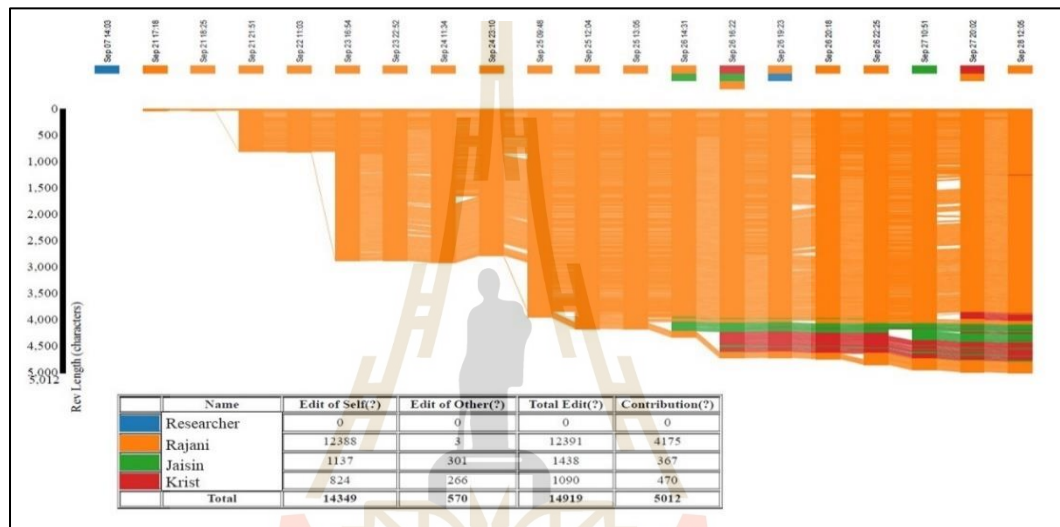


Figure 4.7 A Bar Chart Illustrating a Main Writer Style with One Member Absence (CW Task 1 | Group 4)

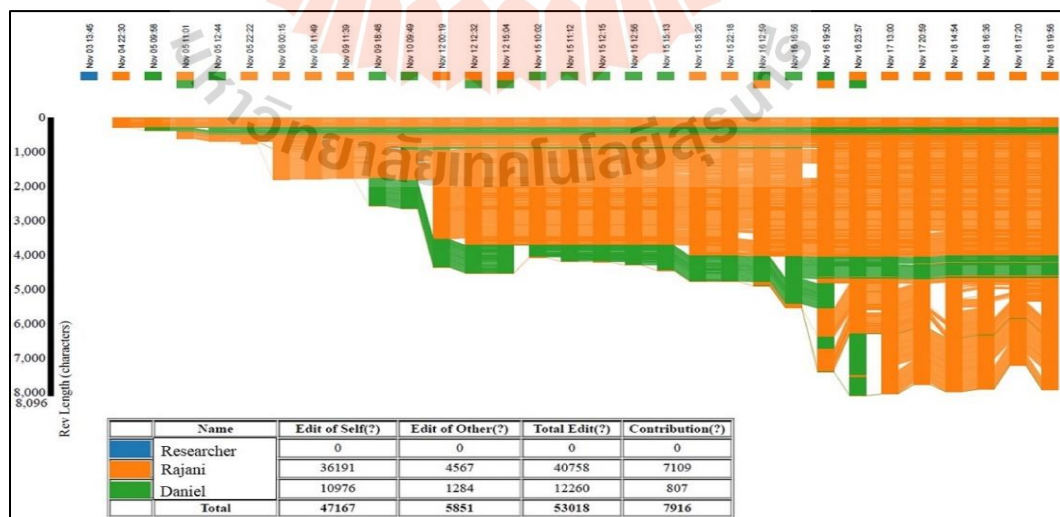


Figure 4.8 A Bar Chart Illustrating a Non-Collaborative Style – Two Members Absence (CW Task 2 | Group 4)

Group 4 consisted of one female from India (Rajani) and three male students from Malaysia (Daniel) and Thailand (Jaisin and Krist). In Task 1, the group exhibited a main writer style. Surprisingly, one member failed to participate in the writing, leaving one member did most of the work (83%). The other two contributed minimally: Jaisin added 7% and Krist 10%. Their contributions came three days prior to the submission deadline. From the GD archives, the members rarely interacted with their peers' texts. Likewise, in Task 2, the group failed to interact with each other. Two were absent in Task 2. The same person who contributed the most in Task 1 took control of Task 2, with minimal help being received from her partner from Malaysia. The task spanned two weeks and was completed by two members (Rajani contributed 90% and Daniel 10%).

Figures 4.9 and 4.10 display the CW styles adopted by Group 5 and interactions across two CW essays.

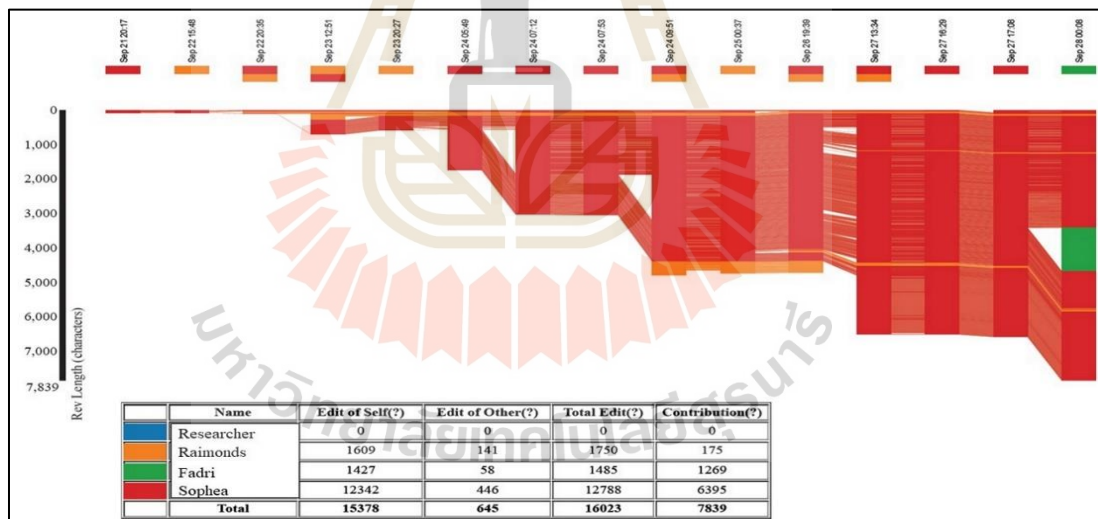


Figure 4.9 A Bar Chart Illustrating a Main Writer Style (CW Task 1 | Group 5)

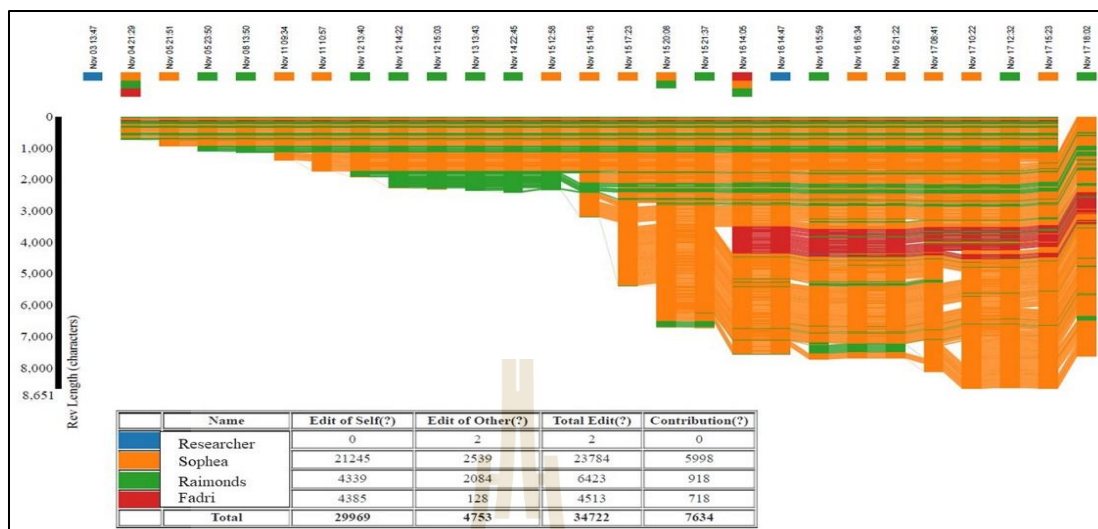


Figure 4.10 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 5)

Group 5 had three members, one female from Cambodia (Sophea) and two males from Indonesia (Raimonds and Fadri). In Task 1, the team exhibited a main writer style, in which Sophea mostly constructed texts (82%) with minimal help from Fadri (16%) and Raimonds (2%). The group spent one week to complete Task 1. Surprisingly, Fadri only contributed on the last day when the assignment was due, while Raimonds showed many login attempts but rarely contributed. The members failed to engage with their peers' texts. In Task 2, the CW style remained stable. The same person who contributed the most text in the first task took control of Task 2. The members rarely were involved with their peers' contributions. The team invested 13 days to complete Task 2. Figures 4.11 and 4.12 illustrate the Patterns of Interactions and CW Styles across both tasks adopted by Group 6.



Figure 4.11 A Bar Chart Illustrating a Main Writer Style with One Member Slacked Off (CW Task 1 | Group 6)

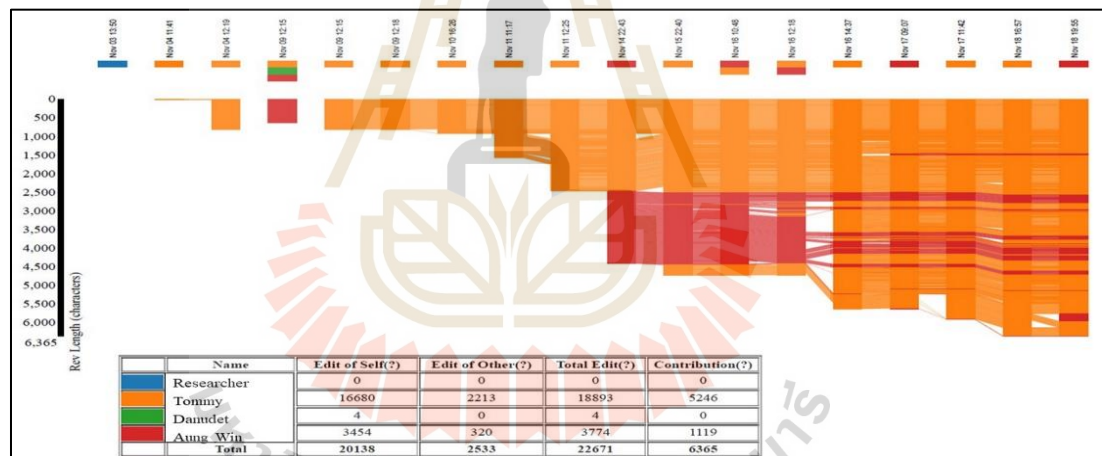


Figure 4.12 A Bar Chart Illustrating a Non-Collaborative Style – One Member Absence (CW Task 2 | Group 6)

Group 6 consisted of three males from Malaysia (Tommy), Myanmar (Aung Win), and Thailand (Danudet). In Task 1, the team spent two weeks to complete their essay. The analysis, completed from a GD history revision revealed that Tommy led the group and was later joined by his peers. However, the members did not interact with each other’s texts. Furthermore, one member withdrew from the group during the CW process.

Text contributed by the member who had slacked off was removed when the team restructured the essay. The group writing behaviour shifted to a main writer style in Task 1 when Tommy dominated the task (73%) and was supported by Aung Win (27%). In Task 2, the CW style remained unchanged: Tommy controlled the writing (82%), and Aung Win shared the other 18%. Danudet failed to join his team in Task 2. Thus, the CW behaviour was considered a failure.

Figures 4.13 and 4.14 show the CW styles and interactions across both tasks adopted by Group 7.

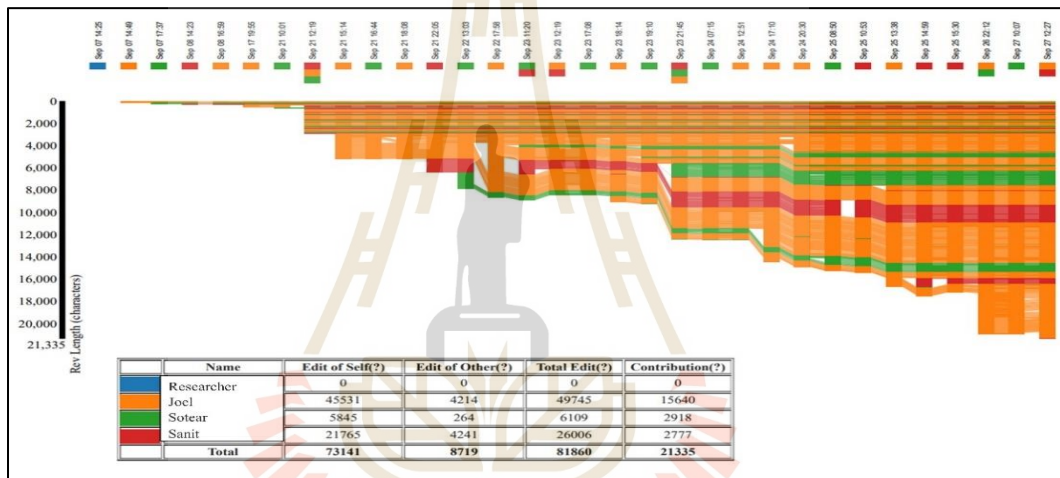


Figure 4.13 A Bar Chart Illustrating a Main Writer Style (CW Task 1 | Group 7)

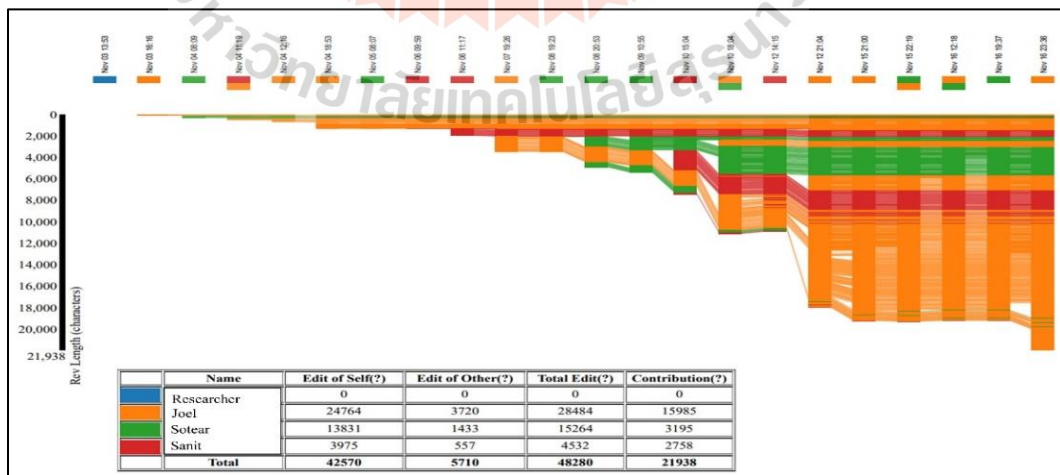


Figure 4.14 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 7)

Group 7 had members from Cambodia (Sotear), the Philippines (Joel), and Thailand (Sanit). In Task 1, the team exhibited a main writer style, in which the CW process spanned nearly three weeks. However, the analysis undertaken from the GD archives showed that the members worked collectively and they interacted with each other's texts. Joel led the team and scaffolded the members throughout the writing process. The interaction pattern can be categorized as, "expert and novice". Although the final contributions from the members was unequal (Joel shared 73%, Sotear 14%, and Sanit 13%), interactions and peer scaffolding were sufficient. Likewise, in Task 2, the CW behaviour remained stable. The team spent 13 days to complete their essay. Joel dominated the work and scaffolded his members. The analysis, completed from the GD history version, showed that Joel revised his peers' texts and gave them comments while texts were edited extensively. The weight of contributions in Task 2 was similar to Task 1: Joel contributed 73%, Sotear, 15%, and Sanit 12%.

Figures 4.15 and 4.16 illustrate the CW styles and interactions across the two CW tasks adopted by Group 8.

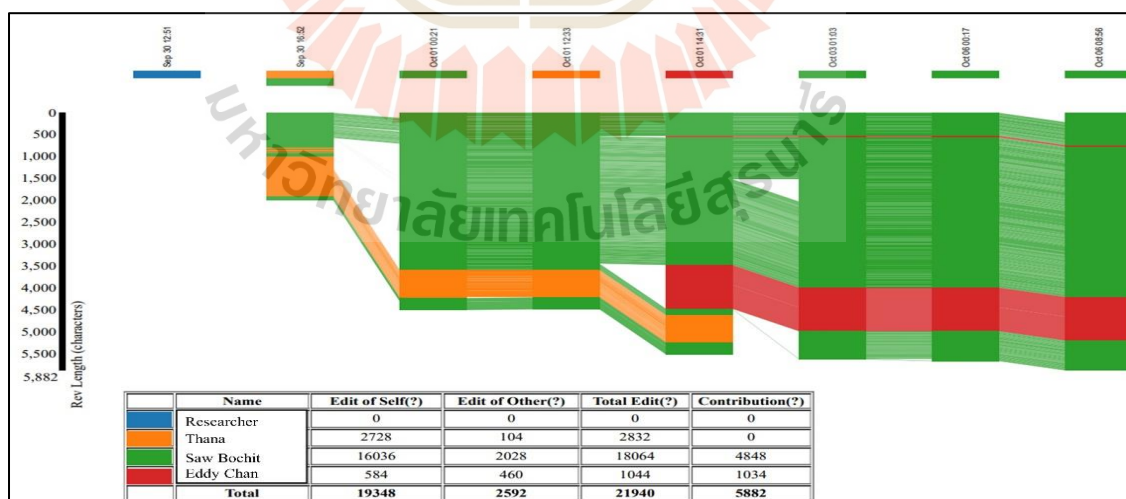


Figure 4.15 A Bar Chart Illustrating a Main Writer Style where One Member Slacked Off (CW Task 1 | Group 8)

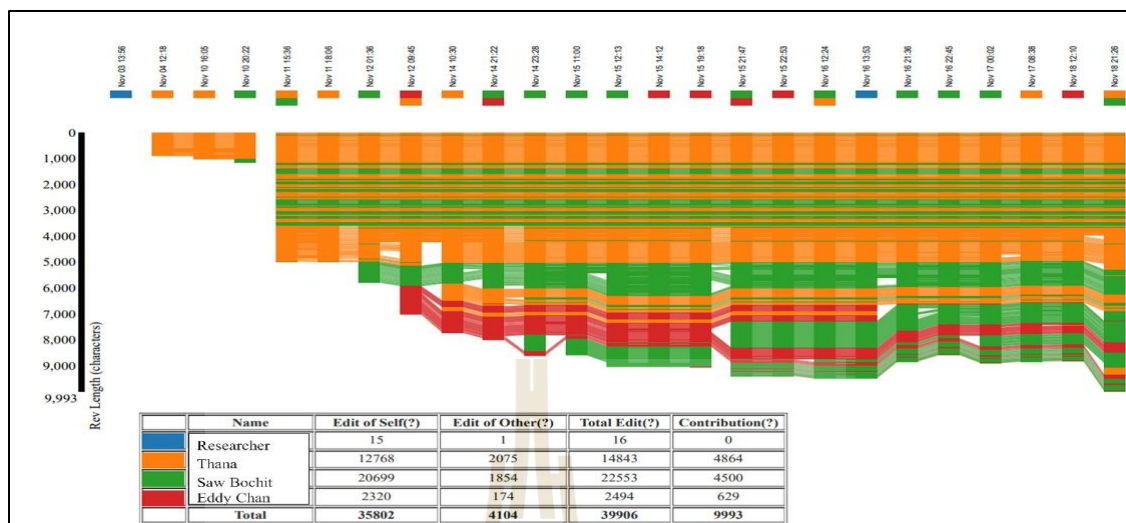


Figure 4.16 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 8)

Group 8 involved male students from Malaysia (Eddy Chan), Myanmar (Saw Bochit), and Thailand (Thana). The team produced a main author style and one member withdrew during Task 1. The CW task spanned six days, although they were given three weeks to complete the task. Analysis revealed that the group divided the workload, but failed to interact with each other's texts. Saw Bochit removed Thana's contribution when he restructured the essay. Eddy composed the last paragraph, and Saw Bochit wrote the conclusion. Thus, two members contributed to the final version of Task 1: Saw Bochit (82%) and Eddy Chan (18%). In Task 2, the group spent two weeks to complete their essay. The CW behaviour remained unchanged when two members took control of the task, but they engaged with each other's texts slightly more than during their first task. However, Eddy Chan rarely interacted with his teammates.

Figures 4.17 and 4.18 illustrate the CW styles and patterns of interaction across both tasks adopted by Group 9.

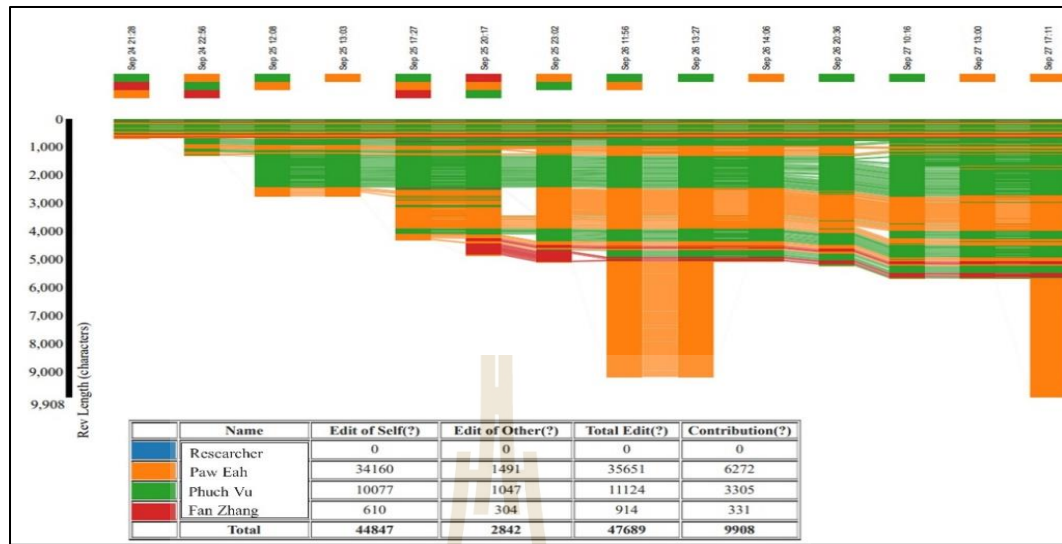


Figure 4.17 A Bar Chart Illustrating a Main Writer Style (CW Task 1 | Group 9)

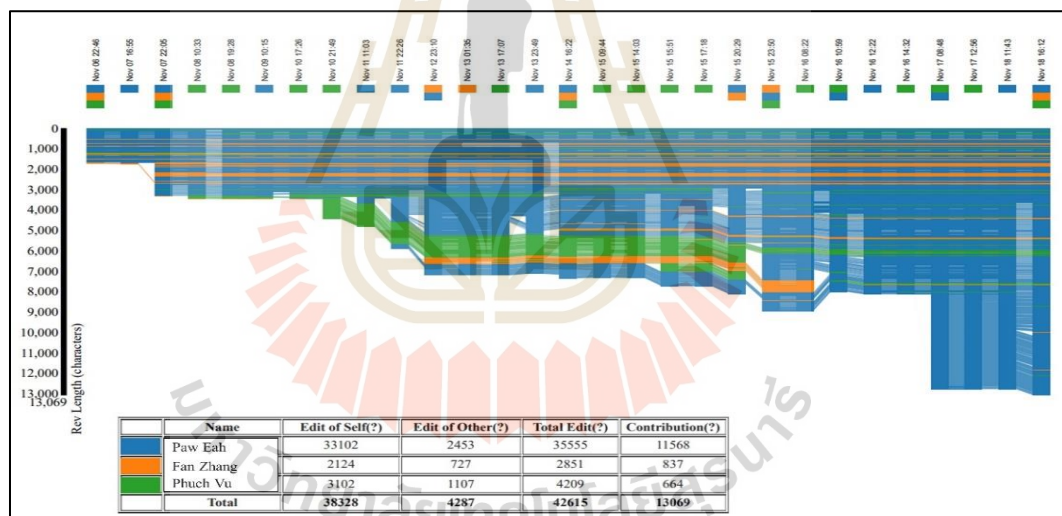


Figure 4.18 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 9)

Group 9 involved one female and two male students. They came from Myanmar (Paw Eah), China (Fan Zhang), and Vietnam (Phuch Vu). The group spent only four days to complete the first task. The members produced a main author style in which one person contributed more than the others did. However, the analysis from GD archives indicated that the team supported each other’s contribution. The team negotiated the topic and divided the workload. Phuch Vu wrote the introduction and the first body paragraph, Paw

Eah added the second and third body paragraphs, and Fan Zhang briefly wrote the conclusion. However, Paw Eah synthesized all the work and revised it in the final draft. Allocation of contributions showed that Paw Eah made 63%, Phuch Vu 34%, and Fan Zhang 3%. In Task 2, the team spent twelve days to complete their essay. The group's writing behaviour did not change. Paw Eah dominated the writing (89%) with minimal help coming from her teammates. However, analysis from the GD archives showed that members engaged on the texts of the others by making comments.

Figures 4.19 and 4.20 show the CW styles and interactions across the two tasks adopted by Group 10.

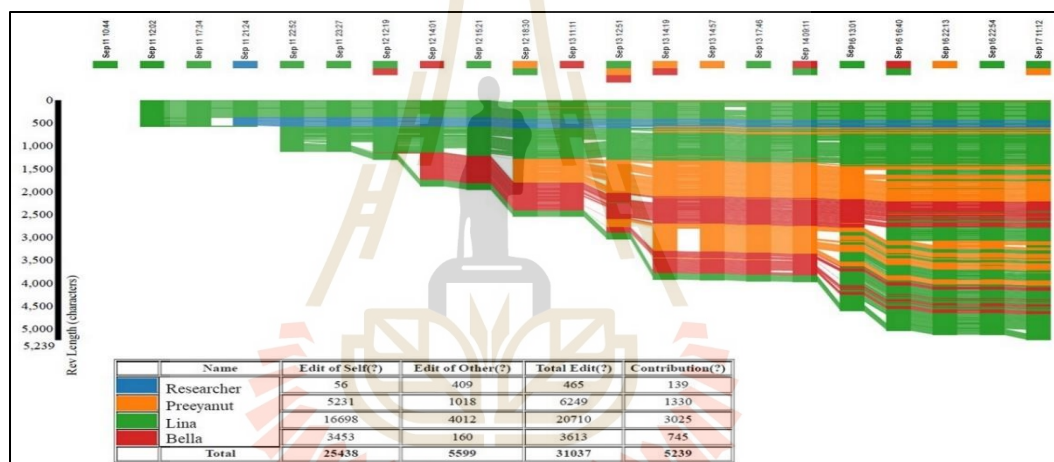


Figure 4.19 A Bar Chart Illustrating a Collaborative Style (CW Task 1 | Group 10)

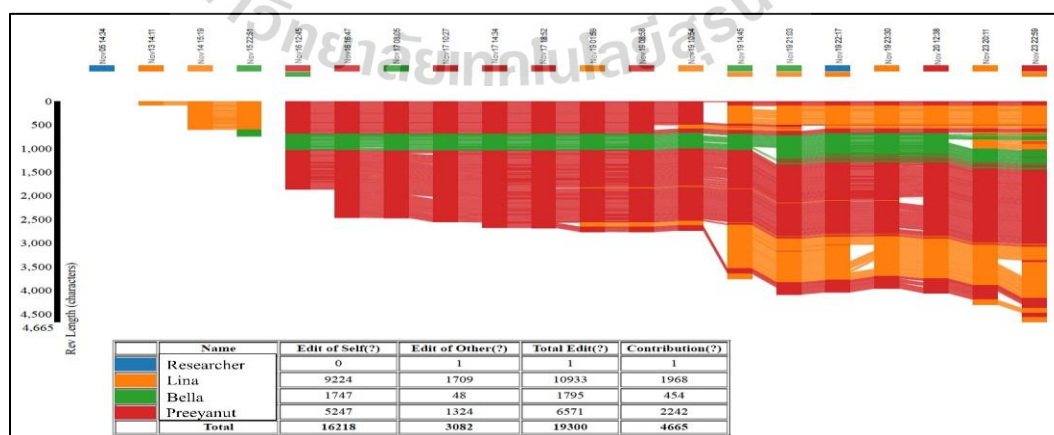


Figure 4.20 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 10)

Group 10 had three members. They were from Malaysia (Lina and Bella) and Thailand (Preeyanut). In Task 1, the team produced a collaborative style, in that members occasionally interacted with their peers' contributions. The group worked for one week to complete the task. The analysis showed that one member (Lina) contributed slightly more than her teammates; however, a review of the GD history revealed that the triad supported each other's texts. The final version was contributed unequally (Lina shared 59%, Preeyanut 26%, and Bella 15%), but the team scaffolded one another to complete their first essay and the interaction pattern was marked as cooperating in parallel. In Task 2, the CW style altered to a main writer style when two members (Preeyanut and Lina) contributed more texts. The team spent 10 days to finish their essay. Although the CW behaviour shifted to a main writer style, the members showed interactions with their peers' texts. The pattern of interaction was relatively similar to their first task when Lina and Preeyanut led the team.

Figures 4.21 and 4.22 show the CW styles and pattern of interactions across the two CW essays for Group 11.

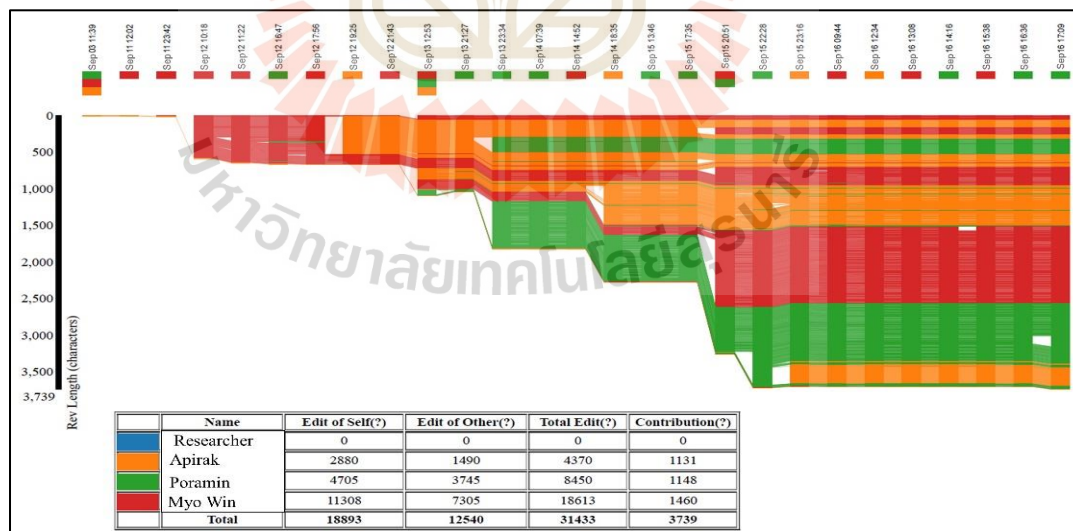


Figure 4.21 A Bar Chart Illustrating a Cooperative Style (CW Task 1 | Group 11)

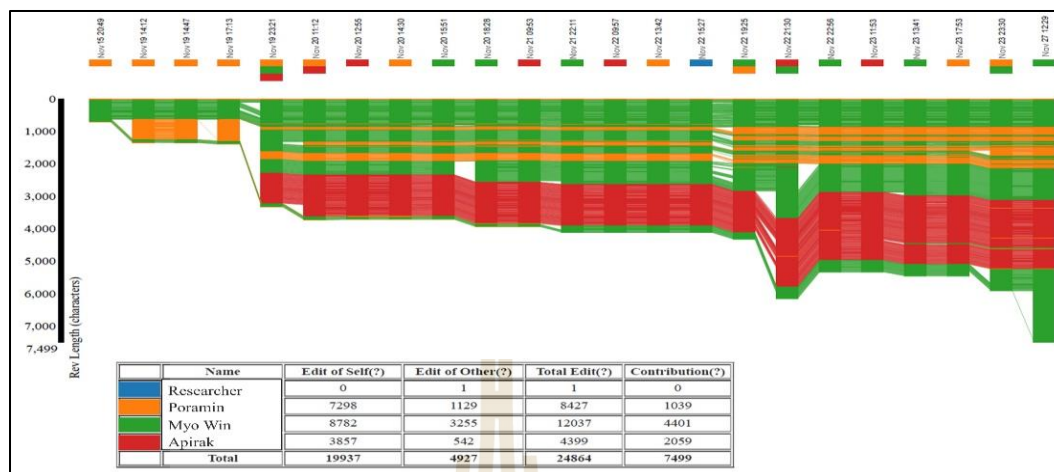


Figure 4.22 A Bar Chart Illustrating a Main Writer Style (CW Task 2 | Group 11)

Group 11 consisted of three male students: one from Myanmar (Myo Win) and two from Thailand (Poramin and Apirak). The team exhibited a cooperative style in Task 1 when the members divided the workload and invested nearly two weeks to complete the work. The members focused mainly on their texts. However, they were seen to interact with each other's text occasionally, particularly between Poramin and Myo Win. The triad contributed the final draft proportionally: Myo Win shared 39%, Poramin 31%, and Apirak 30%. In Task 2, the group CW behaviour shifted to a main writer style when Myo Win contributed more texts than his peers. Analysis from the GD archives of group interaction patterns was marked as "expert and novice" as Myo Win acted as an expert to guide his peers and assisted them with language issues by giving comments and suggestions rather than changing his peers' texts directly. Myo Win contributed 59%, Apirak made 27%, and Poramin 14% to the final draft.

The data from the visualization charts "bottom-up grounded analysis" by DocuViz (Yim et al., 2017) and GD history revision of small groups' interaction patterns and CW styles, can be summarized as shown in Table 4.10.

Table 4.10 Small Groups' Interaction Patterns and CW Styles across Two Tasks

Group	Task 1 (Descriptive Essay)			Task 2 (Argumentative Essay)		
	Interaction Pattern	CW Style	Remarks	Interaction Pattern	CW Style	Remarks
1	Collaborative	Collaborative Style	Group members made equal contribution to the text. The members engaged with each other's text contributions.	Dominant and Defensive	Main Writer Style	Two members contributed more texts, whereas the third member contributed the least to the writing task; however, he made suggestions but received no response from his peers.
2	Cooperating in Parallel	Divide and Conquer Style	Group members wrote their parts and focused on their own sections, but rarely involved themselves with the texts of others.	Cooperating in Parallel	Collaborative Style	Two members contributed more text, whereas one member contributed little. The members were involved with each other's contribution.
3	Cooperating in Parallel	Cooperative Style	Group members made nearly equal contribution to the text. Their engagement with each other's texts was rare. They focused on their own section.	Cooperating in Parallel	Main Writer Style	One member contributed more than the other two did. The members focused on their sections and rarely engaged with other's texts.
4	Dominant and Passive	Main Writer Style	The group consisted of four members. One member controlled the work. Two other members contributed minimally at the final stage, whereas the fourth member failed to participate in the writing task.	Failure I interaction	Non-Collaborative Style	Two members failed to participate in the task. The collaboration failed.

Table 4.10 Small Groups' Interaction Patterns and CW Styles across Two Tasks (Continued)

Group	Task 1 (Descriptive Essay)			Task 2 (Argumentative Essay)		
	Interaction Pattern	CW Style	Remarks	Interaction Pattern	CW Style	Remarks
5	Dominant and Passive	Main Writer Style	One member controlled the task. The other two members contributed minimally. Insufficient evidence was available regarding their engagement with each other's texts.	Dominant and Passive	Main Writer Style	One member controlled the task and led the team. The other two members contributed minimally. The members rarely interacted with each other's texts.
6	Cooperating in Parallel	Main Writer Style	One member contributed more text than the other two. One member withdrew from the group during the CW process and failed to contribute to the final draft.	Failure Interaction	Non-Collaborative Style	One member (same person in Task 1) failed to participate in the task. The collaboration failed.
7	Expert and Novice	Main Writer Style	The three members showed unequal contribution and degrees of control. One member took a role of "expert" and led the other two members. The novices were active and responsive to the leader's comments.	Expert and Novice	Main Writer Style	The team showed unequal contribution and degrees of control. One member took a role of "expert" and led the other two members in a similar manner like the first task. The novices were responsive and active in taking the expert's comments.

Table 4.10 Small Groups' Interaction Patterns and CW Styles across Two Tasks (Continued)

Group	Task 1 (Descriptive Essay)			Task 2 (Argumentative Essay)		
	Interaction Pattern	CW Style	Remarks	Interaction Pattern	CW Style	Remarks
8	Active and Withdrawn	Main Writer Style	Three members were present at the beginning. One member controlled the task, whereas another member who contributed at the beginning withdrew from the group.	Cooperating in Parallel	Main Writer Style	Two members controlled the task and they were occasionally engaged with each other's work. The third member contributed little, and rarely engaged with his peers' texts.
9	Collaborative	Main Writer Style	The members made unequal contribution to the writing task; however, they supported each other's contributions.	Dominant and Passive	Main Writer Style	One member controlled the task, and the other two contributed minimally. The passive contributors showed little engagement with the main author's texts.
10	Cooperating in Parallel	Collaborative Style	One member contributed slightly more than the other two did. The team was involved with each other's contribution.	Dominant and Passive	Main Writer Style	Two members contributed more texts, whereas the other member contributed little. The active contributors supported each other's texts, while the passive writer failed to engage with her peers' text contributions.
11	Cooperating in Parallel	Cooperative Style	The three members made nearly equal contribution to the text. However, they rarely engaged with other's texts but focused on their own part.	Expert and Novice	Main Writer Style	One member contributed more texts than the other two. The team showed some engagement with each other's texts through comments and suggestions.

The findings revealed that there were seven distinctive interaction patterns produced by small groups, namely (1) collaborative, (2) cooperating in parallel (3), dominant and passive, (4) dominant and defensive, (5) expert and novice, (6) active and withdrawn, and (7) failure interaction. With regard to CW styles emerged from “a bottom-up grounded analysis of Docuviz visualizations”, there were five different collaborative styles, which were (1) collaborative style, (2) cooperative style, (3) divide and conquer style, (4) main writer style, and (5) non-collaborative style (absence of members).

With regard to the patterns of interaction and CW styles emerging from the analysis, their frequencies are summarized in Figure 4.23 in terms of percentages.

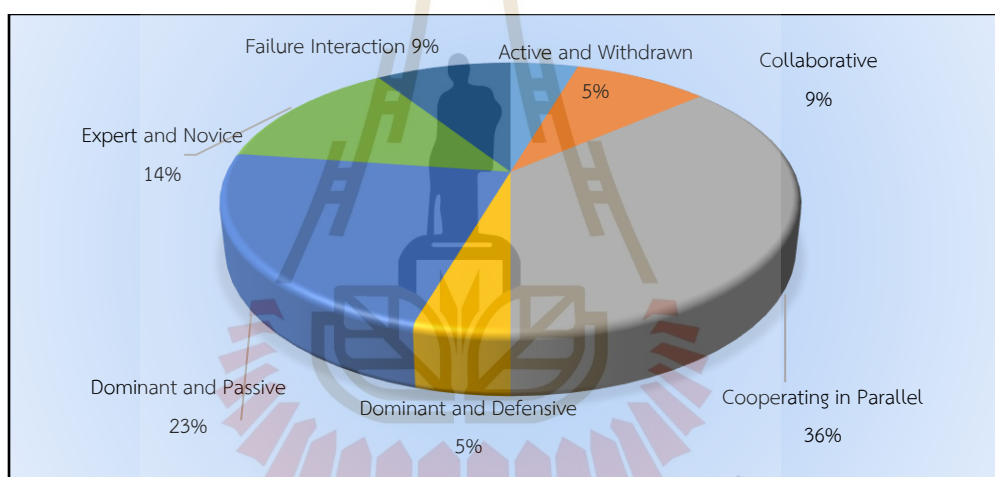


Figure 4.23 Frequency of Observed Interaction Patterns

From the findings, the interaction patterns “cooperating in parallel” was used most by the participants (36%), followed by “dominant and passive” (23%), and “expert and novice” (14%), whereas “dominant and defensive” and “active and withdrawn” were used the least (5% each). Of the eleven groups performing the CW tasks, two groups failed to interact with each other due to member’s absence while attempting Task 2. Such failed interaction accounted for 9% for the observed patterns. Learners were found to exhibit five different CW styles from the DocuViz analysis. Their frequencies are summarized in Figure 4.24.

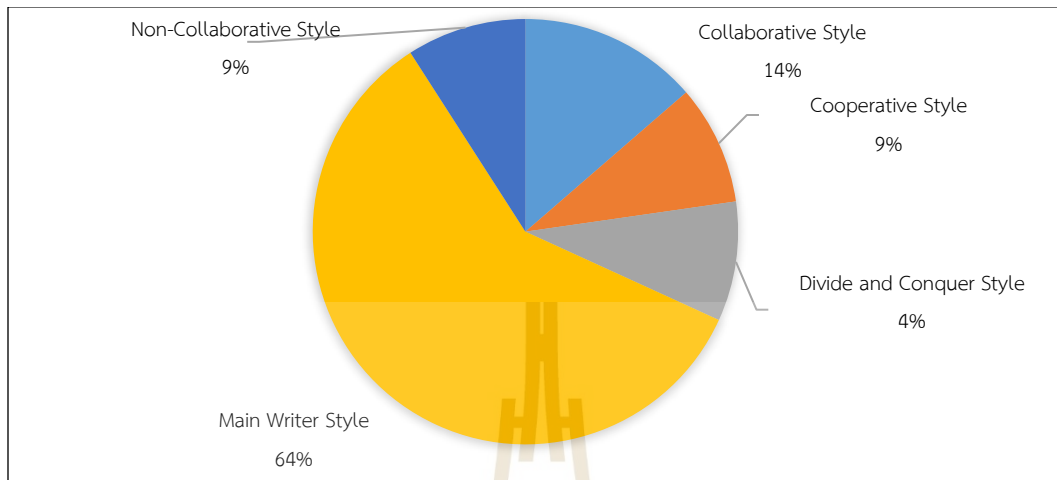


Figure 4.24 Frequency of Observed CW Styles

Of the five CW styles identified from a bottom-up grounded analysis, the main writer style was used most (64%), followed by collaborative styles (14%), and cooperative style (9%). Divide and conquer style was used the least (4%), whereas a non-collaborative style was shown by Groups 4 and 6 in their second task, which accounted for 9% of activities. In the following subsection learners' contributions towards CW tasks are commented upon.

4.2.2 Learners in Small Groups' Weight of Contributions

In light of learners' contributions in small group CW tasks, the findings from the analysis of DocuViz are summarized in Table 4.11.

Table 4.11 Learners in Small Groups Contributions to CW Tasks

Group	Pseudonym	Login attempts		Edit of self (no. of characters)		Edit of others (no of characters)		Total edits (no. of characters)		Proportion of contribution (no. of character)		Percentage of contribution to the final draft	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
1	Den	4	1	3,369	474	1,044	132	4,412	606	1,918	447	34	10
	Sunny	5	2	3,924	2,869	159	2	4,083	2,871	1,857	2,110	33	46
	Jessy	4	1	3,880	2,339	152	256	4,032	2,595	1,874	1,998	33	44
2	Li Chun	8	19	4,280	13,710	360	2,122	4,640	15,832	1,229	2,631	28	37
	Naw Joy	5	3	3,472	2,522	21	3	3,493	2,525	1,101	311	25	4
	Riah	2	12	1,089	15,008	1,139	2,345	2,228	17,353	829	2,694	19	38
	Troy	4	8	1,756	3,207	508	2,907	2,264	6,114	1,260	1,527	29	21
3	Ming Jie	5	9	6,550	22,841	198	4,373	6,748	27,214	2,256	4,377	41	57
	Zhu Lue	4	4	2,796	14,349	27	9,192	2,823	23,541	1,664	1,873	30	24
	Tranh Vy	4	10	5,300	8,730	92	5,132	5,392	13,862	1,546	1,488	28	19
4	Rajani	18	20	12,388	36,191	3	4,567	12,391	40,758	4,175	7,109	83	90
	Jaisin	3	0	1,137	0	301	0	1,438	0	367	0	7	0
	Krist	2	0	824	0	266	0	1,090	0	470	0	10	0
	Daniel Zim	0	16	0	10,976	0	1,284	0	12,260	0	807	0	10
5	Raimonds	8	14	1,609	4,339	141	2,084	1,750	6,423	175	918	2	12
	Fadri	1	2	1,427	4,385	58	128	1,485	4,513	1,269	718	16	9
	Sopheha	11	14	12,342	21,245	446	2,539	12,788	23,784	6,395	5,998	82	79
6	Aung Win	6	6	3,101	3,454	5	320	3,106	3,774	1,136	1,119	27	18
	Danudet	1	1	957	4	22	0	979	0	7	0	0	0
	Tommy	9	14	8,193	16,680	1,290	2,213	9,483	18,893	3,125	5,246	73	82
7	Joel	16	11	45,531	24,764	4,214	3,720	49,745	28,484	15,640	15,985	73	73
	Sotear	13	9	5,845	13,831	264	1,433	6,109	15,264	2,918	3,195	14	15
	Sanit	10	5	21,765	3,975	4,241	557	26,006	4,532	2,777	2,758	13	13
8	Thana	2	9	2,728	12,768	104	2,075	2,832	14,843	0	4,864	0	49
	Saw Bochit	5	13	16,036	20,699	2,028	1,854	18,064	22,553	4,848	4,500	82	45
	Eddy Chan	1	7	584	2,320	460	174	1,044	2,494	1,034	629	18	6
9	Paw Eah	11	16	34,160	33,102	1,491	2,453	35,651	35,555	6,272	11,568	63	89
	Phuch Vu	11	19	10,077	3,102	1,047	1,107	11,124	4,209	3,305	664	34	5
	Fan Zhang	4	8	610	2,124	304	727	914	2,851	331	837	3	6
10	Preeyanut	6	10	5,231	5,247	1,018	1,324	6,249	6,571	1,330	2,242	26	48
	Lina	14	10	16,698	9,224	4,012	1,709	20,710	10,933	3,025	1,968	59	42
	Bella	7	5	3,453	1,747	160	48	3,613	1,795	745	454	15	10
11	Apirak	5	7	2,880	3,857	1,490	542	4,370	4,399	1,131	2,059	30	27
	Poramin	12	7	4,705	7,298	3,745	1,129	8,450	8,427	1,148	1,039	31	14
	Myo Win	10	10	11,308	8,782	7,305	3,255	18,613	12,037	1,460	4,401	39	59

To further examine if there was any correlation between learners' contributions on group work and their post-test writing, Pearson's Product Moment Correlation Coefficient (Pearson's r) was used to analyze the data, the results are shown in Table 4.12.

Table 4.12 Correlation between Learners Contribution to CW Tasks and Writing Performance.

Variable	Descriptive Statistics			Correlation	
	N	M	SD	Text Contributions (%)	Writing Performance
Text Contributions (%)	35	31.45	24.56	–	.418*
Writing Performance	35	74.28	10.09	.418*	–
R^2					.175
R^2 Adjusted					.150
β					.418
F					6.979

Note. * Correlation is significant at the .05 level (2-tailed) ($p = .013$)

The analysis revealed that there was a significantly moderate positive correlation between percentage of text contributions and learners' writing performance ($r(33) = .418, p < .05$). A significant linear regression equation was found ($F(1, 33) = 6.979, p < .05$) with an R^2 Adjusted of .150. This indicated that learners in small groups who contributed more texts in their CW task were the ones likely to perform better in their post-test writing. In other words, as learners increased their engagement in text contribution, their writing skills subsequently improved. From the regression analysis, the percentage of contributions can predict 15% of the post-test writing scores. In the following section, Research Question 3 is discussed.

4.3 Answer to Research Question 3

What are the writing change functions and language functions used in collaborative writing when learners are engaged in writing tasks?

To respond to Research Question 3, the current researcher examined written texts learners co-constructed by investigating their CW performances in GD files, and scanned through GD archives and the comments window to observe their use of WCFs and LFs. To establish inter-rater reliability, the current researcher trained an English teacher in the faculty who had some experience and skills in coding qualitative data to assist in the coding process (data on WCFs and LFs produced by small groups). At the initial stage of data coding, the researcher worked face-to-face with the trained teacher for four hours. Once the trainee became familiar with the system of coding, she could work independently. The inter-rater reliability for both codings (WCFs and LFs inter-coded by the researcher and his colleague of about 20%) were calculated and the score obtained was 88%. The WCFs and LFs employed by small groups are discussed in the following pages.

4.3.1 WCFs Employed by Small Groups

WCFs refer to adding of ideas into texts, expanding or reordering of ideas, making a correction on errors or deleting them, or rephrasing texts by changing the position of words or phrases to improve the quality of writing. The findings from the data analysis of WCFs by the small groups are shown in the frequency counts given in Table 4.13.

Table 4.13 Writing Change Functions Employed by Small Groups in CW Tasks

Group	Psydonym	Writing Change Functions																			
		Adding				Correcting				Deleting				Reordering				Rephrasing			
		T1		T2		T1		T2		T1		T2		T1		T2		T1		T2	
S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O		
G1	Den	4	3	1	1	3	4	0	1	3	2	0	2	4	1	0	1	0	0	0	0
	Sunny	5	0	2	0	2	1	0	0	2	1	1	0	1	0	1	0	0	0	0	0
	Jessy	6	1	2	0	2	0	1	0	4	0	0	1	2	1	0	0	1	0	0	0
	Total	15	4	5	1	7	5	1	1	9	3	1	3	7	2	1	1	1	0	0	0
G2	Riah	3	1	9	2	4	0	6	2	2	1	5	1	0	0	2	9	2	0	5	2
	Li Chun	6	3	14	6	4	4	7	2	2	2	8	3	3	2	2	1	2	0	10	2
	Naw Joy	6	1	2	0	6	0	2	0	4	0	1	0	1	0	0	0	2	0	2	0
	Troy	2	3	6	2	2	4	2	2	0	1	0	2	0	0	0	1	3	4	4	2
Total	17	8	31	10	16	8	17	6	8	4	14	6	4	2	4	11	9	4	21	6	
G3	Ming Jie	7	0	9	0	6	0	2	0	4	0	4	2	2	0	5	0	0	0	0	1
	Zhu Lue	4	2	8	0	4	2	0	0	3	1	5	0	2	0	0	4	0	0	4	0
	Tranh Vy	4	1	5	0	7	2	2	0	3	0	2	0	2	1	0	1	0	0	5	0
	Total	15	3	22	0	17	4	4	0	10	1	11	2	6	1	5	5	0	0	9	1
G4	Rajani	21	0	23	4	21	1	12	2	7	0	10	3	0	0	2	0	19	0	8	3
	Krist	3	4	0	0	3	3	0	0	2	2	0	0	0	0	0	0	1	1	0	0
	Jaisin	3	2	0	0	2	5	0	0	1	1	0	0	0	0	0	0	1	5	0	0
	Daniel Zim	0	0	2	1	0	0	5	0	0	0	1	0	0	0	0	0	0	0	2	0
Total	27	6	25	5	26	9	17	2	10	3	11	3	0	0	2	0	21	6	10	3	
G5	Raimonds	2	3	3	3	1	0	4	3	3	1	0	2	0	0	0	0	0	1	1	2
	Sophea	27	0	15	4	3	0	6	4	5	3	4	2	5	0	2	0	10	1	8	4
	Fadri	2	0	6	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	3	0
	Total	31	3	24	7	4	0	11	7	9	4	6	4	5	0	2	0	10	2	12	6
G6	Tommy	14	4	15	3	6	0	8	2	6	0	3	2	0	0	0	1	6	3	6	3
	Aung Win	6	0	3	1	3	0	2	2	3	1	1	0	1	0	0	0	5	0	3	1
	Danudet	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
	Total	22	4	18	4	9	0	10	4	10	1	4	2	1	0	0	1	12	3	9	4

Table 4.13 Writing Change Functions Employed by Small Groups in CW Tasks (Continued)

Group	Pseudonym	Writing Change Functions																			
		Adding				Correcting				Deleting				Reordering				Rephrasing			
		T1		T2		T1		T2		T1		T2		T1		T2		T1		T2	
S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O		
G7	Joel	15	11	17	9	6	4	2	2	12	6	7	2	10	5	3	1	7	6	12	8
	Sotear	10	0	9	1	6	1	2	1	5	0	3	0	5	0	4	0	1	1	0	0
	Sanit	14	1	6	0	6	1	3	0	7	1	4	0	5	1	1	0	2	0	2	0
	Total	39	12	32	10	18	6	7	3	24	7	14	2	20	6	8	1	10	7	14	8
G8	Thana	7	0	11	1	3	0	4	0	2	1	3	1	3	0	2	0	0	0	5	1
	So Bochit	15	11	20	5	10	2	11	3	6	3	12	2	5	7	3	1	0	2	6	4
	Eddy Chan	1	1	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
	Total	23	12	33	6	13	2	15	3	8	5	16	3	8	7	5	1	0	2	11	5
G9	Paw Eah	18	1	24	3	10	5	12	1	7	1	10	3	5	2	4	2	3	3	16	5
	Phuch Vu	12	4	14	2	8	5	4	8	3	3	4	2	3	4	0	0	3	1	5	3
	Fan Zhang	2	1	6	2	0	2	2	3	0	0	2	0	0	0	1	0	0	3	3	1
	Total	32	6	44	7	18	12	18	12	10	4	16	5	8	6	5	2	6	7	24	9
G10	Preeyanut	9	3	8	1	5	1	6	5	2	0	3	1	2	0	0	0	6	1	5	2
	Lina	12	7	16	1	10	2	7	1	8	1	6	1	0	0	0	0	8	4	6	1
	Bella	9	0	3	0	4	0	3	0	4	0	2	0	0	0	1	0	6	0	3	0
	Total	30	10	27	2	19	3	16	6	14	1	11	2	2	0	1	0	20	5	14	3
G11	Poramin	10	7	14	0	10	3	8	2	6	2	4	0	1	0	2	0	3	1	6	0
	Myo Win	18	1	15	1	6	2	9	0	9	0	7	1	1	0	2	0	3	0	7	0
	Apirak	9	2	7	1	6	1	5	1	2	0	6	0	0	0	1	0	3	0	4	0
	Total	37	10	36	2	22	6	22	3	17	2	17	1	2	0	5	0	9	1	17	0

Note. T1= Task 1; T2= Task 2; S= Self; O= Other

From the analysis shown in Table 4.13, Group 1 produced 53 WCFs in Task 1 and 14 in Task 2. The most frequently writing change acts used by the team in the first task was adding (35.8%), followed by correcting and deleting (22.6% each). The least used WCFs was rephrasing (1.9%). In Task 2, the members drastically withdrew their contributions on WCFs. The three members combined made only 14 writing change acts. From the analysis, the most frequently writing change act produced by the team from the two tasks combined was adding (37.3%), followed by deleting (23.8%), whereas the least used WCFs was rephrasing (1.5%). The frequency counts of WCFs produced by Group 1 is summarized in Figure 4.25.

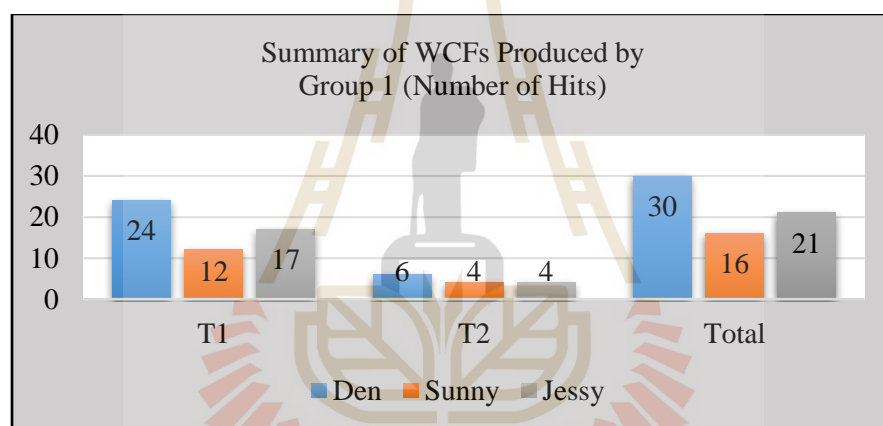


Figure 4.25 Number of WCFs Produced by Group 1

Group 2 produced 80 WCFs in Task 1 and 126 acts in Task 2. The most frequently writing change acts used by the team in Task 1 were adding (31.3%) followed by correcting (30%). The least employed WCFs was reordering (7.5%). In Task 2, the team used 41 acts of adding, 27 acts of rephrasing, 23 acts of correcting, and reordering was used the least in Task 2 (15 acts). From the analysis, the most frequently WCFs produced by the group from the two tasks combined was adding (32%), followed by correcting (22.8%), whereas the least used writing change act was reordering (10.2%). The frequency counts of WCFs produced by Group 2 are summarized in Figure 4.26.

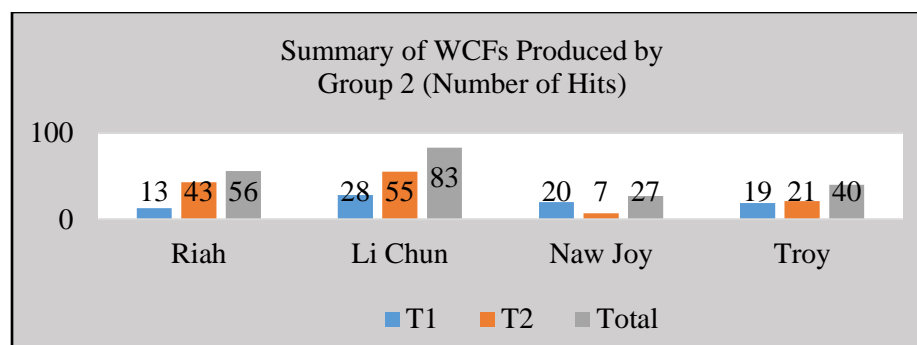


Figure 4.26 Number of WCFs Produced by Group 2

Group 3 generated 57 WCFs in Task 1 and 59 acts in Task 2. The most frequently writing change acts used by the team in Task 1 were correcting (21 acts) followed by adding (18 acts), and the members did not use any rephrasing in Task 1. In Task 2, the team produced 22 acts of adding, 13 acts of deleting, 10 acts of reordering and rephrasing each, and correcting was used the least (4 acts). From the analysis, the most frequently WCFs produced by the team from the two tasks combined was adding (34.5%) followed by correcting (21.5%), whereas the least used WCFs was rephrasing (8.6%). The frequency counts of WCFs produced by Group 3 is summarized in Figure 4.27.

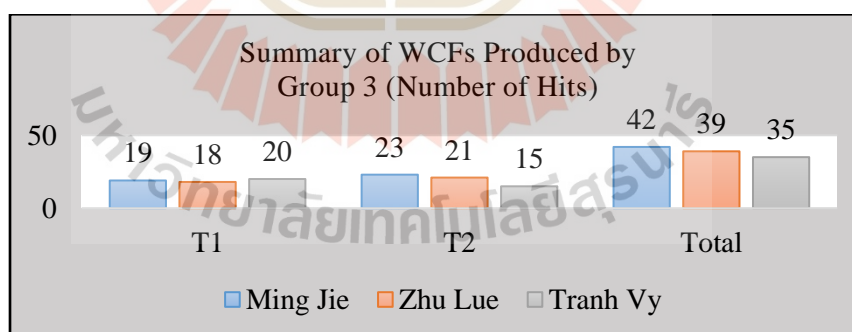


Figure 4.27 Number of WCFs Produced by Group 3

Group 4 employed 108 WCFs in Task 1 and 78 acts in Task 2. However, Rajani produced most WCFs (73%) from both tasks combined. The most frequently WCFs used by the team in Task 1 was correcting (32.4%), followed by adding and rephrasing (30.6% and 25% respectively). In Task 2, the most frequently WCFs used was adding (38.4%),

followed by correcting (24.3%) and deleting (18%). From the analysis, the most WCFs produced by the group from both tasks combined was adding (34%) followed by correcting (29%), whereas the least employed WCFs was reordering (1%). The frequency counts of WCFs produced by Group 4 are summarized in Figure 4.28.

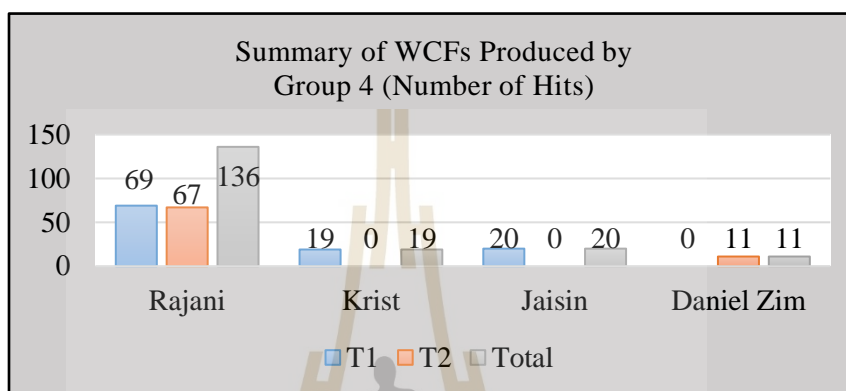


Figure 4.28 Number of WCFs Produced by Group 4

Group 5 produced 68 WCFs in Task 1 and 79 acts in Task 2. Sophea made the most contribution in WCFs in both tasks (79.4% in Task 1 and 62% in Task 2), whereas Fadri made the least contribution (4.4% in Task 1 and 15.2% in Task 2). From the analysis, the most frequently WCFs produced by the team from the two tasks combined was adding (44.2%) followed by rephrasing (20.4%), whereas the least used writing change act was reordering (4.7%). The frequency counts of WCFs produced by Group 5 are summarized in Figure 4.29.

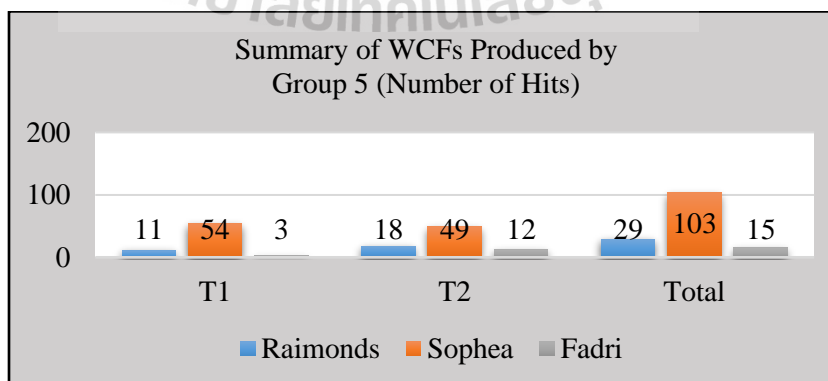


Figure 4.29 Number of WCFs Produced by Group 5

Group 6 used 62 WCFs in Task 1 and 56 acts in Task 2. The most frequently WCFs used by the team in Task 1 was adding (42%), followed by rephrasing (24.2%). The least employed act was reordering (1.6%). Likewise, in Task 2 adding was used most frequently (39.3%), followed by correcting (25%) and rephrasing (23.2%). From the analysis, the most frequently writing change acts produced from both tasks combined involved adding (40.7%), followed by rephrasing (23.7%), whereas the least employed WCFs from both tasks combined was reordering (1.7%). The frequency counts of WCFs produced by Group 6 are summarized in Figure 4.30.

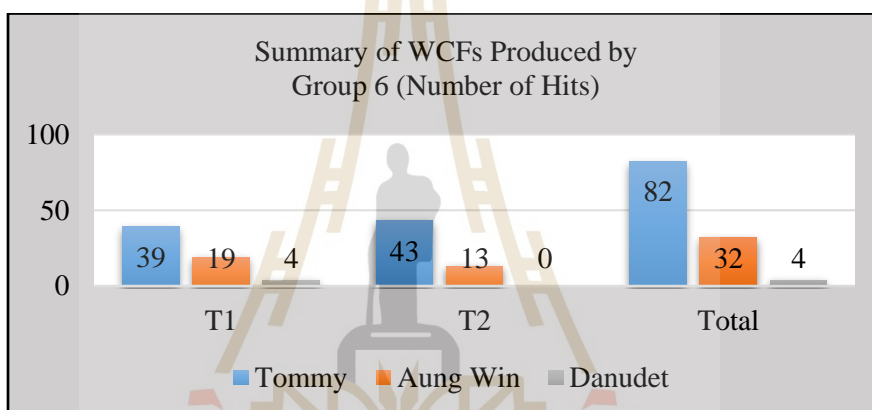


Figure 4.30 Number of WCFs Produced by Group 6

Group 7 generated 149 WCFs in Task 1 and 99 acts in Task 2. The most frequently writing change acts used by the team in Task 1 was adding (34.2%), followed by deleting (20.8%) and reordering (17.4%). The least used act was rephrasing (11.4%). Likewise, in Task 2, adding was used the most (42.4%), followed by rephrasing (22.2%), whereas reordering was used the least (9 %). From the analysis, the most frequently WCFs produced by the team from both tasks combined was adding (37.5%), followed by deleting (19%) and rephrasing (15.7%). The frequency counts of WCFs produced by Group 7 are given in Figure 4.31.

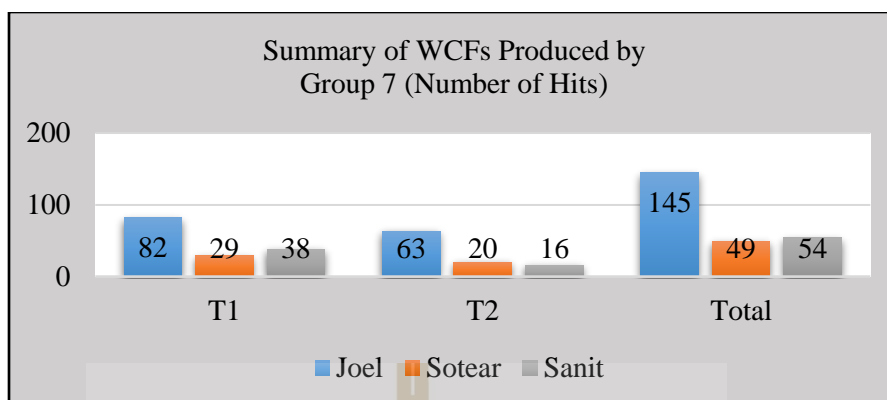


Figure 4.31 Number of WCFs Produced by Group 7

Group 8 generated 80 WCFs in Task 1 and 98 in Task 2. The most frequently act used in Task 1 was adding (43.8%), followed by correcting and reordering (18.8% each). The least used WCFs in Task 1 was rephrasing (2.5%). Likewise, Task 2, adding was used the most (40%), followed by deleting (19.4%), and correcting (18.4%), whereas reordering was used the least (6.2%). From the analysis, the most frequently WCFs produced from both tasks combined was adding (41.5%), followed by correcting (18.5%), whereas the least used act was rephrasing (10%). The frequency counts of WCFs produced by Group 8 are given in Figure 4.32.

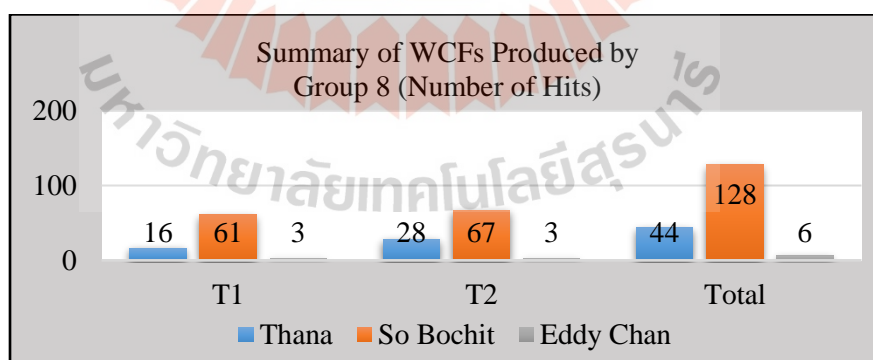


Figure 4.32 Number of WCFs Produced by Group 8

Group 9 employed 109 WCFs in Task 1 and 142 acts in Task 2. The most frequently WCFs used in Task 1 was adding (35%) followed by correcting (27.5%). The least used act was rephrasing (12%). Likewise, in Task 2, adding was used the most (36%),

followed by rephrasing (23.2%), and correcting (21%), whereas reordering was used the least (5 %). From the analysis, the most acts produced from the two tasks combined were adding (35.5%), followed by correcting (24%), and rephrasing (18.3%), whereas the least used writing change act was reordering (8.4%). The frequency counts of WCFs produced by Group 9 are summarized in Figure 4.33.

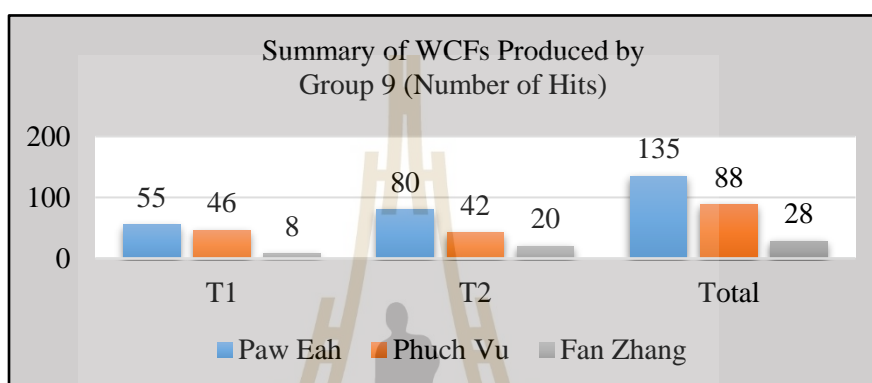


Figure 4.33 Number of WCFs Produced by Group 9

Group 10 used 104 WCFs in Task 1 and 82 acts in Task 2. The most frequently WCFs used in Task 1 was adding (38.4%), followed by rephrasing (24%). The least used WCFs was reordering (2%). Likewise, in Task 2, adding was used the most (35.4%), followed by correcting (26.8%), and rephrasing (20.7%), whereas reordering was used the least (1.2%). From the analysis, the most frequently WCFs produced from both tasks combined were adding (37 %), followed by correcting (23.7%), whereas the least used act was reordering (1.6%). The frequency counts of WCFs produced by Group 10 are given in Figure 4.34.

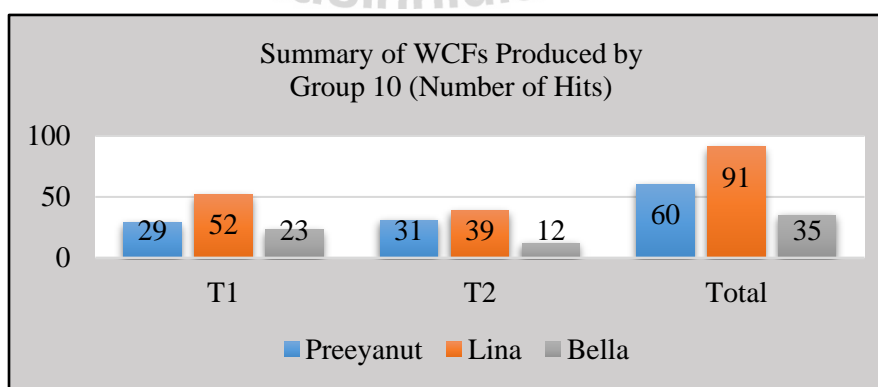


Figure 4.34 Number of WCFs Produced by Group 10

Group 11 generated 106 WCFs in Task 1 and 103 acts in Task 2. The most frequently WCFs used in Task 1 was adding (44.3%), followed by correcting (26.4%), whereas the least used act was reordering (2%). In Task 2, the team produced 38 acts of adding (36.9%), 25 acts of correcting (24.3%), and reordering was used the least (4.8%). From the analysis, the most frequently WCFs produced by the team from both tasks combined was adding (40.7%), whereas the least used act was reordering (3.3%). The frequency counts of WCFs produced by Group 11 are shown in Figure 4.35.

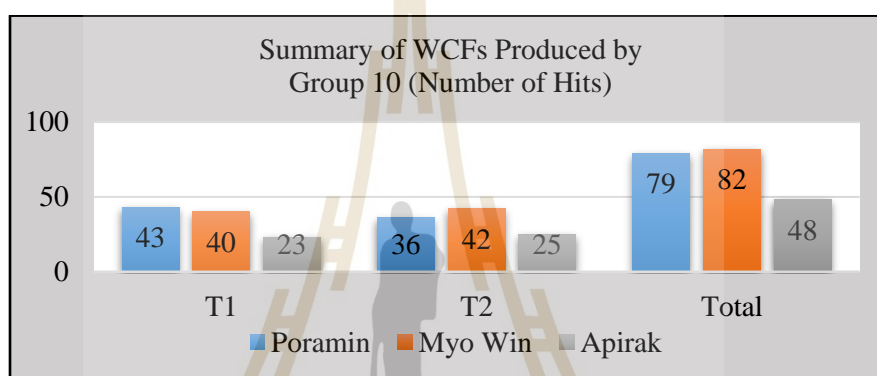


Figure 4.35 Number of WCFs Produced by Group 11

In conclusion, learners in small groups employed various types of WCFs while co-constructing their CW tasks on descriptive and argumentative essays. The use of WCFs implied that learners were involved in the recursive writing process. The overall percentages of WCFs used by all small groups combined were calculated and are summarized in Figure 4.36.

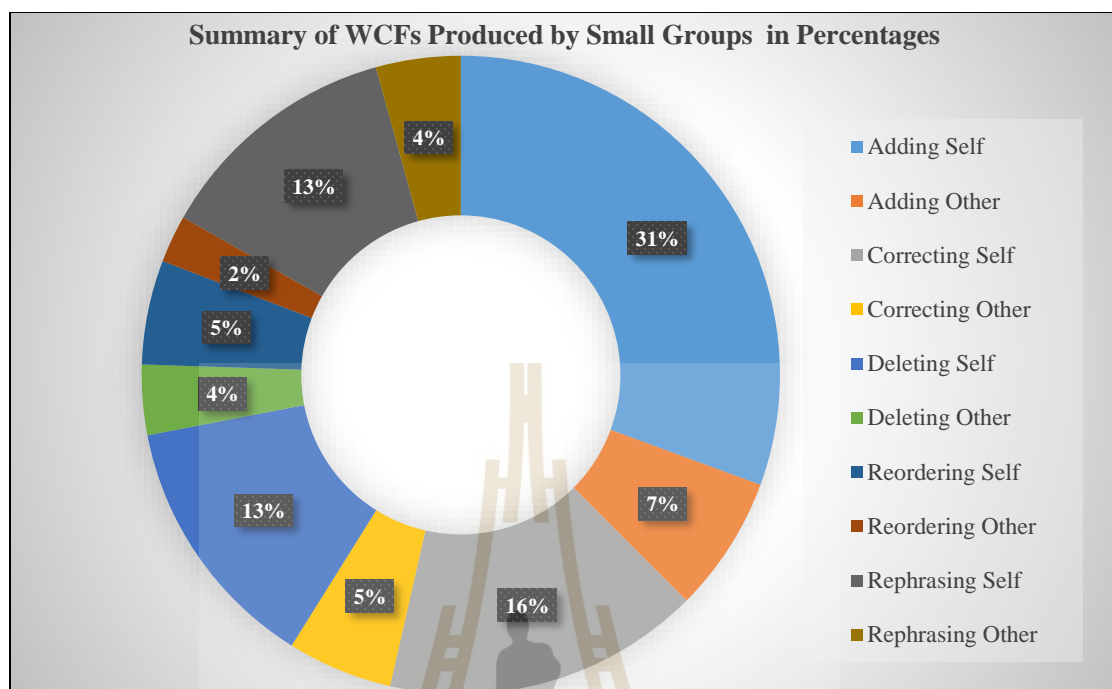


Figure 4.36 Overall Percentages of WCFs Produced by Small Groups

As seen in Figure 4.36, adding to self text was the WCFs most frequently used by the participants, accounted for 31%, followed by correcting self (16%), and deleting self and rephrasing self (accounted for 13% each). The least used WCFs among the participants was reordering the contributions of others (2%). This implied that when jointly constructing an essay, learners would render or dedicate more time to look at their own sections or texts than revise or edit the work of peers. In the following subsection, learners' use of LFs is reported.

4.3.2 LFs Employed by Small Groups in CW Tasks

LFs support learners in small groups while performing CW tasks. Employing a variety of LFs, learners could negotiate or interact with one another to complete tasks on time (see definitions and examples of LFs in 2.4 of Chapter 2). LFs produced by members in small groups were retrieved from the GD comment history. The analysis of frequency of LFs produced by small groups are summarized in Table 4.14.

Table 4.14 Frequency Counts of Language Functions Employed by Small Groups

		Language Functions																					
Group	Pseudonym	Initiating												Responding									
		Eliciting		Greeting		Justifying		Questioning		Requesting		Stating		Suggesting		Acknowledging		Agreeing		Disagreeing		Elaborating	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
G1	Den	0	0	0	0	0	0	0	0	0	2	0	3	3	1	1	0	0	0	0	0	1	0
	Sunny	1	0	0	0	0	0	1	0	0	0	1	0	0	4	2	0	0	0	0	0	0	0
	Jessy	5	1	0	0	0	0	0	0	0	0	4	1	2	0	1	0	3	0	0	0	0	0
	Total	6	1	0	0	0	0	1	0	0	0	3	4	4	9	3	2	0	3	0	0	0	1
G2	Riah	3	2	3	5	0	0	0	0	4	3	2	5	3	1	1	0	2	2	0	0	0	1
	Li Chun	4	5	0	3	0	0	0	1	0	1	1	7	6	4	1	1	2	2	0	0	0	0
	Naw Joy	0	0	0	0	0	0	0	0	0	0	0	3	2	0	2	1	3	2	1	0	0	0
	Troy	1	0	0	0	0	0	2	0	0	0	1	0	3	0	1	0	1	1	1	0	1	0
Total	8	7	3	8	0	0	2	1	4	4	4	15	14	5	5	2	8	7	2	0	1	1	
G3	Ming Jie	0	0	0	0	0	0	0	0	0	0	2	6	0	3	4	0	0	1	0	0	0	1
	Zhu Lue	0	3	0	0	0	0	0	1	1	3	0	8	6	5	1	3	0	4	0	0	0	1
	Tranh Vy	0	2	0	1	0	1	0	0	0	0	2	5	2	2	2	0	0	5	0	0	0	0
	Total	0	5	0	1	0	1	0	1	1	3	4	19	8	10	7	3	0	10	0	0	0	2
G4	Rajani	2	3	1	3	0	0	0	0	1	7	2	8	10	6	0	1	3	2	0	0	3	2
	Krist	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0
	Jaisin	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0
	Daniel	0	1	0	1	0	0	0	0	0	0	1	0	2	0	0	1	0	2	0	0	0	1
Total	7	4	1	4	0	0	0	0	1	8	2	10	11	6	1	2	8	4	0	0	3	3	
G5	Raimonds	1	3	0	0	0	0	0	0	0	0	0	3	1	2	0	1	4	3	0	0	1	4
	Sophea	0	0	0	1	2	0	0	0	2	1	2	6	3	7	0	1	1	3	0	0	0	2
	Fadri	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	Total	2	5	0	1	2	0	0	0	2	1	2	9	4	9	0	2	5	7	0	0	1	6

Table 4.14 Frequency Counts of Language Functions Employed by Small Groups (Continued)

		Language Functions																					
Group	Psydonym	Initiating												Responding									
		Eliciting		Greeting		Justifying		Questioning		Requesting		Stating		Suggesting		Acknowledging		Agreeing		Disagreeing		Elaborating	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
G6	Tommy	1	3	0	1	0	0	0	1	0	2	1	3	3	1	1	0	1	0	0	0	0	2
	Aung Win	0	0	0	1	0	0	0	0	0	0	2	2	1	0	2	0	0	2	0	0	0	0
	Danudet	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Total	1	3	0	2	0	0	0	1	0	2	4	5	4	1	3	0	1	2	0	0	0	2
G7	Joel	6	3	8	2	0	0	0	3	6	8	9	10	8	3	6	1	3	1	1	3	3	4
	Sotear	0	2	2	2	0	0	3	0	0	3	1	3	1	0	1	1	5	2	0	0	1	0
	Sanit	3	0	2	0	0	0	0	1	1	0	1	1	0	0	1	0	8	1	0	0	1	0
	Total	9	5	12	4	0	0	3	4	7	11	11	14	9	3	8	2	16	4	1	3	5	4
G8	Thana	0	7	0	1	0	0	0	0	0	0	1	5	1	5	0	2	0	4	0	0	0	2
	So Bochit	0	5	1	4	0	0	1	2	0	0	0	7	8	6	1	4	0	3	0	0	0	1
	Eddy	0	2	0	1	0	0	0	0	0	2	0	1	4	1	0	2	0	1	0	0	0	0
	Total	0	14	1	6	0	0	1	2	0	2	1	13	13	12	1	8	0	8	0	0	0	3
G9	Paw Eah	10	5	0	1	0	0	2	3	1	2	8	10	8	3	0	0	4	2	0	2	1	3
	Phuch Vu	7	2	3	1	1	0	0	1	5	1	6	1	7	2	0	1	3	2	0	0	0	0
	Fan Z.	1	1	0	0	0	0	1	0	0	1	0	2	4	1	0	1	3	4	1	1	1	2
	Total	18	8	3	2	1	0	3	4	6	4	14	13	19	6	0	2	10	8	1	3	2	5
G10	Preeyanut	4	0	1	0	0	0	1	2	2	5	4	3	1	2	0	1	0	4	0	0	2	1
	Lina	1	0	0	0	0	0	0	0	1	2	6	5	6	5	0	2	5	3	0	0	0	0
	Bella	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	1	4	5	0	0	0	0
	Total	5	0	1	0	0	0	1	2	3	7	11	8	7	9	1	4	9	12	0	0	2	1
G11	Poramin	1	1	5	1	0	0	1	0	3	0	3	1	2	0	1	1	2	2	1	0	0	0
	Myo Win	4	0	4	2	0	0	0	1	4	3	5	8	3	5	0	0	3	0	0	0	2	0
	Apirak	0	2	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	3	1	0	0	0
	Total	5	3	9	3	1	0	1	1	7	3	9	10	5	5	1	2	5	5	2	0	2	0

Note. G= Group; T1= Task 1; T2= Task 2

From the analysis shown in Table 4.14, Group 1 employed varied LFs that include suggesting (9 instances), eliciting (6 instances), stating (4 instances), agreeing (3 instances), and acknowledging (2 instances), whereas questioning and elaborating were employed once each in Task 1. In Task 2, the team produced 11 instances of LFs (42.3% decreased) compared to Task 1. There were relatively similar LFs, such as stating (4 instances), requesting and suggesting (3 instances each), and eliciting (1 instance) employed by the members. Interestingly, of the 11 initiating acts produced by the team in Task 2, none received a response. The frequency counts of group members producing LFs are summarized in Figure 4.37.

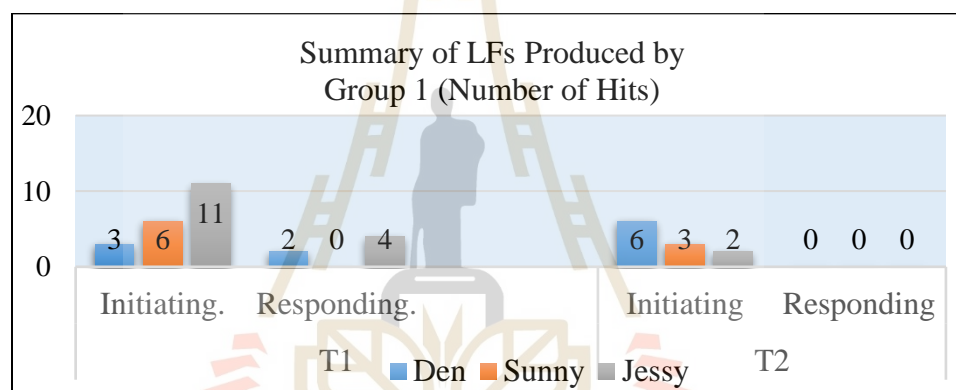


Figure 4.37 Number of LFs Produced by Members in Group 1

Group 2 produced 35 initiating acts and 16 responding acts in Task 1. The initiating acts include suggesting (14 instances), eliciting (8 instances), requesting and stating (4 instances each), greeting (3 instances), and questioning (2 instances). Whereas the responding acts include agreeing (8 instances), acknowledging (5 instances), disagreeing (2 instances), and elaborating (1 instance). In Task 2, the team employed relatively similar LFs as in Task 1, which were accounted for by 40 initiating acts and 10 responding acts. From the analysis, stating and suggesting were the most frequently used LFs in both tasks (19 instances each), followed by eliciting and agreeing (15 instances each). The frequency counts of the team producing LFs are presented in Figure 4.38.

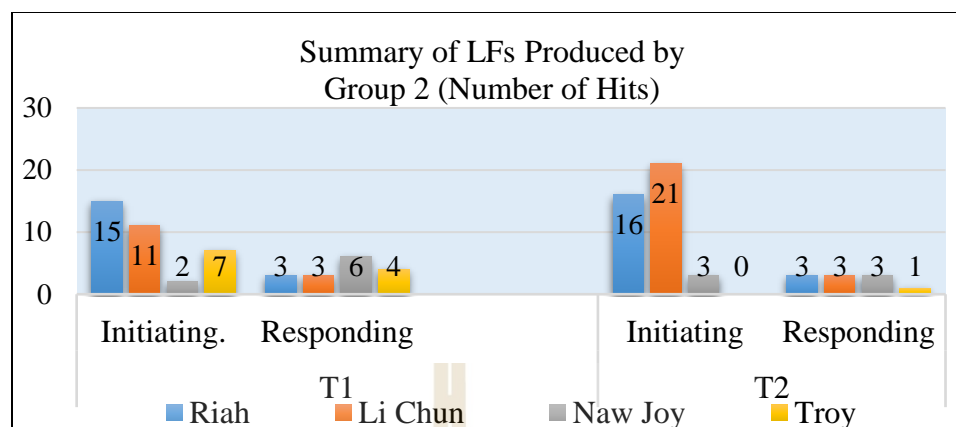


Figure 4.38 Number of LFs Produced by Members in Group 2

Group 3 produced four types of LFs in the first task consisting of suggesting (8 instances), acknowledging (7 instances), stating (4 instances), and requesting (1 instance). Of the 20 instances of LFs produced, 13 instances were initiating acts and seven instances were responding acts. In Task 2, the team produced 55 instances of LFs, which was nearly a threefold increase compared to Task 1. There were more types of LFs used in the second task, such as stating (19 instances), suggesting and agreeing (10 instances each), eliciting (5 instances), requesting and acknowledging (3 instances each), elaborating (2 instances), and greeting, justifying and questioning (1 instance each). Of the 55 instances, 40 instances were initiating acts and 15 instances were responding acts. The frequency counts of group members producing LFs are summarized in Figure 4.39.

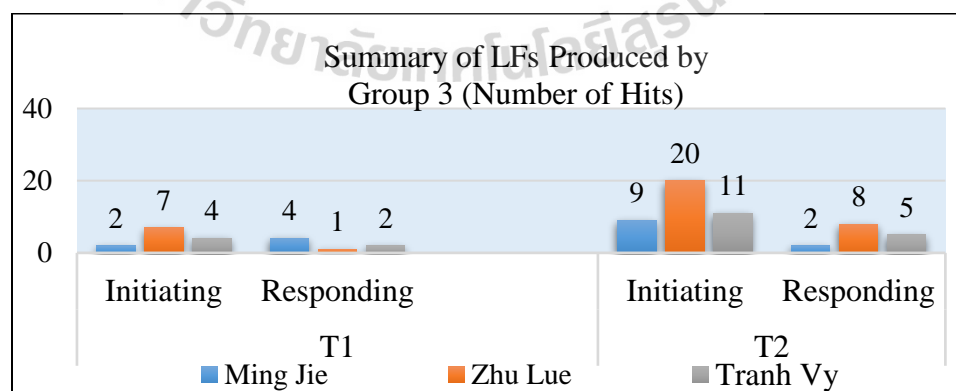


Figure 4.39 Number of LFs Produced by Members in Group 3

Group 4 employed 34 instances of LFs in Task 1 that included suggesting (11 instances), agreeing (8 instances), eliciting (7 instances), elaborating (3 instances), and greeting, requesting, and acknowledging (1 instance each). Of the 34 instances, 22 instances were initiating acts and 12 instances were responding acts. In Task 2, the group deployed 41 instances. The team used more stating (10 instances), requesting (8 instances), and greeting (4 instances) functions than in Task 1. However, the group did not use any justifying, questioning, or disagreeing in their CW task. Of the 41 instances in Task 2, 32 instances were initiating acts and nine instances were responding acts. The frequency counts of group members producing LFs are tabulated in Figure 4.40.

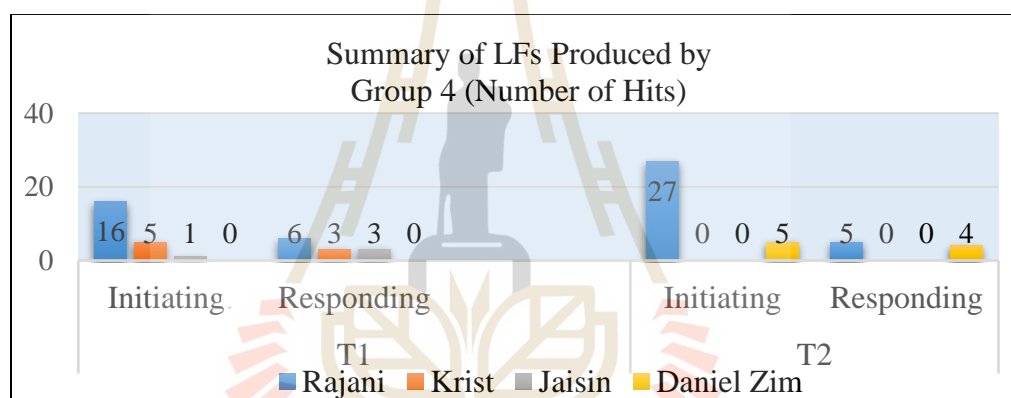


Figure 4.40 Number of LFs Produced by Members in Group 4

Group 5 used 12 initiating acts and six responding acts in Task 1. The initiating acts include suggesting (4 instances), requesting, justifying, stating, and eliciting (2 instances each), whereas the responding acts included agreeing (5 instances) and elaborating (1 instance). In Task 2, the team produced 40 instances, which accounted for 25 initiating acts and 15 responding acts. From the analysis, suggesting (13 instances), agreeing (12 instances), and stating (11 instances) were the most frequently used LFs by the team in both tasks. However, the team did not use any questioning or disagreeing act in their CW tasks. The frequency counts of group members producing LFs are shown in Figure 4.41.

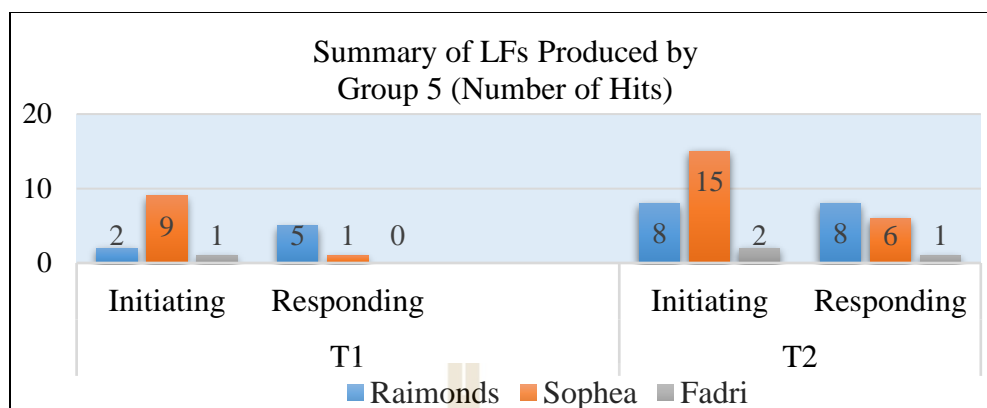


Figure 4.41 Number of LFs Produced by Members in Group 5

Group 6 deployed 13 instances of LFs in Task 1 that consisted of suggesting and stating (4 instances each), acknowledging (3 instances), eliciting and agreeing (1 instance each). Of the 13 instances, nine instances were initiating acts and four instances were responding acts. In Task 2, the team used 18 instances. Of these 18 instances, 14 of them were initiating acts and the other four instances were responding acts. From the analysis, stating was the most frequently used LF (9 instances) from the two tasks combined, followed by suggesting (5 instances), and eliciting (4 instances). The frequency counts of members producing LFs are summarized in Figure 4.42.

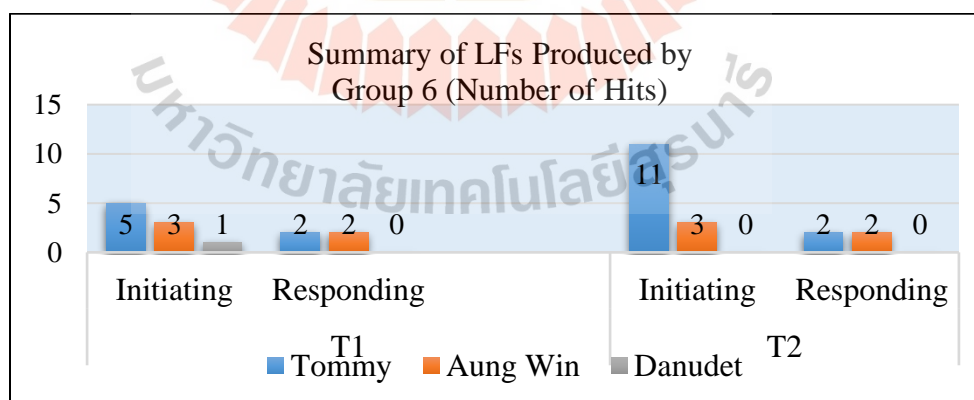


Figure 4.42 Number of LFs Produced by Members in Group 6

Group 7 employed 81 instances of LFs in Task 1. The team used varied LFs including agreeing (16 instances), greeting (12 instances), stating (11 instances), eliciting and suggesting (9 instances each), acknowledging (8 instances), requesting (7 instances), elaborating (5 instances), questioning (3 instances), and disagreeing (1 instance). Of the 81 instances produced in Task 1, 51 instances were initiating acts, and 30 instances were responding acts. In Task 2, the members employed 54 instances (33.3% reduced). The group employed similar LFs as in the first task, including stating (14 instances), requesting (11 instances), eliciting (5 instances), greeting, questioning, agreeing, and elaborating (4 instances each), suggesting and disagreeing (3 instances each), and acknowledging (2 instances). Of the 54 instances, 41 of them were initiating acts and 13 instances were responding acts. From the analysis, stating was the most used LF (25 instances) in both tasks combined, followed by agreeing (20 instances), and requesting (18 instances). The frequency counts of members generating LFs are summarized in Figure 4.43.

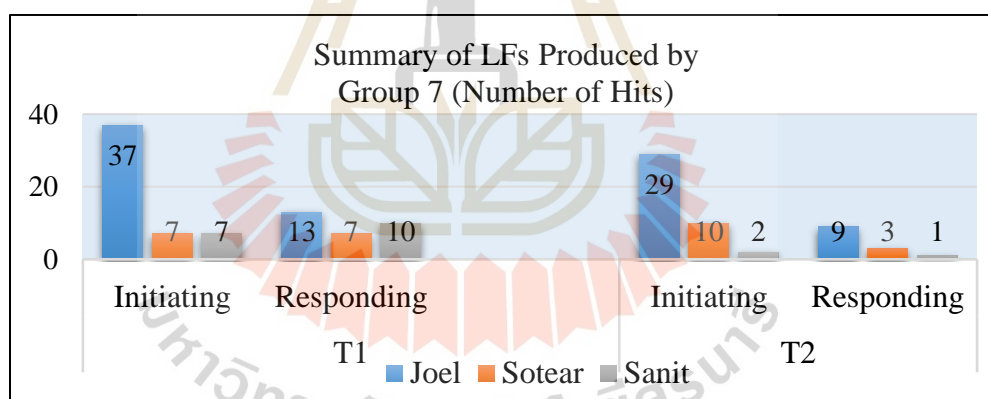


Figure 4.43 Number of LFs Produced by Members in Group 7

Group 8 generated 17 instances of LFs in Task 1. There were five different types of LFs produced in Task 1: suggesting (13 instances), greeting, questioning, stating, and acknowledging (1 instance each). Of these 17 instances, 16 of them were initiating acts and only one was responding act. In Task 2, the team produced 68 instances, which represented a fourfold increase compared to Task 1. Furthermore, there were varied types of language functions used by the team including eliciting (14 instances), stating (13

instances), suggesting (12 instances), acknowledging and agreeing (8 instances each), greeting (6 instance), elaborating (3 instances), and questioning and requesting (2 instances each). Of the 68 instances, 49 of them were initiating acts and 19 were responding acts. Suggesting was the LFs most commonly produced (25 instances) from both tasks combined, followed by eliciting and stating (14 instances each). The frequency counts of members producing LFs are presented in Figure 4.44.

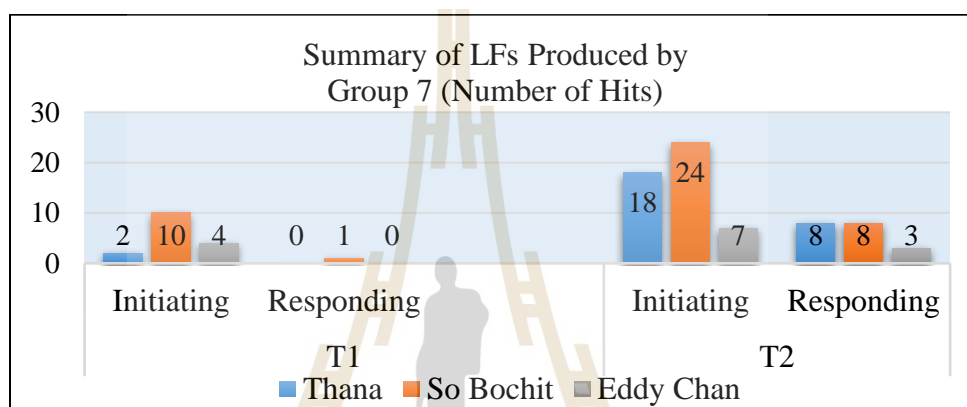


Figure 4.44 Number of LFs Produced by Members in Group 8

Group 9 produced 77 instances of LFs in Task 1: 64 instances were initiating acts and 13 instances were responding acts. The LFs employed in Task 1 included suggesting (19 instances), eliciting (18 instances), stating (14 instances), agreeing (10 instances), requesting (6 instances), greeting and questioning (3 instances each), elaborating (2 instances), justifying and disagreeing (1 instance each). In Task 2, the group employed 55 instances (37 initiating acts and 18 responding acts). The members used similar LFs as in Task 1 that covered stating (13 instances), eliciting and agreeing (8 instances each), suggesting (6 instances), elaborating (5 instances), questioning and requesting (4 instances each), disagreeing (3 instances), and greeting and acknowledging (2 instances each). Eliciting and suggesting were the most LFs frequently used (26 and 25 instances respectively). The least used LFs was justifying (1 instance). The frequency counts of members generating LFs are shown in Figure 4.45.

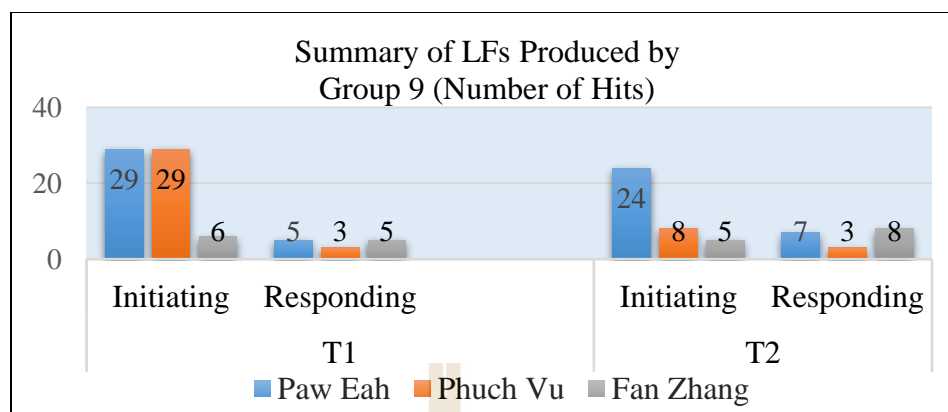


Figure 4.45 Number of LFs Produced by Members in Group 9

Group 10 performed 28 initiating acts and 12 responding acts in Task 1. The initiating acts involve stating (11 instances), suggesting (7 instances), eliciting (5 instances), requesting (3 instances), greeting and questioning (1 instance each). Whereas the responding acts included agreeing (9 instances), elaborating (2 instances), and acknowledging (1 instance). In Task 2, the group employed 43 instances, which included 26 initiating acts and 17 responding acts. From the analysis, agreeing (21 instances) was the most frequently LF used in both tasks combined, followed by stating (19 instances), and suggesting (16 instances). The frequency counts of members using LFs are tabulated in Figure 4.46.

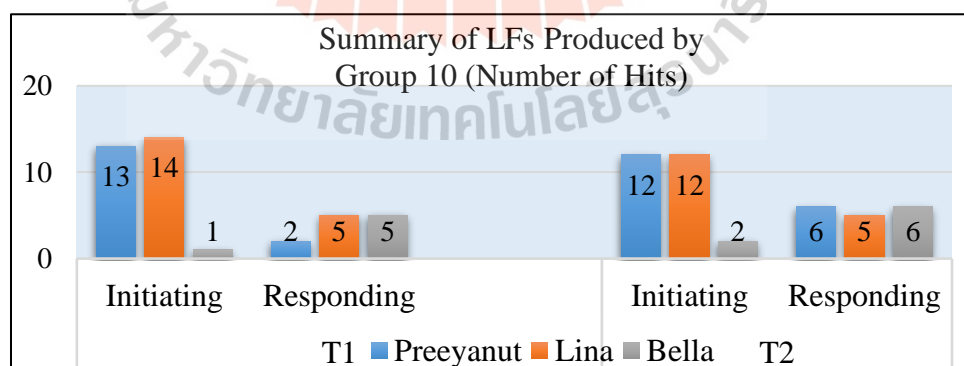


Figure 4.46 Number of LFs Produced by Members in Group 10

Group 11 employed 47 instances of LFs in Task 1. These consisted of 37 initiating acts and 10 responding acts. The LFs employed by the team covered greeting and stating (9 instances each), requesting (7 instances), agreeing and eliciting (5 instances each), disagreeing and elaborating (2 instances each), and justifying, questioning, and acknowledging (1 instance each). In Task 2, the team generated 25 instances of initiating acts and 7 responding acts. The group employed similar LFs as in Task 1, including stating (10 instances), suggesting and agreeing (5 instances each), eliciting, greeting, and requesting (3 instances each), acknowledging (2 instances), and questioning (1 instance). Stating (19 instances) was the most LFs frequently used in both tasks, followed by greeting (12 instances), and requesting, suggesting, and agreeing (10 instances each). The least used LFs was justifying (1 instance). The frequency counts of members employing LFs are summarized in Figure 4.47.

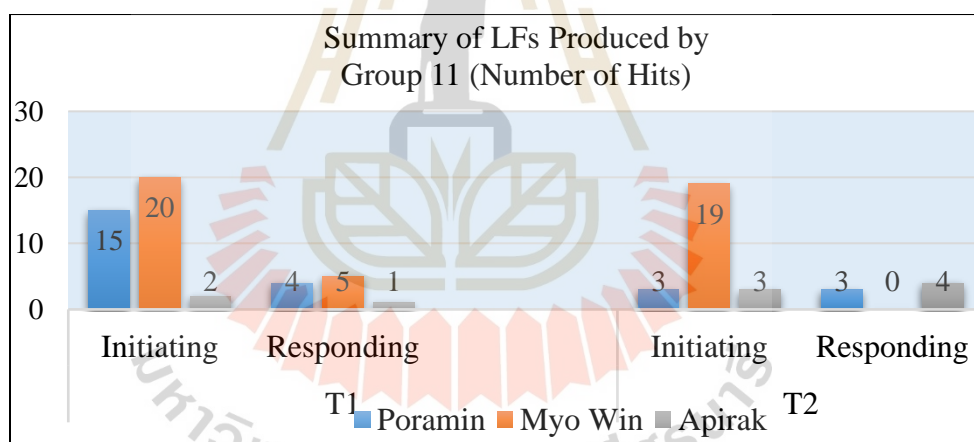


Figure 4.47 Number of LFs Produced by Members in Group 11

Considering the LFs produced by learners in small groups across tasks, the analysis showed that each group employed varied types of LFs to complete tasks. The overall percentages of LFs used by learners in small groups are presented in Figure 4.48.

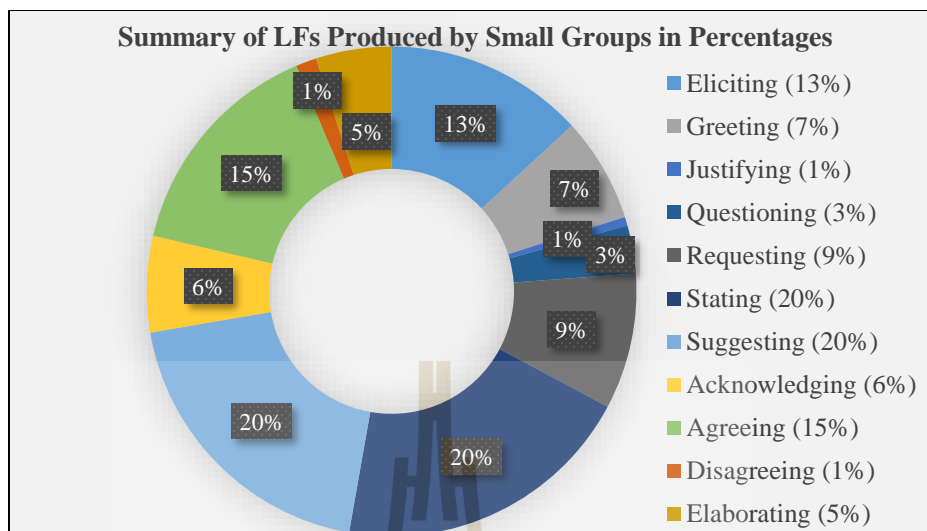


Figure 4.48 Overall Percentages of LFs Produced by Small Groups

The analysis showed that stating and suggesting (accounted for 20% each) were the two most LFs frequently employed by learners in task negotiations and interactions, followed by agreeing in responding act (15%) and eliciting (13%). Requesting accounted for nine percent and greeting seven percent of response. The least used LFs were justifying and disagreeing (1% each). Other LFs such as elaborating and questioning were used sparingly.

To further examine if there were any correlations between percentages of WCFs and LFs produced while performing CW tasks and their post-test writing, Pearson's Product Moment Correlation Coefficient (Pearson's r) was employed to analyze the data. The results of the analysis are shown in Table 4.15.

Table 4.15 Correlation between Contributions, WCFs, LFs, and Writing Performance

Variable	Descriptive Statistics			Correlation			Writing performance
	N	M	SD	Percentage of contributions	Percentage of WCFs used	Percentage of LFs used	
Percentage of contributions	35	31.45	24.56	–	.918**	.844**	.418*
Percentage of WCFs used	35	31.77	19.83		–	.860**	.421*
Percentage of LFs used	35	31.43	18.43			–	.445*
Writing performance	35	74.28	10.09				–

Note. ** Correlation significant at the .01 level (2-tailed).

* Correlation significant at the .05 level (2-tailed).

The results from the analysis indicated that there were moderately positive correlations between WCFs learners' contribution percentages to their CW tasks and their post-test writing performance ($r(33) = .421, p < .05$), and percentage of LFs used and their post-test writing performance ($r(33) = .445, p < .05$). These findings implied that learners in small groups who produced more WCFs and LFs were likely to perform better in their post-test writing. In other words, as learners increased their use of WCFs and LFs while performing CW tasks, their post-test writing scores also were improved. Other strong positive correlations shown from the analysis included learners' writing contribution and the percentage of WCFs used ($r(33) = .918, p < .01$), learners' writing contribution and percentage of LFs used ($r(33) = .844, p < .01$), and learners use of WCFs and LFs ($r(33) = .860, p < .01$). Such findings indicated that the more learners employed WCFs and LFs, the higher their contribution percentage made in group work, which resulted in a greater score in their post-test writing performance.

To investigate further if these variables (percentage of contribution, percentage of WCFs used, and percentage of LFs) can predict learners writing performance, a simple linear regression was conducted. The results of the linear regression analysis are shown in Table 4.16.

Table 4.16 Summary of Simple Linear Regression Model (N = 35)

Predictors	<i>r</i>	<i>R</i> ²	<i>R</i> ² Adjusted	<i>F</i>	<i>β</i>	SE	B
Percentage of Contributions	0.418	0.175	0.150	6.979	0.418	0.065	0.172
Percentage of WCFs used	0.421	0.177	0.152	7.113	0.421	0.080	0.214
Percentage of LFs used	0.445	0.198	0.174	8.139	0.445	0.085	0.244

A simple linear regression was calculated to predict learners writing performance based on their contributions. A significant regression equation was found ($F(1, 33) = 6.979, p < .05$) with an *R*²Adjusted value of .150. This implied that the model explained 15% of learners writing performance. Further, the model of percentage of WCFs used predicted 15.2% ($F(1,33) = 7.113, p < .05$) with an *R*² Adjusted of .152, and the percentage of LFs

used model explained 17.4% of learners writing performance ($F(1,33) = 8.139, p < .01$) with an R^2 Adjusted of .174. Aside from these predictor variables, learners writing performance scores can be explained by other factors. In the next subsection, Research Question 4 is discussed.

4.4 Answer to Research Question 4

What are the learners' perceptions of the web-based collaborative writing experiences in Google Docs?

To respond to this research question, the current researcher used the post-task questionnaire items consisting of 21 items with a five-point Likert scale to analyze quantitative data. Student reflections and semi-structured interviews were further used to analyze qualitative data to get a comprehensive understanding of learners' perceptions towards the WBCW. The findings from both quantitative and qualitative data are presented in the following.

4.4.1 Learners' Perceptions of the WBCW in GD

The quantitative data analysis of the learners' perceptions of the WBCW experience in GD are chronicled here. The results of learners' perception level after participating in two CW tasks were analyzed from the post-task questionnaire. The mean scores obtained for each questionnaire item were analyzed using descriptive statistics in terms of percentages and mean scores. The interpretation of the findings were based on the criteria previously outlined in the data analysis section of Chapter 3. The results and interpretations of the learners' satisfaction level are shown in Table 4.17.

Table 4.17 Percentage of Learners' Perception on CW Tasks in GD (N = 35)

Statement(s)	(5)	(4)	(3)	(2)	(1)	M	SD	Level of Perception
1. Google Docs is a useful tool for collaborative writing tasks.	57.1	37.1	5.8	0.0	0.0	4.51	0.61	Very High
2. I enjoyed working on Google Docs for collaborative writing tasks.	25.7	51.4	22.9	0.0	0.0	4.03	0.71	High
3. My experience with collaborative writing tasks via Google Docs is positive.	28.6	48.6	22.9	0.0	0.0	4.06	0.73	High
4. I could contribute to my group when I use Google Docs.	37.1	51.4	8.6	2.9	0.0	4.23	0.73	High
5. I used the 'History' module in Google Docs to view changes before I revised or edited the writing task.	17.1	34.3	28.6	14.3	5.7	3.43	1.12	Moderate
6. My group members and I rarely interacted in Google Docs but used other social media platforms (e.g., Facebook, Line, emails, etc.) to discuss the group task.	17.1	28.6	40.0	5.7	8.6	3.40	1.12	Moderate
7. Collaborative writing tasks in Google Docs can improve my writing skills.	28.6	60.0	11.4	0.0	0.0	4.17	0.62	High
8. I like collaborative writing tasks in Google Docs because it has a positive impact on writing quality.	31.4	45.7	20.0	2.9	0.0	4.06	0.80	High
9. Collaborative writing tasks in Google Docs help me pay attention to the use of language.	25.7	57.1	17.1	0.0	0.0	4.09	0.66	High
10. Collaborative writing tasks in Google Docs can easily develop essay content, structure, and organization.	20.0	68.6	11.4	0.0	0.0	4.09	0.56	High
11. Collaborative writing tasks in Google Docs can improve the quality of group work.	34.3	45.7	20.0	0.0	0.0	4.14	0.73	High
12. I perceived that the revision process improves the quality of writing.	31.4	57.1	8.6	2.9	0.0	4.17	0.71	High
13. Collaborative writing tasks in Google Docs promote interaction and group achievement.	37.1	48.6	14.3	0.0	0.0	4.23	0.69	High
14. Collaborative writing tasks in Google Docs promote interaction between members in the group.	42.9	42.9	8.6	2.9	2.9	4.20	0.93	High
15. Collaborative writing tasks in Google Docs promote learning-friendly environment.	25.7	54.3	14.3	2.9	2.9	3.97	0.89	High
16. My group partners valued my contributions in the collaborative writing tasks.	31.4	40.0	28.6	0.0	0.0	4.03	0.79	High
17. The members in my group interacted positively to the collaborative writing tasks.	22.9	54.3	20.0	0.0	0.0	3.97	0.75	High
18. DocuViz embedded in Google Docs raised awareness of member participation.	42.9	34.3	20.0	2.9	0.0	4.17	0.86	High
19. DocuViz embedded in Google Docs helped me monitor my contribution.	45.7	31.4	22.9	0.0	0.0	4.23	0.81	High
20. DocuViz is a useful tool to encourage group members' equal participation.	40.0	42.9	14.3	2.9	0.0	4.20	0.80	High
21. Docuviz helped monitor group members' participation to reach consensus on the final draft.	48.6	31.4	20.0	0.0	0.0	4.29	0.79	High

Based on the results presented in Table 4.17, the mean scores of learners' responses ranged from 3.40 to 4.51 that are interpreted as "moderate" and "very high" levels of perception. The findings showed that 94.2% of learners agreed and strongly agreed that GD was a useful tool for CW assignments ($M = 4.51$; $SD = 0.61$), whereas only 5.8% was not sure if the tool was useful. This indicated that the majority of participants reported having a "very high" level of perception on the item 1 statement. Over 77% enjoyed working on GD for CW tasks ($M = 4.03$; $SD = 0.71$), and they perceived that their CW experiences via GD were positive ($M = 4.06$; $SD = 0.73$), and about 23% was unsure if they enjoyed working with GD. This implied that the majority of learners reported having a high perception, in that they enjoyed CW tasks and had positive experiences working via GD (items 2 and 3). Over 88% of the participants perceived they could use GD to contribute texts ($M = 4.23$; $SD = 0.73$). However, only half of these learners (51.4%) used GD history to view changes before making a revision or editing texts, whereas one fifth of them did not use the history revision option ($M = 3.43$; $SD = 1.12$). Interestingly, 45.7% reported interacting via other social media platforms to discuss tasks. Only 14.3% agreed and strongly agreed that they interacted in GD while performing CW tasks. Nevertheless, 40% was unsure if their groups interacted with each other via GD. Overall, the issues related to perceived usefulness of GD (items 1 to 6) are summarized in Figure 4.49.

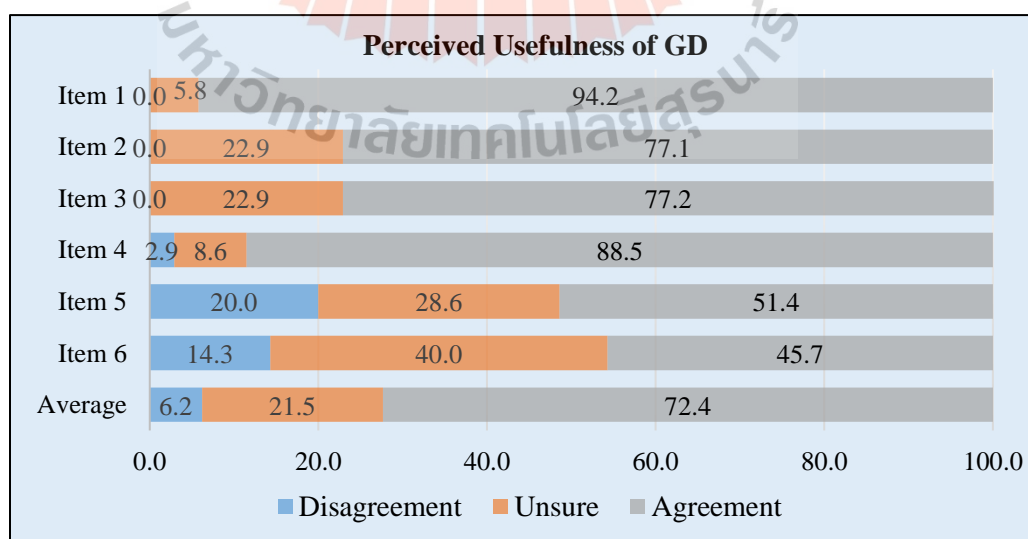


Figure 4.49 Agreement Levels on Perceived Usefulness of GD

As shown in Figure 4.49, the agreement among the six items related to perceived usefulness of GD ranged from 45.7 to 94.2%. Overall, the majority of learners (72.4%) agreed on the perceived usefulness of GD as a tool to assist collaboration, whereas less than a quarter were unsure about the usefulness of the tool for collaborative tasks.

Over 88% of the participants perceived CW tasks in GD could improve writing skills ($M = 4.17$; $SD = 0.62$), develop essay content, structure, and organization when they wrote together ($M = 4.09$; $SD = 0.56$) and also the revision process of CW could improve the quality of writing ($M = 4.17$; $SD = 0.71$) (see items 7, 10, and 12). About 77% perceived CW tasks via GD had a positive impact on writing quality ($M = 4.06$; $SD = 0.80$) (see item 8). Participants (82.8%) agreed and strongly agreed that CW tasks helped them pay attention to the use of language ($M = 4.09$; $SD = 0.66$). Learners (80%) agreed and strongly agreed that CW tasks could improve the quality of group work ($M = 4.14$; $SD = 0.73$) (item 11) as well as promoting the development of a learning-friendly environment ($M = 3.97$; $SD = 0.89$) (item 15). More than 85% of them perceived CW tasks in GD promoted interaction and group achievement ($M = 4.23$; $SD = 0.69$) (item 13), and CW promoted interaction between group members ($M = 4.20$; $SD = 0.93$) (item 14). About 71% agreed and strongly agreed that their contributions in CW tasks were valued by their teammates, whereas 28.6% was unsure if their peers appreciated their contributions (see item 16). Nonetheless, 77.2% agreed and strongly agreed that they could interact positively to the writing tasks ($M = 3.97$; $SD = 0.75$), whereas one fifth of them were unsure if their groups collaborated with each other positively (see item 17).

Overall, the statements related to perceived usefulness of CW in GD (items 7 to 17) are summarized in Figure 4.50.

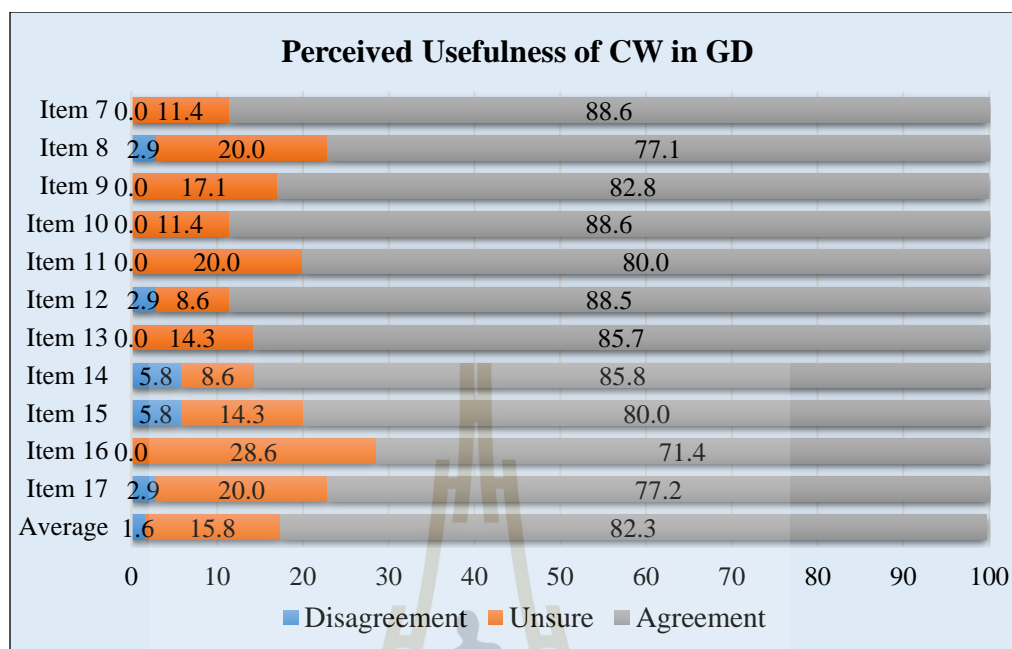


Figure 4.50 Agreement Levels on Perceived Usefulness of CW in GD

As seen in Figure 4.50, the agreement levels ranged from 71.4 to 88.6% for items 7 to 17 that related to perceived usefulness of CW in GD. Overall, most learners (82.3%) perceived CW as beneficial. In other words, the majority of learners had positive perceptions of CW in GD.

In the present study, DocuViz was deployed to monitor learners' contributions, promote accountability, and raise awareness of participation in group work. Four items related to the use of DocuViz were included in the post-task questionnaire (items 18-21). The findings revealed that over three quarters of learners (77.2%) agreed and strongly agreed that DocuViz could raise awareness of members participation in CW tasks ($M = 4.17$; $SD = 0.86$), whereas one fifth (20%) were unsure if the tool could improve member involvement (see item 18). About 77% agreed and strongly agreed that DocuViz helped monitor their contributions ($M = 4.23$; $SD = 0.81$), whereas 23% was unsure if the tool could monitor members contributions (see item 19). Participants (83%) perceived DocuViz a useful tool to encourage equal participation to perform group work ($M = 4.20$; $SD = 0.80$), while 14.3% were unsure if the tool could encourage participation (see item 20).

About 80 % agreed and strongly agreed that DocuViz could guide their group to reach consensus when they worked on the final draft ($M = 4.29$; $SD = 0.79$), whereas 20% was unsure about it (see item 21). Learners' agreement levels for perceived usefulness of DocuViz for CW are summarized in Figure 4.51.

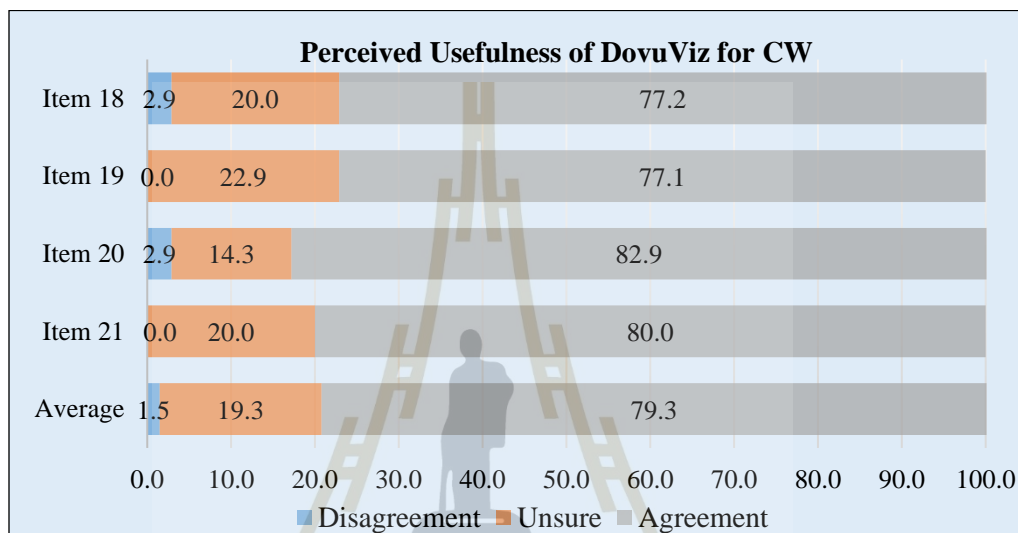


Figure 4.51 Agreement Levels on Perceived Usefulness of DocuViz for CW

As shown in Figure 4.51, the level of agreement from items 18 to 21 related to perceived usefulness of DocuViz ranged from 77.1 to 82.9%. Overall, the majority of learners (79.3%) perceived DocuViz as a beneficial tool to monitor member participation, as well as to encourage them to engage in writing. In the following subsection, further discussion is engaged in concerning the qualitative data concerning learners' perception of group work.

4.4.2 Results from Qualitative Data Concerning Learners' Perception of CW

In this section, analysis of selected qualitative data is considered, which was obtained from 35 students who completed the post-task questionnaire, open-ended questions, and reflections. The current researcher further interviewed 12 students to enrich the understanding and explanation of how learners perceived CW in GD. The researcher employed content analysis by selecting three major units for the analysis

consisting of (1) learners' perceptions on GD for CW tasks, (2) the advantages and disadvantages of CW, and (3) Learners' impression or dissatisfaction of CW tasks in GD. The researcher read and reread the transcriptions many times before started the coding to gain familiarity with the data set. The coding was carried out to reduce the massive data file into locatable categories. The subcategories with similar incidents were grouped together as main categories to generate emerging themes.

After content analysis was carried out carefully and rigorously, four themes emerged from learners' perceptions towards GD. The three positive themes identified were, (1) a convenient tool for collaboration, (2) a blended learning and communication platform, and (3) a useful tool for monitoring collaborator's engagement. One negative theme emerged, namely, an internet-based writing tool. Furthermore, the content analysis generated five emerging themes on advantages of CW consisting of (1) accelerating the work process, (2) generating a variety of ideas, (3) improving the quality of writing, (4) enhancing communication skills, and (5) learning about different cultures. Likewise, four other themes on disadvantages of group writing emerged that include (1) conflicts of ideas, (2) unequal participation of members, (3) time consumption, and (4) incoherent writing. The following subsections address themes emerged from the qualitative data analysis concerning learners' perceptions on GD.

4.4.2.1 Learners' Perceptions on GD for CW Tasks

From the qualitative content analysis concerning learners' perceptions on GD, four emerging themes were identified: a convenient tool for collaboration, a blended learning and communication platform, a useful tool for monitoring collaborator's engagement, and an internet-based writing tool. In the following section each theme is discussed briefly, which is supported by excerpts taken from interviews, student reflections, and post-task open-ended questions.

Positive Themes

a) A convenient tool for collaboration

Learners perceived GD as a cloud-based writing tool that could facilitate CW activities regardless of location. This was because during the time of data collection, 14 participants (40%) were off campus due to the COVID-19 pandemic, which prohibited them from travelling. However, through GD the teams did not need to meet in person to discuss tasks but could work simultaneously at times of convenience. Therefore, participants perceived GD to be a convenient tool and easy to use for it had similar features to a word processor. The following excerpts were extracted from the semi-structured interview and learners' reflective journals:

“Google Docs made things much quicker and more convenient. It saved our time and helped our group to work more efficiently. If we had not used Google Docs, we would have met in person which was impossible because one of our members is not on campus” (ST15- Interview)

“I believe learning through Google Docs to write our essay together is much more efficient than learning with papers as it is convenient and quick” (ST17 – Reflection)

“As an online student, I really enjoyed Google Docs and it's pretty convenient because it made our world smaller in a way. We use this tool to communicate with our group mates although we never met in person. It's amazing to me for I never used Google Docs before in high school” (ST3 – Interview)

b) A blended learning and communication platform

Furthermore, learners perceived GD as a platform to increase engagement by providing opportunities for communication both synchronously or asynchronously when members were not comfortable sharing in real-time chat rooms, but needed additional time to respond to issues being discussed. The tool enables learners' engagement and interaction in real-time or outside of class time when they feel more comfortable to leave feedback or comment on other's texts. Members can choose to work asynchronously if they need more time to reflect upon issues being discussed.

The following excerpts, extracted from the participants' reflection and post-task open-ended questionnaire items, provide examples to support the emerging theme.

“Something good about this Google Docs is we can open the file and leave the comments on each other's work, or sometime we make appointment to discuss our writing together when we don't have much time anymore before we send the final version to the teacher” (ST14 – Reflection)

“This writing platform enables our group to communicate with each other and we can edit each other's work anytime and anywhere. I'm on campus but I can interact with my teammates in Myanmar and Vietnam in real-time, and our work functions smoothly when we communicate in Google Docs” (ST21 – Reflection)

“Collaboration in Google Docs is really fascinating because we can interact and chat with each other while writing our essay. I edit my peer's work and he edits mine or we can just leave feedback in the comment box when we are not sure to edit” (ST27 – Post-Task)

c) A useful tool for monitoring collaborator's engagement

Learners perceived GD as a useful tool for tracking member engagement while performing group tasks. The cloud-based writing tool keeps a history version in that members can find all track changes and observe who was active or inactive in contributing towards group assignment as revealed in the GD archives. Each member is marked by a unique color and cursor shown on the shared document. The three following excerpts, extracted from learners' reflective journals and post-task questionnaire, supported this theme.

“Google Docs store a lot of information and record all what we wrote even when our wifi is cut. We can't fake our teacher if we helped our group or not because the teacher can track who wrote what in the history revision.” (ST2 – Reflection)

“To my surprise, our comments and the texts we wrote or even what I deleted, we can still see them if we open the history or old version in Google Docs file,

so we know who worked on each part of the essay or we can still use some texts that were deleted.” (ST7- Post-Task)

“It’s fair for me because I contributed more and the teacher could observe that from the history revision. This will inform the teacher who did more work so he can give a fair grade.” (ST25-Reflection)

Negative Theme

An internet-based writing tool

Although GD offers many benefits for online collaboration, it is viewed as an internet-based writing tool, meaning the tool functions effectively when there is a reliable Internet connection, particularly when the team works in real-time and aims to complete the task during the final stage. This is because information is autosaved to the cloud system and that requires a user to access the document through wi-fi connectivity – as its name echos, a free web-based word processor. Due to some limitations, collaborators may experience frustration when the wi-fi is disconnected. Furthermore, not all members can access to the Internet around the clock. During the time of data collection, learners who lived in rural areas reported having patchy internet connection problems when the Wi-fi network dropped out.

The four excerpts detailed below, extracted from learners’ reflective journals and interviews, supported this theme:

“A few occasions when I experienced Internet connection problem while I was revising my paragraph near the submission deadline, and I was frustrated about this. I didn’t save my paragraph in other places but only wrote in Google Docs file.” (ST8-Reflection)

“In my hometown, the connection is not stable sometimes, so it makes me worried a lot when we collaborate online because my members might think that I don’t help them as much. This can be frustrating when you don’t have a good connection to work online.” (ST13- Interview)

“A big flaw about this cloud computing software is we need a reliable wifi to do our essay to work more efficiently because if we have no internet connection, we can’t move on fast as planned.” (ST18 – Reflection)

“One bad experience about Google Docs was when our group was about to wrap up the conclusion and submitted the file, but the wifi in the dormitory was cut unexpectedly. We were worried because our work stored in Google Docs not in USB drive.” (ST21 – Interview)

4.4.2.2 Learners’ Perceived Advantages of CW

In the following section learners’ perceived advantages of CW are discussed. These responses emerged from the content analysis that included (a) accelerating the work process, (b) generating a variety of ideas, (c) improving the quality of writing, (d) enhancing communication skills, and (e) learning about different cultures.

a) Accelerating the work process

Learners perceived that effective planning in collaboration increased productivity and speeded up the workflow when workloads were distributed and executed proportionally in a timely manner. CW could help learners deepen their knowledge and enrich understanding of the subjects they were dealing with. When a member ran out of ideas, their peers could scaffold and keep the work move forward without reluctance. Collective endeavours could sharpen one’s perspective and the work could be achieved with better results. Two excerpts given below drawn from learners’ reflective journals in support of this theme:

“When working in a small group, if we cannot have ideas which our partner may figure out, they can help and get the writing proceed without stop. Then we can inspire each other to finish the work sooner.” (ST11- Reflection)

“Two or more people putting heads together are always better than one person working alone in terms of solving a problem or completing a difficult task. When we work in small groups, our work can be done faster than when we do it individually because working alone it is risky to get stuck with ideas.” (ST35- Reflection)

b) Generating a variety of ideas

Group work promotes the development of creative ideas and new perspectives. Learners perceived group writing offered them chances to improve their critical thinking and decision-making skills as they grappled with different ideas and thoughts. Team members needed to analyze, synthesize, and grasp the best ones and provide valid reasons why choosing them offered the best advantage. Through discussion, exploration of ideas, and making inquiries, members gain feedback from peers. Such learning experiences could improve cognitive abilities and intellectual skills. The following excerpts, extracted from learners' post-task questionnaire and interviews, verified this theme.

“The best way of learning with a team is because your teammates have various ideas. Several ideas can be contributed to the work so that your group work becomes more productive.” (ST4- Post-Task)

“One of the benefits of group work is your members will have many different ideas to discuss with you and the group. This can broaden your worldview.” (ST6- Post-Task)

“When we work together, we can recognize our strengths and weaknesses and by learning from other people we can improve our reasoning skills and make us wiser too.” (ST11-Interview)

c) Improving the Quality of Writing

Learners discerned that CW improved their writing skills and enabled them to achieve a deeper understanding of academic essay writing. They learned some useful vocabulary, syntax, register, writing styles, and strategies required by each type of essay from their peers who commented on their writing. In the CW process, learners communicated ideas through language use in which they shared linguistic resources and negotiated on tasks to reach a consensus. Learners produced a more logical order of ideas when they worked in small groups. Their CW tasks followed the correct format advocated for an academic essay, which made the writing more coherent and unified. The excerpts below, retrieved from learners' interviews, supported this theme.

“Group writing is fun and productive. I never did this in my country Cambodia, but it’s really astounding experience to learn how my friend from other country wrote, his English

is very advanced from the way he wrote. He commented and helped me a lot in both tasks.” (ST2-Interview)

“In the second essay we wrote, we helped each other a little more than the first one. When we supported one another, I noticed that the writing contains fewer grammatical errors because someone with better English in the group can proofread it.” (ST4-Interview)

“For me collaborative writing is much better than individual work because I can learn a lot of new phrases and vocabulary from my Filipino friend. He can show me how to correct my English. As you know my writing in English is poor.” (ST28-Interview)

d) Enhancing Communication Skills

The CW exercise was deemed to enhance communication skills as learners in small groups needed to interact and negotiate on task to achieve the group goals. Through the CW process, it is inevitable for members to engage with one another by giving feedback on work, writing constructive comments, sharing new perspectives, and responding to comments or suggestions. As collaborators learned to share ideas and responded to feedback via the cloud-based writing tool, they could hone their communication skills and learn to be more plausible when dealing with challenges related to writing issues. The three excerpts below, retrieved from learners’ reflections and interviews, verified this theme:

“Working in a small group with supportive members from different countries, we get the opportunity to build friendship and enhance our communication skills which is essential for our future.” (ST8- Reflection)

“In group work, timing is cut shorter to complete the project because it was done online, but of course we must communicate with each other in a constant basis and timely manner to meet the submission deadline.” (ST19-Interview)

“When we are engaged in group work, we need to do our part the best, and at the same time we need to learn how to communicate with our team and seek help from them.” (ST24-Reflection)

e) Learning about Different Cultures

The participants came from nine different countries in Asia. They were formed into eleven groups of three to four members. Based on the analysis from multiple data sources, including students’ reflections, post-task open-ended questions, and interviews, 19 out of 35 (54%) of the participants asserted that CW provided opportunities to learn about different cultural values, beliefs, and personalities individuals hold. Learners admitted working with peers from culturally diverse backgrounds could broaden their perspectives and creativity, and prepared them for a prospective career in the international community. Furthermore, they discerned that working with members across cultures helped them embrace the differences and became courteous and respectful to others. Learners expressed the thought that when they worked with someone from a different cultural background, they would understand the world around them better by preventing or overcoming racial division or stereotypes. When they learned to embrace cultural diversity, they could build positive relationships involving group work and develop a deeper understanding of their peers from other countries. The four following excerpts, extracted from the student reflections and interviews, asserted that these benefits were beginning to be realized:

“We have a group leader from the Philippines. He is friendly and I like his writing style. He never criticized my writing when I wrote the argument essay. He proofread my paragraph and helped my Thai friend too. I really admire his work spirit.” (ST2- Interview)

“I realized in my group our English language is not much different, but I initiated to write more when I noticed my team members from Vietnam and China did not want to start. Maybe they are not competent to lead, so I just wrote although I feel a little worried if I could lead; however, later on I received some comments from my group and they joined.” (ST7- Interview)

“Our group members are from three countries, China, Indonesia, and Myanmar. Everyone has unique personality. We have opposite views and sometimes we argue with other members. Some members are hardheaded and inflexible. This experience teaches me to stay calm and listen more, so I can continue the work without conflicts.” (ST11- Reflection)

“I think group writing help me to understand how people organize their thoughts and write essay. I try not to comment on my partner’s writing because she may not feel good about it. In my culture, which is Chinese, I tend to follow others if they can lead because I have limited knowledge in writing English essays. (ST21- Interview)

Despite the many benefits CW provided, there were some drawbacks raised by the participants. The disadvantages of CW perceived by learners are discussed in the following subsection.

4.4.2.3 Learners’ Perceived Disadvantages of CW

There were some disadvantages of CW expressed by participants. The four major disadvantages that emerged from the qualitative content analysis included (a) conflicts of ideas, (b) unequal participation of members, (c) time consumption, and (d) incoherent writing.

a) Conflicts of ideas

Conflicts are unavoidable in small groups, but they are meant to be resolved through collective efforts. Learners noted that conflicts of ideas while attempting CW tasks slowed their progression. When conflicts were not resolved immediately, members would withdraw their discussion or contribution, and held back the work. This could decrease the efficiency and productivity of group work, which hampered the quality of the final product. The following excerpts extracted from student reflections could support this theme:

“To be honest, conflicts within a group are challenging. We can contradict hundreds of reasons from interests or disagreements. If we fail to compromise, we end up in poor work and we may lose friendship, too.” (ST14-Reflection)

“In my group case, a big challenge is related to argument or conflict of each member with different ideas or thoughts. This really obstructs our work atmosphere and the member may not want to join again in discussion. Sometimes they just disappeared from the group.” (ST22-Reflection).

b) Unequal participation of members

The participants identified that CW created a discrepancy of workloads. Some members did not contribute much and rather enjoyed riding on their peer’s contributions. Such experiences occurred to the groups whose members failed to communicate or negotiate on tasks in the planning stage, or when members with low language proficiency struggled with language issues but received no support from peers. Member who possessed a dominating personality, self-reliance, and failed to scaffold demotivated their teammates to get involved in the writing task. Instead of working collectively and productively, the writing ended up with a single writer functioning or with dominant/passive style. The following excerpts, extracted from student reflections and post-task questionnaire, supported this theme.

“In collaborative writing, a major disadvantage is unequal participation when one person does nearly all the work. This becomes a burden when the essay is long, but the thing is everyone will get the same point. That’s not really fair for the one who did most of the work.” (ST1-Post-Task)

“For me, a drawback of writing together is when you do not agree with each other and someone thinks his idea is better than the others. This can spoil your writing mood.” (ST4- Reflection)

“I learn that when you work in group, there are members who just rely on their team. This behavior is nasty and not acceptable. Some only wait to enjoy the fruits of other people’s labor.” (ST16- Reflection)

“Personally, I prefer working alone because I can make a commitment. I came across some pleasant experiences when I asked my group to contribute, but they only did little on the last day before we sent our essay for grading and we had no time to revise or edit it. This gave me a bad experience of group work.” (ST25- Reflection)

c) Time consumption

Learners expressed that CW in small groups was time-consuming, as they needed to plan together at the early stage prior to distributing a workload to each member. The first round of planning might fail, so more group meetings are needed to coordinate with all members' schedule and convenience. On some occasions, members did not respond to an urgent request due to scheduling conflicts or on account of being engaging with other projects, or they were offline. This could halt the work process and further put pressure on the team. Thus, executing a successful CW task with high-profile quality requires constant endeavors, planning, active participation, and commitment from individual members. The three excerpts below, taken from student reflections and post-task questionnaire, addressed this theme:

“Different members have different views, so that when we make an agreement or decision, it takes a long time than what we expected.” (ST8-Reflection)

“Everyone has their own different beliefs and experiences, and as a result making everyone in a group to discuss and reach mutual agreement is really painstaking and long-delayed work we need to bear with.” (ST13-Reflection)

“When we write in group, we need to wait for other's section to be added in, and we ensure our paper is error-free. To complete a group essay together with someone who makes many errors here and there, you need to spend a lot of time editing the texts. Honestly speaking, I rather enjoy working alone.” (ST25-Post-Task)

d) Incoherent writing

Learners noted that during a CW experience writing inconsistencies could develop and a lack of coherence could emerge, especially when members procrastinated and failed to negotiate on tasks. When segregated paragraphs constructed by three or four authors needed to be merged into a unified essay, the member must ensure the writing organization flows smoothly. Coordinating conjunctions and transitional words must be properly employed to connect each paragraph. Checks need to be performed to ensure the logical flow of ideas, and then there is the task of proofreading

and editing texts. The group must ensure their co-constructed essay is cohesive and unified. Three excerpts below, extracted from student reflections and post-task questionnaire, verified the existence of these challenges:

“Group writing is truly beyond my imagination. Writing should be individual because you can organize your idea comfortably without consulting others. But to write an essay together I’m doubted if many people’s ideas can be connected, unless someone proofreads and edits the work thoroughly.” (ST9-Reflection)

“For me, writing alone is more preferable because I know what I am doing. If you write with someone and put your work together, you must edit it carefully. If you don’t do this, your writing will look weird since ideas are from many writers.” (ST24-Post-Task)

“When the members don’t start earlier and wait until the end before the deadline, they will rush to finish their parts. When we combine the paragraphs, they look more like blocks and the essay lacks good structure and unity if we don’t correct it in time.” (ST32-Reflection)

In short, the results of qualitative data analysis pertaining to learners’ perceptions of CW in GD contained both advantages and disadvantages. The key elements that caused negative experiences among learners included conflicts of ideas, unequal participation of members, time consumption, and incoherent writing due to nonproductive member participation or recklessness. Such drawbacks experienced during group work can be minimized by (a) assigning a clear role and responsibility to individual members at the planning stage; (b) devoting personal time and efforts to communicate constantly with each other; (c) embracing the differences and abilities individual members have; (d) appointing a trustworthy and supportive leader; (e) resolving conflicts with an open-minded approach; (f) scaffolding members who struggle with language skills; and (g) learning to adopt the practice of mutual concessions – to give and to take.

To sum up, in this chapter the results of the study were discussed based on the research questions. First, the findings of Research Question 1 were presented.

It began with the presentation of the results of participants overall writing performance in the pre- and post-tests. Then it presented domain-specific of learners' writing improvements, including general textual features. Second, the results of Research Question 2 were discussed concerning the patterns of interactions and CW styles, which were analyzed through the GD archives and DocuViz. The presentation of the findings included a summary of the small group's interaction patterns and CW styles across tasks, the learners' proportion of contributions, and the correlation observed between learners' contributions and their writing performance. Third, the findings of Research Question 3, were addressed regarding the WCFs and LFs employed by learners working in small groups. The discussion included a summary of WCFs and LFs individual members employed across tasks, the overall percentages of WCFs and LFs used by small groups, and the relationships between learners' WCFs contributions and the LFs produced, and their post-test writing scores. Lastly, results were presented relevant to Research Question 4, which dealt with learners' perceptions of WBCW in GD. The presentation included the quantitative data interpreting learners' perception levels based on a five-point Likert scale. The results were discussed further utilizing a qualitative content analysis approach concerning learners' perception of CW. It ended with the summary of the chapter.

CHAPTER 5

SELECTED CASES: ANALYSIS ON PATTERNS OF INTERACTION

This chapter further explored patterns of interaction exhibited by three groups (cases) engaging in two tasks. The researcher selected the cases based on the criteria that include (1) maximum variations in terms of distinctive CW styles and interaction patterns, (2) the team consisted of members from different cultural backgrounds with varied in English proficiency levels, and (3) at least two members were off-campus during the time of data collection due to the COVID-19 pandemic situation. The three selected groups for this case study were Groups 1, 7, and 8. This would explain how learners of these small groups negotiated, interacted, and scaffolded their peers while jointly constructed texts via GD. The chapter started with a holistic view of varied patterns of interaction the three cases performed across tasks. Then the major findings concerning the distinctive patterns of interaction were discussed by exploring their engagement with others' text contributions through their use of WCFs and LFs. The chapter ended with summary of interaction patterns of the selected cases and learners' deployment of their linguistic repertoire.

5.1 An Overview of Selected Case Interaction Patterns

To fathom the phenomena being investigated of learners in small groups interacting with one another, their inputs and shared information were triangulated from various data sources, including text contributions, discussion and comments retrieved from GD archives, and reflective journals. Overall, seven distinctive patterns of interaction were identified from the analysis as outlined in Chapter 4. However, the three groups selected for case study demonstrated five of those seven patterns across tasks. The five patterns of interaction include active and withdrawn (Group 8), collaborative (Group 1), cooperating in parallel (Group 8), dominant and defensive (Group 1), and expert and novice (Group 7). Each group interaction patterns are presented in the following.

Group 1: Collaborative (Task 1) --- Dominant and Defensive (Task 2)

Group 1 consisted of three males from India (Sunny), Malaysia (Den), and the Philippines (Jessy). In Task 1, the team collaborated well to complete their descriptive essay on topic “the university landmarks”. The group exhibited equal participation in text contributions (reflected by their use of WCFs and percentage of contribution) and mutual engagement in text construction (reflected by their use of LFs). The members scaffolded each other while co-constructing their essay. However, in Task 2, the group interaction pattern shifted to a “dominant and defensive” pattern when the team constructed their argumentative essay. The members failed to interact with each other. To understand the occurrence of members’ interaction across both tasks, the percentages of text contribution, frequently used of WCFs, and LFs are summarized in Table 5.1

Table 5.1 Text Contributions, WCFs, and LFs Produced by Group 1

Group 1	Percentages of contribution (%)		WCFs (frequency counts)				LFs (frequency counts)			
	T1	T2	T1		T2		T1		T2	
			Self	Other	Self	Other	Ini.	Res.	Ini.	Res.
Den	34	10	14	10	1	5	3	2	6	0
Sunny	33	46	10	2	4	0	6	0	3	0
Jessy	33	44	15	2	3	1	11	4	2	0
<i>Total</i>	100	100	39	14	8	6	20	6	11	0

* Ini. = Initiating acts; Res. = Responding acts

As seen (Table 5.1), the team contributed equal texts in Task 1. The members employed 53 instances of WCFs and 26 acts of LFs. About 26.4% of WCFs were made on other-text. Likewise, the members produced 26 acts of LFs in Task 1 (20 initiating acts with 6 responding acts). This implied that the members showed some interactions with each other’s texts. In Task 2, the percentages of text contribution were unbalanced. The essay was mostly produced by Sunny and Jessy, while Den made little contribution. Furthermore, the team employed very limited WCFs and LFs to interact with one another. Surprisingly, the initiating acts of LFs received no response. This indicated the lack of

mutual engagement among members. Examples of WCFs and LFs produced by Group 1 are illustrated in Figures 5.1, 5.2, 5.3, and 5.4.

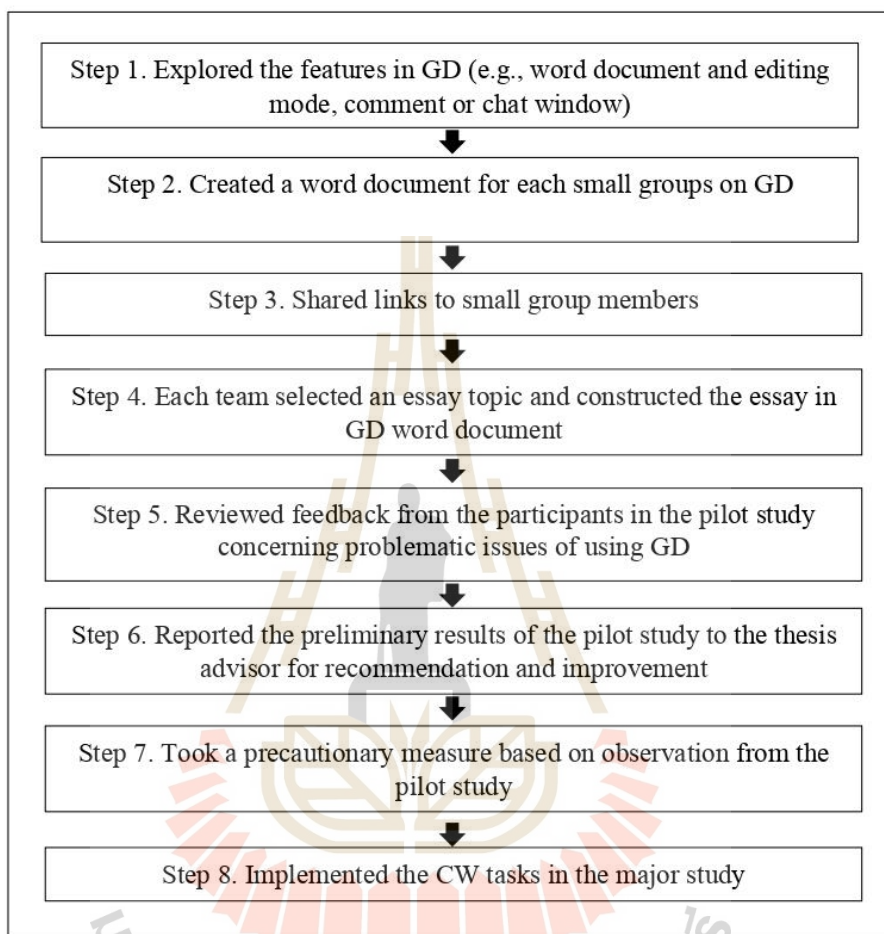


Figure 5.1 Example of WCFs Performed by Group 1 in Task 1

Group 1 produced 53 WCFs: 39 instances are on self-text and 14 instances on other-text. Den used the most WCF (45.3%), followed by Jessy (32.1%), and Sunny employed the least WCFs (22.6%). From GD archive, the team planned the essay outline together. Sunny worked on the introduction and body paragraph 1 (describing the Thai Sala), whereas Jessy was responsible for the second body paragraph (portraying the beauty of the university church). Den was in charge of the last body paragraph (describing the university monument). Sunny made a brief conclusion. The team interacted with each other's text. For example, in the excerpt (Figure 5.1) when Sunny started the outline, Jessy

added texts. Den corrected Sunny's text from "Salas are usually found close to buddhist temples" to "Closed to the Buddhist temples is where you can find Salas." Den was active in correcting his peers' texts. Further evidence of peer interaction is seen through their use of LFs. Figure 5.2 demonstrates some examples of members employing LFs in CW Task 1.

CW Task 1 (Descriptive Essay)	
<ul style="list-style-type: none"> ▪ Den: 5; Sunny: 6; Jessy: 15 ▪ 20 initiating ; 6 responding 	
<p><u>Examples</u> Jessy: How about the university landmarks? We can talk a lot about them. They are good choice! <i>(Eliciting, Suggesting)</i> Den: Great title on AIU landmarks.<i>(Acknowledging)</i></p> <p>Jessy: Are we sure we can talk much about this university monument with much detailed information? <i>(Eliciting, No response)</i></p> <p>Den: We can omit this word "people" and start the sentence with "Three major landmarks..." <i>(Suggesting)</i> Jessy: That's great! <i>(Acknowledging)</i> Sunny: I think we should write about the Thai Sala instead of Hope Channel Asia Building. <i>(Suggesting)</i> Jessy: I think so too. We can talk more about it in my opinion. <i>(Agreeing, Stating)</i></p> <p>Den: The number of flags and the actual number of countries represented in the campus do not actually match. I guess the new flags have yet to be added. <i>(Elaborating, Suggesting)</i></p>	<p><u>Examples</u> Sunny: Should we specify how many countries? <i>(Questioning)</i> Jessy: What about adding the name of the province "Saraburi" Thailand? <i>(Eliciting, No response)</i></p> <p>Sunny: The name of the university should be capitalized as AIU instead of Aiu. <i>(Suggesting, No response)</i></p> <p>Sunny: I think AIU church is more important than the auditorium to describe. <i>(Suggesting)</i> Jessy: I'm okay with you. <i>(Agreeing)</i> Jessy: I added "bougainvillea trees and palm trees" in the body paragraph that describes AIU church. <i>(Stating, No response)</i></p> <p>Jessy: Should we add transitional words like "First" or "Second" and "Lastly" in each new paragraph? <i>(Suggesting, No response)</i></p>

Figure 5.2 Example of LFs Performed by Group 1 in Task 1

The group employed 26 LFs: 20 initiating acts and 6 responding acts. Jessy produced the most LFs (57.7%), whereas Sunny contributed 23.1% and Den 19.2% respectively. The analysis showed that 30% of the initiating acts produced by the team received responses. Some LFs employed by the group are illustrated in Figure 5.2. For example, when the group brainstormed for a topic, Jessy suggested describing the university landmarks. Den acknowledged it and developed the topic together. Another example was when Den listed "Hope Channel Asia Building" in the outline; Sunny suggested describing "Thai Sala" as it symbolizes Thai culture that would give a better impression on the university landmark.

Jessy acknowledged Sunny's idea. In short, the team showed equality (reflected by percentage of members' text contributions). This ascertained some mutual engagement among the team, as marked by their use of LFs.

In Task 2, the team shifted their interaction pattern to a "dominant and defensive" when Sunny and Jessy controlled the essay entitled, "the Paris Agreement", and paid no attention to Den's comments. Den, on the other hand, made little contribution (10%). Their use of WCFs and LFs were reduced drastically. Surprisingly, all LFs produced, such as stating, suggesting, or requesting, received no responses. Furthermore, the group procrastinated the writing and started their work only three days before the submission deadline. Some examples of WCFs employed by Group 1 in Task 2 are shown in Figure 5.3.

CW Task 2 (Argumentative Essay)

▪ Den: 6; Sunny:4; Jessy: 4
▪ 8 Self vs 6 Other

<u>Examples</u>	<u>Examples</u>
<p>Sunny wrote: While some worry about the job loss, other are at ease with the amount of new ones that will be available.</p> <p>Jessy deleted: While some worry about the job loss, other are at ease with the amount of new ones that will be available. <i>(deleting, other)</i></p> <p>Jessy: Although the Paris Agreement pledged to bring lower temperature change, it never specified how. Since 2016, when the agreement was signed, the global carbon emissions have risen by approximately 4% (medium.com)</p> <p><i>More specifically, coal emissions have gone up by 1%, and gas by 3%. The three main reasons aren't effective are: the goals are not strong enough, the agreement does not include any financial incentives, and there is no punishment for dishonoring the agreement. (adding, self)</i></p>	<p>Sunny wrote: All these would result in a loss of \$3 trillion as well as 6.5 million jobs lost by 2040 (Whitehouse.gov.) However, there are counter argument. Den corrected: All these would result in a loss of \$3 trillion....However, there are counter-arguments raised by others. <i>(correcting, other)</i></p> <p>Jessy wrote: However, people say that different impositions are actually fair. Den deleted: However, people say that different impositions are actually fair. <i>(deleting, other)</i></p> <p>Jessy wrote: But the bottom line is that the Paris Agreement accord is very unfair at the highest level to the United States. There are many other examples. Den reordered the sentences: There are many other examples. But the bottom line is that the Paris Agreement accord is very unfair at..... <i>(reordering, other)</i></p>

Figure 5.3 Example of WCFs Performed by Group 1 in Task 2

As seen from the excerpt (Figure 5.3), Jessy deleted Sunny's text without further explanation, or when Den reordered Jessy's text from "But the bottom line is that.... There are many other examples." to "There are many other examples. But the bottom line is that...." without leaving him a comment. In GD archive, Jessy rejected this statement and rephrased it as it was initially stated. He did not take Den's correction. Further evidence was marked by their ignorance of responding to comments. Some examples of LFs used by the team in Task 2 are demonstrated in Figure 5.4.

CW Task 2 (Argumentative Essay)	
<ul style="list-style-type: none"> ▪ Den: 6; Sunny: 3; Jessy: 2 ▪ 11 initiating ; 0 responding 	
<p><u>Examples</u> Jessy: Some spelling errors and grammatical errors on here. <i>(Stating, No response)</i></p> <p>Jessy: Shouldn't we put the author's name and year of publication for citation right? <i>(Eliciting, No response)</i></p> <p>Den: Please remove one unnecessary "has" on this sentence. <i>(Requesting, No response)</i></p> <p>Den: It seems that the use of article here may be incorrect. <i>(Stating, No response)</i></p> <p>Den: It appears that counter argument is missing a hyphen in this sentence. <i>(Stating, No response)</i></p>	<p><u>Examples</u> Den: The word "really" in the sentence here is unnecessary. <i>(Stating, No response)</i></p> <p>Sunny: Maybe the term "the bottom line" can be replaced by a more formal phrase. <i>(Suggesting, No response)</i></p> <p>Den: I think the word "actually" in this sentence is unnecessary, you may want to consider removing it. <i>(Suggesting, No response)</i></p> <p>Sunny: Maybe this can be expanded a little bit more instead of just say "All aspects should be taken into account" and end there. <i>(Suggesting, No response)</i></p>

Figure 5.4 Example of LFs Performed by Group 1 in Task 2

The members failed to respond to each other's comments as shown in the excerpt when Jessy stated there were some typos and grammatical errors Sunny wrote, but received no response from Sunny, or when he elicited on Sunny's text to add the author's name and year of publication, but Sunny failed to respond. Likewise, Den made comments on Sunny's texts such as an incorrect use of article or missing of hyphen on word "counterargument". Sunny did not reply, and in the final draft, the texts remained

unchanged. The interaction pattern was viewed as dominant and defensive since the members was unwilling to engage with peers' comments. Furthermore, they made no change on those texts in the final version. The next subsection explained patterns of interaction exhibited by Group 7.

Group 7: Expert/Novice (Task 1) --- Expert/Novice (Task 2)

Group 7 was comprised of one female from Cambodia (Sotear) and two male students from the Philippines (Joel), and Thailand (Sanit). In the first task, the group jointly constructed a descriptive essay, "The Beauty of Southeast Asian Countries". The members showed active participation in completing the task. Joel led the team and scaffolded his peers concerning language issues. This was observed through their use of WCFs and percentage of text contribution. The team showed mutual engagement in text construction (reflected by their use of LFs). Joel served as an expert who assisted the teammates (novice) with language issues. In Task 2, the group interaction pattern remained stable when the team constructed their argumentative essay, "College Education and Being Successful". Joel proposed a topic and directed the team. To perceive the incident of how the team negotiated, interacted, or communicated across tasks, the percentages of members' text contributions, frequently used of WCFs, and LFs are tabulated in Table 5.2.

Table 5.2 Text Contributions, WCFs, and LFs Produced by Group 7

Group 7	Percentages of contribution (%)		WCFs (frequency counts)				LFs (frequency counts)			
	T1	T2	T1		T2		T1		T2	
			S	O	S	O	Ini.	Res.	Ini.	Res.
Joel	73	73	50	32	41	22	37	13	29	9
Sotear	14	15	27	2	18	2	7	7	10	3
Sanit	13	12	34	4	16	0	7	10	2	1
<i>Total</i>	100	100	111	38	75	24	51	30	41	13

* Ini. = Initiating acts; Res. = Responding acts

As seen (Table 5.2), Joel made the most contribution in both tasks (73% each); however, the GD history revision revealed that members interacted positively with each

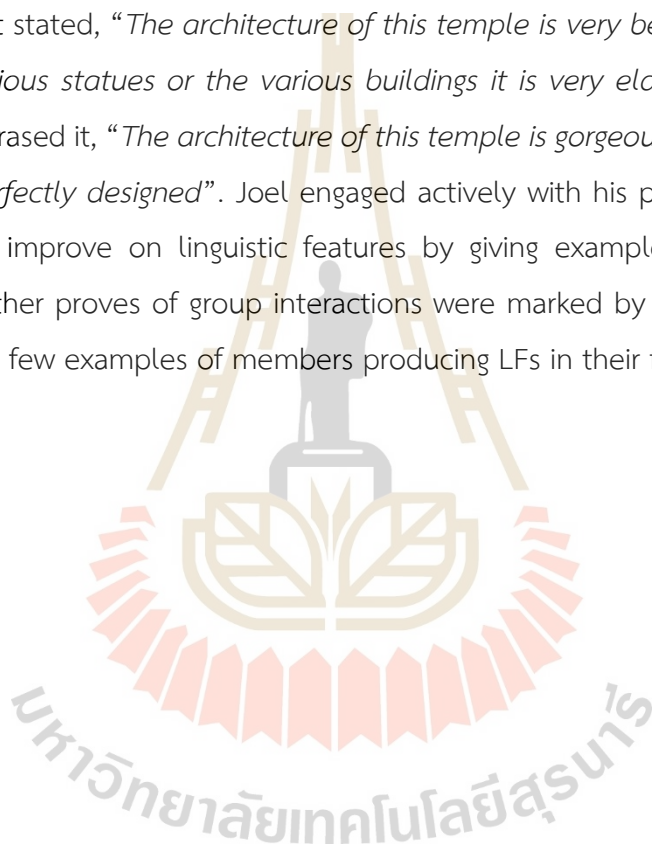
other's texts. Joel proofread texts and suggested his peers to revise their sentences by giving examples of correct expressions/phrases. This scenario indicated Joel scaffolding his teammates in constructing their essay. Noticeably, Joel employed the most WCFs and LFs across tasks, and he involved actively with Sotear and Sanit's texts. As shown in Table 5.2, both Sotear and Sanit produced likely equal amount of WCFs and LFs, but the WCFs used by the dual members were more on self-text. Examples of WCFs and LFs produced by the group are presented in Figures 5.5, 5.6, 5.7, and 5.8.

CW Task 1 (Descriptive Essay)	
■ Joel: 82; Sotear: 29 ; Sanit: 38 ■ 111 Self vs 38 Other	
<p><u>Examples</u></p> <p>Sotear: The Angkor Wat is most visited twice a year when the morning bright sun rises which makes it look more spectacular.</p> <p>Joel corrected: The Angkor Wat is most visited <i>twice a year when the bright morning sun rises which brightens the temple with splendid light.</i> (correcting, other)</p> <p>Sotear wrote: The structure of the wall represents many characters that tell us every detail from Angkor time. Therefore, all of this beautiful design can get a lot of interest from other countries.</p> <p>Joel added: The structure of the wall represents many <i>characters... Angkorian architecture is the architecture produced by the Khmers during the Angkor period and their materials such as bricks, sandstone, laterite, and strong wood. Therefore, all of this beautiful design</i> (adding, other)</p>	<p><u>Examples</u></p> <p>Sanit: Thailand is famous for architecture and carvings from the past to present.</p> <p>Sanit corrected: Thailand is famous for <i>its</i> architecture and carving <i>throughout centuries.</i> (correcting, self)</p> <p>Sanit wrote: The architecture of this temple is very beautiful and grand, and carvings of various statues or the various buildings it is very elaborate and exquisite that is almost flawless.</p> <p>Joel rephrased: <i>The architecture of this temple is gorgeous, and also the carvings and statues are perfectly designed.</i> (rephrasing, other)</p> <p>Sanit wrote: Therefore, I would like to devote myself to Buddhism. And the last is King: He loves and appreciate the divine grace of the king (Rama IX), thus creating for him.</p> <p>Joel rephrased: <i>Therefore he devoted himself to Buddhism ; King, as his love passed through the late king (Rama IX), therefore he built this temple for the king to show his appreciation.</i> (rephrasing, other)</p>

Figure 5.5 Example of WCFs Performed by Group 7 in Task 1

Group 7 generated 149 WCFs, in which 111 instances are on self and 38 instances on other. Joel produced the most WCFs (55.1%), followed by Sanit (25.5%), and Sotear (19.4%). From GD archive, Joel started a conversation and proposed a topic. He divided workloads to his teammates. Joel wrote the introduction, the last body paragraph describing beautiful beaches of the Philippines, and concluded the essay. Sotear

contributed the first body paragraphs depicting the beauty of Angkor Wat, and Sanit worked on the second body paragraph describing Wat Rong Kun Temple in Thailand. Throughout the CW process, Joel assisted his partners with language related issues. For example, in the excerpt (Figure 5.5) when Sotear wrote, “...when the morning bright sun rises which makes it look more spectacular.” Joel corrected the phrase, “...when the bright morning sun rises which brightens the temple with splendid light”. Another example was when Sanit stated, “The architecture of this temple is very beautiful and grand, and carvings of various statues or the various buildings it is very elaborate and exquisite”. Then Joel rephrased it, “The architecture of this temple is gorgeous, and the carvings and statues are perfectly designed”. Joel engaged actively with his peers’ work and offered suggestions to improve on linguistic features by giving examples of correct forms of sentences. Further proves of group interactions were marked by their use of LFs. Figure 5.6 illustrates a few examples of members producing LFs in their first task.



CW Task 1 (Descriptive Essay)

- Joel: 50 ; Sotear: 14 ; Sanit: 17
- 51 initiating; 30 responding

<p><i>Examples</i></p> <p>Joel: Hi guys! You can call me Vin. I think it's better to talk here in this platform so the teacher would know progress. Nice to get to know you all.</p> <p>Sotear: Hi! You may call me Nich. Nice to meet you all.</p> <p>Sanit: I'm C. Nice to meet you too.</p> <p>(Greeting, Suggesting, Greeting, Greeting)</p> <p>Joel: Hey guys! Anyone kindly give a suggestion on a topic we should do and feel free to suggest!</p> <p>Sanit: I haven't thought about it yet.</p> <p>Joel: I have thought of an idea that maybe we can describe our favorite place in our countries since we are all from 3 different countries.</p> <p>Sanit: I agree with that.</p> <p>(Greeting, Requesting, Stating, Suggesting, Agreeing)</p> <p>Sotear: So what is our topic, we need to have three body paragraphs right?</p> <p>Joel: Yes. 3 body paragraphs. One for you, for C, and for me. I'll introduce it nicely in the introduction part so don't worry. You can help me revise it later. By the way, our topic is a favorite place in our countries.</p> <p>Sotear: Okay.</p> <p>(Questioning, Agreeing, Elaborating, Stating, Agreeing)</p>	<p><i>Examples</i></p> <p>Joel: Hello! I think it is important to cite source (if there are any) on how this place dubbed as the most beautiful temple in Thailand. With this, our essay will be more perfect.</p> <p>Sanit: Yes, I'll do that.</p> <p>(Greeting, Suggesting, Agreeing)</p> <p>Sotear: Should we add a little more information on the conclusion?</p> <p>Joel: We can take a look at it later when all body paragraphs are done.</p> <p>(Questioning, Suggesting)</p> <p>Sotear: I think we should add up these two concepts and make it a conclusion.</p> <p>(Suggesting, No response)</p> <p>Sanit: Please help check this sentence if it sounds right.</p> <p>Joel: Sure, I'll take a look at it later.</p> <p>(Requesting, Agreeing)</p> <p>Joel: Please check your grammatical error on comma splices and run on, C.</p> <p>Sanit: Okay</p> <p>(Suggesting, Agreeing)</p> <p>Sanit: You wrote and explained our conclusion so well.</p> <p>Joel: Thank you! You did well on your part too.</p> <p>Sotear: Yes, I agree with the conclusion. You did a wonderful job!</p> <p>(Acknowledging, Acknowledging, Agreeing, Acknowledging)</p>
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Figure 5.6 Example of LFs Performed by Group 7 in Task 1

The team produced 81 acts of LFs, accounted for 51 initiating acts and 30 responding acts. Joel used the *most* LFs (61.7%). From the varied uses of LFs, it indicated that the team showed mutual engagement with members' texts. The members greeted each other to establish a rapport as they were new to each other. As seen from the excerpt (Figure 5.6), Joel negotiated a topic suggesting the members to choose a favorite place in their own countries to describe. Sanit and Sotear agreed with the idea. An example of mutual engagement on member's text was identified when Joel suggested Sanit to get a source to support the claim why the place is considered the most beautiful temple in the country "...it is important to cite source (if there are any) on how this place dubbed as the most beautiful temple in Thailand". Another illustration of mutual interaction was when Sanit

requested Joel to assist him with grammar, “Please help check this sentence if it sounds right”, and Joel agreed with his request. Both Sanit and Sotear acknowledged Joel’s writing ability when he concluded the essay. In Task 2, the group interaction pattern remained unchanged when the team worked on their essay. Similar to Task 1, Joel invited his partners to brainstorm for a topic. Once the team agreed on a topic, Joel divided the workload by requesting Sanit to work on the introduction and the second paragraph, Sotear took the first body paragraph, and Joel was in charge of the third body paragraph and the conclusion. Examples of WCFs exhibited by the team are displayed in Figure 5.7.

CW Task 2 (Argumentative Essay)

▪ Joel: 63; Sotear: 20 ; Sanit: 16
▪ 75 Self vs 24 Other

<p><u>Examples</u></p> <p>Joel: Having a college degree is the first step to pursuing further career in a specific field like being a doctor or an astronaut. College is a huge factor and not to mention the costs that go along with it.</p> <p>Joel reordered the sentences: College is a huge factor and not to mention the costs that go along with it. <i>However, having a college degree is the first step to pursuing further career in a specific field like being a doctor or an astronaut.</i> (reordering, self)</p> <p>Sanit: However, whether you choose a college education or choose to find your talents and follow them, nothing can guarantee you success in life. <i>Therefore, if you get a higher college education does not guarantee you get a job the right way, some successful people do have a college degree.</i> (adding, self)</p> <p>Sanit wrote: How Necessary is a College Education?</p> <p>Joel rephrased: College Education and Being Successful (rephrasing, other)</p>	<p><u>Examples</u></p> <p>Sotear: Having a practical experience in their respective fields can be a much greater help since most institutions require their aspiring inspiring employees to have a year of experience or two. (correcting, self)</p> <p>Sanit: Mark Zuckerberg, owner of Facebook. According to the information from the Biography website said that he did not graduate from college.</p> <p>Joel rephrased: Mark Zukerberg, Facebook's Chief Executive Officer and Founder, is a Harvard University drop out who was able to make fortunes after deciding to make a path for himself outside college. (rephrasing and adding, other)</p> <p>Sanit: There are various reasons why having a college degree is not essential to being successful and not the only thing to have for being one.</p> <p>Joel added: There are various reasons why having ... for being one, <i>such as not all college graduates are are guaranteed immediate jobs, a lot of successful people do not have a college degree, and not all students have solid future career paths.</i> (adding, other)</p>
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Figure 5.7 Example of WCFs Performed by Group 7 in Task 2

The team generated 99 WCFs in Task 2: 75 instances on self-text and 24 instances on other-text. Of the 99 instances, Joel produced 63.6% of them. From GD history revision, Joel directed the group and improved his partners’ work by adding, rephrasing, or correcting grammar and editing language. For example, Joel rephrased the essay topic given by Sanit, “How Necessary is a College Education?” to “College Education and Being Successful”. Another sample when Sanit wrote, “Mark Zuckerberg, owner of Facebook.

According to the information from the Biography website said that he did not graduate from college.” Joel rephrased this clause and shortened it, “Mark Zuckerberg, Facebook's Chief, Executive Officer and Founder, is a Harvard University drop out...” This occurrence proved members active engagement on other’s texts. Further evidence of members’ interaction marked by their use of LFs. Figure 5.8 demonstrates some examples of members performing LFs in Task 2.

CW Task 2 (Argumentative Essay)	
<ul style="list-style-type: none"> ▪ Joel:38 ; Sotear:13 ; Sanit: 3 ▪ 41 initiating ; 13 responding 	
<p><u>Examples</u> Joel: Hello! Please write here what topic you want to make. Choose the list suggested by the teacher. Thank you. Sotear: Hello! For my idea this topic like "Should College Students Have Part-Time Jobs While They Study?" is a good one. Sanit: I agree with this topic. <i>(Greeting, Requesting, Suggesting, Acknowledging, Greeting, Stating, Agreeing)</i> Joel: Please think of 3 arguments and 1 rebuttal of your chosen topic, so we'll weigh things on what looks better. Thank you for taking note of this notice. <i>(Requesting, Acknowledging)</i> Joel: This is my suggestion: "How Necessary is a College Education?" my arguments are, having a college degree does not guarantee you a job right away, some successful people do not have a college degree (Bill Gates and Mark Zuckerberg), and more to add. Sotear: Okay we can work on this topic. <i>(Suggesting, Elaborating, Agreeing)</i></p>	<p><u>Examples</u> Joel: Two things in the introduction: 1) Where is the thesis statement? 2) Please refrain from using a first and second person approach. <i>(Stating, Questioning, Requesting)</i> Joel: How did you so say? If you read this from a source, may I request you to add a proper source. If not, I'm afraid this does not sound like an opinion and needs a source. <i>(Questioning, Requesting, No response)</i> Joel: I don't quite get the meaning of this sentence, sorry. Sotear: How about rephrasing it in a different term and you could help with that. <i>(Disagreeing, Eliciting, Agreeing)</i></p>

Figure 5.8 Example of LFs Performed by Group 7 in Task 2

The group employed 54 acts of LFs in Task 2, in which 41 were initiating acts and 13 responding acts. Likewise, Joel performed the most acts (70.4%). The team used distinctive LFs to mean that they showed mutual engagement with peers’ texts. LFs such as stating, requesting, elaborating, and suggesting were employed variedly. As seen from the excerpt (Figure 5.8), Joel invited the members to give a topic. Sotear proposed a topic “*Should college students have a part-time job while they study?*” and Sanit supported it. However, Joel rephrased the topic but kept the original concept. He further came up with points of arguments. This convinced his peers to work on his revised topic. There were incidents Sanit or Sotear failed to respond to Joel’s request. For example, Joel commented on

Sanit's work by asking him to add a proper source when dealing with figures, or when Joel asked his peers to highlight the thesis statement in the introduction, but received no response. However, Sanit corrected those errors as shown in GD archive. Overall, the group led by Joel established a good rapport to scaffold one another across tasks as evidenced by GD history archives. The next subsection discussed interaction patterns manifested by Group 8.

Group 8: Active and Withdrawn (Task 1) --- Cooperating in Parallel (Task 2)

Group 8 consisted of three male students from Malaysia (Eddy), Myanmar (Saw Bochit), and Thailand (Thana). In Task 1, the team composed an essay, "*Becoming a new university student*". From the analysis, Saw Bochit introduced a topic and led the team, but he did not divide workloads to his teammates. He started the introduction and the first body paragraph. Later, Thana built on text in the first body paragraph, but Saw Bochit extendedly revised it and removed Thana's text. This incident refrained Thana from contributing further. Eddy, on the other hand, constructed the third body paragraph and rarely engaged with his peers' texts. In Task 2, the team interaction shifted to a cooperating in parallel pattern when the members constructed their argumenative essay. Thana invited the team to brainstorm for ideas. Saw Bochit interacted with Thana, while Eddy worked passively. To perceive an overview of the team interaction with their peers' work across tasks, the percentages of members' text contributions, frequently used of WCFs, and LFs are summarized in Table 5.3.

Table 5.3 Text Contributions, WCFs, and LFs Produced by Group 8

Group 8	Percentages of contribution (%)		WCFs (frequency counts)				LFs (frequency counts)			
	T1	T2	T1		T2		T1		T2	
			S	O	S	O	Ini.	Res.	Ini.	Res.
Thana	0	49	15	1	25	3	2	0	18	8
Saw Bochit	82	45	36	25	52	15	10	1	24	8
Eddy	18	6	1	2	3	0	4	0	7	3
<i>Total</i>	100	100	52	28	80	18	16	1	49	19

* Ini. = Initiating acts; Res. = Responding acts

As shown in Table 5.3, the members shared unequal texts in both tasks. In Task 1, Saw Bochit dominated the work (82%) and controlled the task and Eddy shared a small portion (18%), whereas Thana withdrew from the team. As seen, the team generated 16 initiating acts on LFs but received only one responding act. Furthermore, the WCFs were mainly produced by one member (76.2%). This indicated that the members lacked interaction. In Task 2, two members contributed nearly equal amount of text, while one member shared little. However, the members' engagement and interaction were increased as reflected by their use of responding acts. Some examples of WCFs and LFs exhibited by the group are shown in Figures 5.9, 5.10, 5.11, and 5.12.

CW Task 1 (Descriptive Essay)	
<ul style="list-style-type: none"> ▪ Thana: 16; Saw Bochit: 61; Eddy: 3 ▪ 52 Self vs 28 Other 	
<p><u>Examples</u></p> <p>Thana: All of us are excited to enter the new schools, see tall buidlings, and the view of its local places. Some of us have fallen agitated when we first got the entrance exam.</p> <p>Saw Bochit added: <i>Most of the international university students can't travel and start their face to face class at Asia- Pacific International University since school has started till now. All of us are excited to enter the new schoolks, see tall building, and the view....(adding, other)</i></p> <p>Thana wrote: In college we certainly encounter various kinds of people, we may know terror man which we can't avoid absolutely.</p> <p>Saw Bochit deleted the sentences: In college we certainly encounter various kinds of people, we may know terror man which we can't avoid absolutely. (deleting, other)</p>	<p><u>Examples</u></p> <p>Saw Bochit: For example, maybe unlike at home, staying at dormitory students must wake up ealier than staying at home and there was a limited time to have breakfast, lunch, and dinner as well. After that at home we don't have as strict rules as staying at the university dormitory.</p> <p>Saw Bochit reordered: After that at home we don't have as strict rules as staying at the university dormitory. <i>For example, maybe unlike at home staying at dormitory, students must wake up earlier than staying at home and there was a limited time to have..... (reordering, self)</i></p> <p>Eddy: If you have any disagreements or conflicts, you must calmly talk with your friends, may be your friends are also bothering. <i>Contradictions may become a hurdle in your heart, which is not good for both parties. (adding, self)</i></p>

Figure 5.9 Example of WCFs Performed by Group 8 in Task 1

The team employed 80 WCFs: 52 instances are on self-text and 28 instances on other-text. Saw Bochit produced the most WCFs (76.2%), followed by Thana (20%), and Eddy (3.8%). From GD archive, Saw Bochit started the introduction, the first and second body paragraphs. Thana added text in the first body paragraph, but Saw Bochit removed Thana's

texts. The removal of text resulted in Thana's withdrawal from the group. One example of text deleted by Saw Bochit on Thana's was when Thana wrote "*In college we certainly encounter various kind of people, we may know terror man which we can't avoid absolutely*". Eddy, on the other hand, worked passively on his third body paragraph. Further evidence of members exhibiting low engagement was marked by LFs initiating acts that received no response. A few examples of LFs employed by the team are portrayed in Figure 5.10.

CW Task 1 (Descriptive Essay)

▪ Thana: 2; Saw Bochit: 11 ; Eddy: 4
▪ 16 initiating ; 1 responding

<p><u>Examples</u></p> <p>Saw Bochit: When you write, don't forget to put descriptive sentences (five sensory = feel, touch, smell, see, taste) <i>(Suggesting, No response)</i></p> <p>Eddy: Change this to the full name "Asia-Pacific International University" instead of AIU. <i>(Suggesting, No response)</i></p> <p>Saw Bochit: I don't clearly understanding this Sentence. What do you mean when yo say, "At this moment we should resolve this embarrasment. as soon as possible so that we can better understand it." <i>(Questioning, No response)</i></p>	<p><u>Examples</u></p> <p>Saw Bochit: I think that we should remove "when" and rewrite this sentence like "Sometimes "when" and communicating with friends, we accidentally can say the wrong things." <i>(Suggesting, No response)</i></p> <p>Thana: I wrote my part but you can make edit if you like. <i>(Stating, No response)</i></p> <p>Eddy: I suggest to add this phrase after this line "...we accidently can say the wrong things, which is likely to cause each other to fall into an awkward situation." <i>(Suggesting, No response)</i></p> <p>Thana: I suggest to add some information in the first body paragraph. <i>(Suggesting, No response)</i></p>
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Figure 5.10 Example of LFs Performed by Group 8 in Task 1

The group performed 17 acts of LFs in Task 1: 16 initiating acts and 1 responding act. Saw Bochit employed the most LFs (64.7%); however, his suggestions received no response from his partners. As seen from the excerpt (Figure 5.10), when he posed a question, "...what do you mean when you say, "At this moment we should resolve this embassment as soon as possible...?"", but no one responded to his question. Other samples when he suggested Eddy to remove the adverbial clause "when" in the sentence "I think that we should remove "when" and rewrite this sentence..." Eddy did not respond. This inferred that the members lacked interaction and negotiation while

composing their essay. This might be a feasible reason to cause Thana to leave his group. In Task 2, the group interaction switched to a “cooperating in parallel” pattern when two members led the group while co-constructing their argumentative essay “*College students and part-time jobs*”. The analysis from GD archive showed that Thana initiated the topic, and was supported by Saw Bochit. Thana wrote the introduction and the first body paragraph, whereas Saw Bochit worked on the second body paragraph. Eddy wrote the third body paragraph. From GD history revision, Saw Bochit added texts on Eddy’s paragraph, revised it, and concluded the essay. A few examples of WCFs performed by the team are displayed in Figure 5.11.

CW Task 2 (Argumentative Essay)	
<ul style="list-style-type: none"> ▪ Thana: 28; Saw Bochit: 67; Eddy: 3 ▪ 80 Self vs 18 Other 	
<p><u>Examples</u></p> <p>Eddy : When college students do part-time job, some college students are relatively weak in frustration, such as handing out flyers on the roads.</p> <p>Saw Bochit deleted: When college students do part-time jobs, some college students are relatively weak in frustration, such as handing out flyers on the road (<i>deleting, other</i>)</p> <p>Thana: College students can find suitable part-time jobs and get paid through their own efforts, but the premise is that they will not delay normal study and life while doing part-time jobs. As a</p> <p>special group, college students must not only focus on learning, but also comprehend society.</p> <p>Saw Bochit reordered: <i>On the whole as a special group...also comprehend society. Therefore college student can find suitable part-time jobs...</i> (<i>reordering, other</i>)</p>	<p><u>Examples</u></p> <p>Saw Bochit: The responsibilities of work will train students to be different from the students who do not work. It is because part-time workers always realize themselves to be enthusiastic about their responsibility such as coming on time. <i>Though working part-time jobs benefit students in many ways, Some people might say that part time jobs may affect students' grades and health issues.</i> (<i>adding, self</i>)</p> <p>Saw Bochit: Wang and Chen (2017) mention that 74% of students would like to reduce their family's financial burden 74.6% working part-time to increase their future job competition (volume -1, page 1-4).</p> <p>Saw Bochit rephrased: <i>Wang and Chen (2017) found that 74 % of students engaging in the study claimed that part-time jobs can reduce their family's financial burden, whereas 74.6 % asserted that part-time jobs help increase increase their opportunity to get employed (pages 1-4).</i> (<i>rephrasing, self</i>)</p>

Figure 5.11 Example of WCFs Performed by Group 8 in Task 2

The team produced 98 WCFs in Task 2: 80 instances on self-text and 18 instances on other-text. Of those WCFs, Saw Bochit generated 76%, whereas Eddy used the least WCFs (3%). The group cooperated in parallel, in which the members shared division of work and occasionally engaged with their peers’ texts. A few examples of members’ engagement on peers’ texts are shown in Figure 5.11, such as deleting other’s statements, reordering

peer's sentences, adding or rephrasing self-text. Although the team produced more instances on self-text, there was sufficient evidence verifying that the members interacted with each other. Further proves are reflected by their use of LFs. A few examples of LFs elicited by the team are illustrated in Figure 5.12.

CW Task 2 (Argumentative Essay)	
■ Thana: 26 ; So Bochit:32 ; Eddy: 10 ■ 49 initiating ; 19 responding	
<p><i>Examples</i> Saw Bochit: Does the university allow students to work on campus while studying? Thana: Yes they do, but students will get less money than When they work outside campus. Saw Bochit: Oh I see, thank you. So the suggestion is our topic for this essay is "Should college students have part-time jobs while they study"?" Thana: Ok let's get that one. Should we divide the duty to start our essay?" Saw Bochit: Yes ok. <i>(Questioning, Agreeing, Stating, Acknowledging, Suggesting, Agreeing, Suggesting, Agreeing)</i></p> <p>Saw Bochit: We should have three supports the thought and one is opporite right? Let's start the introduction first. Thana: OK, I'll do the introduction. <i>(Stating, Suggesting, Agreeing)</i> Thana: How about the support, any idea? Saw Bochit: I do not get it yet. <i>(Eliciting, Stating)</i> Saw Bochit: I am going to start the second body paragraph Thana: Yes, take time to write. <i>(Stating, Agreeing)</i></p>	<p><i>Examples</i> Saw Bochit: I think when you add this source, this paragraph looks stronger than before. <i>(Suggesting, No response)</i> Eddy Chan: I moved this sentence "Some people might say that part-time jobs may affect students' grades and health issues..." to paragraph 6 before the conclusion. Saw Bochit: Thanks <i>(Stating, Acknowledging)</i> Thana: How about this sentence, it's also counterargument. Eddy Chan: Yes, it is. <i>(Eliciting, Agreeing)</i></p> <p>Saw Bochit: How about if we write like "If students have chances to get part-time jobs; it could save the primary source of income for reducing their parents' expenses." <i>(Eliciting, No response)</i> Eddy Chan: How about a refutation paragraph any idea? Saw Bochit: We're going to finish this soon. Thank you friends. <i>(Eliciting, Stating, Acknowledging)</i></p>

Figure 5.12 Example of LFs Performed by Group 8 in Task 2

The team generated 68 acts of LFs in Task 2: 49 initiating acts and 19 responding acts. Similar to Task 1, Saw Bochit produced the most LFs (47%). The varied use of LFs include eliciting, stating, suggesting, questioning, acknowledging, and agreeing indicated that members interacted with peers' texts although their direct intervention on peers' work was not clearly detected, except a few incidents when Saw Bochit built on Eddy's paragraph. Some illustrations of members producing LFs are shown in the excerpts (see Figure 5.12). For example, prior to getting a topic, Saw Bochit asked Thana if the university provides work program for students. Thana gave further information. Then Saw Bochit agreed with the topic Thana proposed, "*Should college students have part-time jobs*

while they study?”. Another example when Saw Bochit suggested the partners to come up with three supports and a refutation paragraph, “We should have three supports the thoughts...Let’s start the introduction first.” Thana agreed to write an introduction, “OK, I’ll do the introduction.” This phenomenon evinced that to some degree the team supported each other either directly or indirectly.

5.2 Summary of Interaction Patterns of the Selected Cases

Group 1 exhibited a collaborative interaction in Task 1. The members shared the workloads proportionally and made a collective contribution. Scaffolding strategies were obvious as marked by their utilization of WCFs and LFs. Reciprocal scaffolding was indicated as a double-headed arrow (\longleftrightarrow) in Figure 5.13. However, the interaction pattern shifted to “dominant and defensive” when scaffolding and mutual interaction were absent (non-scaffolding was marked as dotted line (.....)). The length of time spent in collaboration was brief in Task 2, and the use of WCFs and LFs were reduced drastically. The members failed to respond to LFs initiating acts. The group interaction patterns are summarized in Figure 5.13.

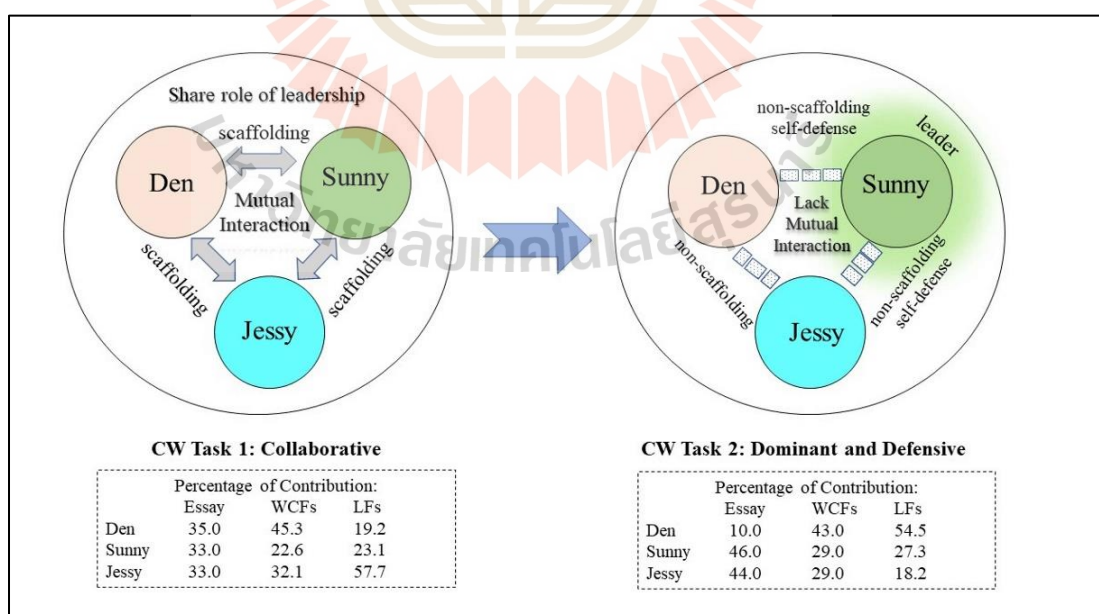


Figure 5.13 Dynamic Interaction of Group 1

Move on to Group 7 whose members' interaction patterns remained stable. The group demonstrated an "expert and novice" stance across tasks. Joel positioned himself as a supportive leader who provided ample scaffolding to his teammates. Sotear and Sanit positioned themselves as novice writers who responded actively to their leader's comments. The triad interacted positively while co-constructing their essays. Joel designated workloads to the members in both tasks and scaffolded them with language challenges. Although the use of LFs in Task 2 was reduced drastically, particularly Sanit who employed only three acts, the triad showed responsibility to complete their parts, in which later proofread and edited by the leader. The team's patterns of interaction across tasks are concluded in Figure 5.14.

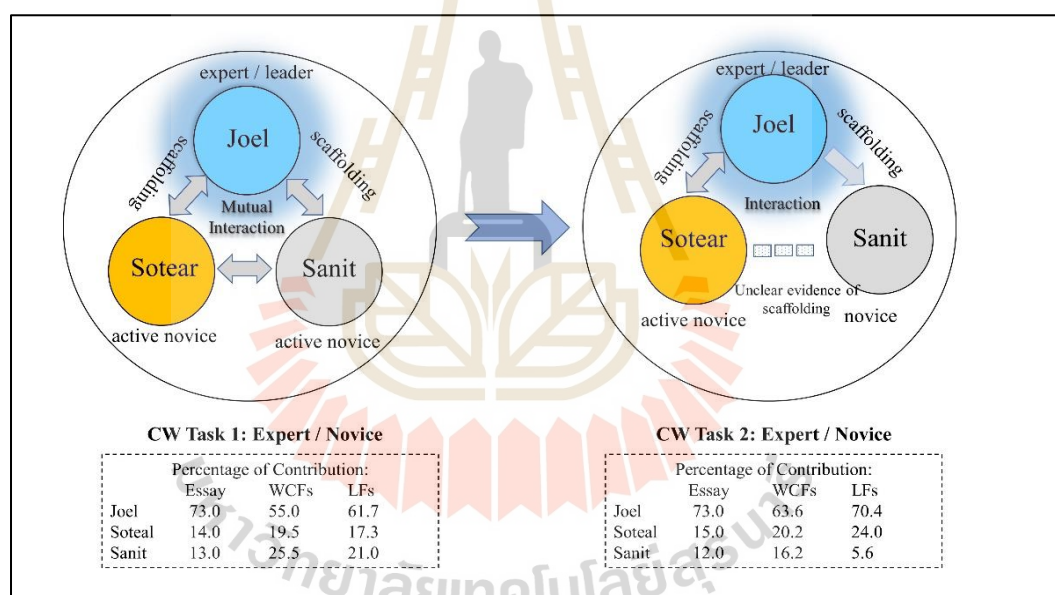


Figure 5.14 Dynamic Interaction of Group 7

Move on to Group 8 whose members shifted their interaction patterns while performing two tasks. Group 8 manifested "active and withdrawn" pattern of interaction in Task 1 when one member withdrew from the team. The leader controlled the task and received minimal help from another member. Little scaffolding was marked when the leader assisted the member who contributed a small portion. Group interaction was in a low scale. However, the interaction pattern shifted to a "cooperating in parallel" in Task

2 when two members shared leadership role. Scaffolding was apparent and reflected through their use of WCFs on *other-text* and initiating and responding acts of LFs. The members scaffolded each other in constructing texts. Overall, the team showed mutual interaction while producing their second essay. The group interaction patterns across tasks are concluded in Figure 5.15.

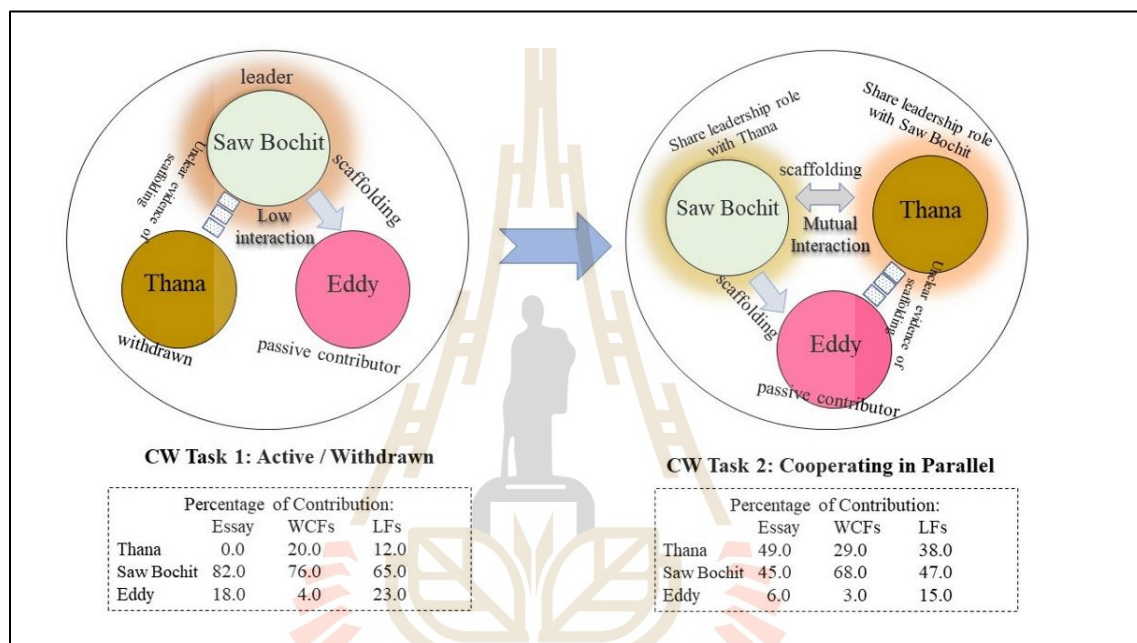


Figure 5.15 Dynamic Interaction of Group 8

The overall results from the exploration of three groups engaging in two CW tasks via GD revealed that the teams exhibited dynamic interaction patterns across the two tasks. The members' roles helped shape their contributions and interactions. The findings revealed that when a group leader designated a clear responsibility to the members, interaction, task negotiation, engagement, and scaffolding would emerge unprecedentedly. On the other hand, when members' roles were obscure, negotiation on task, and interaction among the team were low, which resulted in unequal workloads and lack of collective knowledge construction.

5.3 Learners' Deployment of Linguistic Repertoire

This section discussed a brief overview of how learners in the selected cases deployed their linguistic repertoire to support their CW tasks. Data were drawn from interviews and observations.

Group 1

The team consisted of members whose parents speak English. Sunny was raised speaking English and enrolled in an English medium school at his young age. Although his parents use Hindi and Tamil at home with the grandparents and relatives, those heritage languages have no influence on his English learning experience. Sunny shared that he had officially learned English for about 15 years from primary school and he could use it spontaneously as if it were his first language. When asked if his parents' heritage languages have any impact on his English writing, he gave a confident response 'definitely not'. He further remarked, *"I'd rather write in English than other languages, and I feel more comfortable using English than Hindi."* His claim could reflect through his CW behaviours in both tasks. When Sunny constructed sentences, he rarely revised them for his writing is grammatically correct. His English language competency impelled him to create writing territory, take leadership role, and compose his essays confidently for he had language competence.

Jessy, on the other hand, grew up in a Filipino family, and his parents speak both Tagalog and English at home. He was enrolled in a bilingual school where both Tagalog and English were used as mediums of instruction. Jessy recalled his English learning experience officially started when he was in grade 3. Although at home, he codeswitched between Tagalog and English in daily conversations with his parents and relatives, he had positive attitude about English as he perceived the language *"a powerful tool to help me find an ideal job and build my future."* He remarked that in high school, English was used in mathematics and sciences, whereas Filipino was used in other subjects include social studies, physical education, geography, and history. When asked if Tagalog influences his writing in English, He replied, *"I'm not sure if my native language does influence my English writing, but it may influence the way I process things in mind when I write."* From

the CW assignments, Jessy contributed actively in both tasks. He had a good command of English and expressed his ideas comprehensively although his mother tongue may influence his thought process in some ways. However, his English background supported him to express thoughts fluently.

Den came from Sabah, Malaysia. He was raised in a Kadazandusun family where his parents speak three languages: Dusun, an ethnic dialect, Bahasa Malaysia, and English. Den's parents worked for a religious-based organization, so he was enrolled in a Christian international school where English is used as a medium of instruction. Like Jessy, he codeswitched between his parents' heritage language and English in daily conversation at home. At school he was compelled to use English because his classmates came from linguistically diverse backgrounds; however, he conversed with his local peers in Malay language. He noted that, *"In writing I prefer using English rather than Malay and I was trained to write in English extensively in upper primary level, although at home we use our native language."* From the observation of his CW behaviour, Den reduced his engagement in Task 2 by claiming that he would rather proofread their peers' texts and provide suggestions if needed since he realized his teammates had good command of English.

We may conclude that all the triad members in Group 1 came from English-medium backgrounds from primary and secondary education, and their CW processes did not take long although they were given plenty of time to polish their group tasks. Furthermore, the team did not make many changes regarding language issues as noted from their employment of WCFs. The group could complete the second task within a few days. This was due to their prominent assets of their English education background in that they could construct the essay within a short time.

Group 7

The members' language proficiency levels were varying. Joel came from Manila and was brought up speaking Tagalog and English at home. He was enrolled in a public school nearby his hometown where the school operated on bilingual education programs: Filipino and English. Joel remarked, *"At school, English was emphasized when I started grade 3."*

He shared that school subjects, including mathematics and science, were entirely taught in English by local Filipino teachers. Therefore, he felt convenient using the language in class and outside classroom. At home he codeswitched intuitively between Tagalog and English. Joel perceived that in the Philippines, English is used as one of the official languages. He expressed, *“In the Philippines, English is spoken broadly and it is not strange to hear people talking and mixing between English and Tagalog.”* Joel’ English ability helped him to write confidently and unreluctantly assisted his peers’ texts when the team constructed two CW tasks. He scaffolded his peers in both tasks and dedicated time to revise his peers’ work.

Sotear, on the other hand, grew up in Phnom Penh and attended a local public school where Khmer language was used as a medium of instruction. Her parents spoke Khmer to her at home. She started learning English as a foreign language when she joined a faith-based school in grade 7, but she did not take English seriously. English was used only during class hours when the language subject was taught in school. Sotear noted that she and her classmates did not get to practice English outside of the classroom, but communicated in Khmer, the national language. When asked if her mother tongue influenced her writing in English. She promptly responded, *“Yes, my native language affects my writing a lot. When I form my thinking to write, I think in Khmer language first.”* Sotear shared that oftentimes the topics pop up in her mind and she would process the information in Khmer right away and translate it in English later. She admitted making interlingual errors oftenly when she composed English texts, such as errors on grammatical features on subject+verb agreement, wrong verb form, and semantic features (e.g., unclear/incomplete meaning). She perceived her mistakes in English writing caused by the differences in language features between English and Khmer. She admitted using Google to search examples of English sentences or lexical bundles to support her writing. In the two CW tasks she participated, Sotear involved actively while receiving support from her group leader, Joel. She contributed her assigned section to the team despite the language barrier she had.

Another member in Group 7 was Sanit, a Thai resident from the northern province of Chiang Rai. Sanit was raised in a Hmong ethnic family but enrolled in a Thai public school since his young age. At home he used Hmong dialect, his parents' heritage language. However, at school he communicated only in Thai with his classmates. He shared that he started learning English when he was in grade 4, but he only learned to read and write English alphabets, numbers, days of the week and months of the year, and nothing more. In secondary education he recalled learning basic English grammar, but never had chances to practice the language outside the classroom. He commented, *"In high school we learned English with Thai teachers, and we must memorize a lot of vocabulary and recite them to the teachers by giving their meanings, but did not get to apply it in real-life."* He perceived his English was still in pre-intermediate for he did not have chances to hone the language skills. When asked if Thai language influences his writing in English, he admitted it with a 'yes'. He confessed that, *"In high school I only learned to write short paragraphs in English but not an essay. We learned to write by using examples from textbooks to guide us,"* He stated that he was worried when he had to co-construct essays with peers who he had never met. Sanit shared his writing strategies that sometimes he typed the text in Thai language when the sentences are complicated, and translated into English. He used free translation applications such as Google translation or Microsoft translator to assist his writing. Sanit noted that, *"When I write in English, I was careless sometimes if my sentences are complete or not, or I make mistakes on verb tenses, or forget to put punctuations."* This claim might be due to language interference that Thai has no conjugation of verb form or punctuation rule. This caused Thai students, including Sanit to produce language errors when he constructed texts in the target language – English.

The triad collaborated successfully in both tasks despite language barriers the other two members held. With language privilege and abilities Joel had, he led and scaffolded his peers in both tasks confidently. He took initiatives, started conversations in GD chat window and led the team to collaborate. The less-capable partners put their endeavours, employed their linguistic repertoires to assist in expressing texts in English, received advice

from the leader, and learned to improve their writing skills. The team invested adequate time in revising, proofreading and editing texts throughout the writing process. In short, the group exhibited effective team collaboration.

Group 8

Group 8 consisted of members coming from limited English backgrounds. Saw Bochit was raised in an ethnic Poe Karen family that lived in Hlaingbwe Township, Myanmar. His parents' heritage languages are Karen and Burmese. At home, he was raised to speak ethnic Karen dialect and Burmese, his national language. He was enrolled in a local school where Burmese was a medium of instruction; however, English subject was taught in his primary school by a local teacher. Outside classroom, English was rarely spoken. Saw Bochit recalled that, *"I only learned English to fulfill the requirement from school curriculum, but we didn't use it outside school. Our environment didn't permit us to do so."* However, in high school he realized the importance of English as a language for career opportunities and overcoming poverty since his parents were illiterate. He stated, *"When I was in grade 10, I started learning English rigorously to apply for scholarships so I could learn in a better university outside my country."* In 2020, he received a scholarship to pursue his college education in Thailand. When asked if his heritage language influences his learning of English, he acknowledged it and asserted that Burmese language influences his writing in English in some ways, *"I make mistakes on grammar and mistakes of tenses, because in Burmese we don't have tenses and different forms of verbs. I also make mistakes on word order and sometimes run-on sentences."* Similar to Sotear from Group 7, Saw Bochit admitted using Google search to help him in stringing English sentences when he came across collocations or lexical chunks. Although Saw Bochit perceived writing in English as a foreign language was strenuous, he demonstrated courage to lead his peers in constructing both tasks.

Thana, on the other hand, grew up in an ethnic Hmong family in the northern province of Chiang Mai. His parents speak Hmong and Thai. He was enrolled in a Thai elementary school in Chiang Mai province and moved to a private school when he started secondary education. His learning of English began in grade 7; however, like many other Thai students

in rural schools, he learned English in class by following textbooks, practicing grammar rules in class, doing assignments, taking exams to pass the requirements, but he rarely had chances to use the language outside the classroom. Thana remarked, *“Like in Thai school, students don’t have opportunities to speak English with foreigners. We only learned English in classroom and outside the class, we speak Thai all the time.”* This is an undeniable fact that Thai students have limited exposure to English in daily life due to unsupportive atmosphere and cultural practices, except those who are enrolled in bilingual program or international schools where learners are not only Thai residents. Like Sanit from Group 7, Thana asserted, *“In secondary school we practiced writing an essay a little, but followed the patterns given by the teachers such as filling in the blanks.”* When he was engaged in the CW tasks, Thana hesitated to join at first, but he gained courage to take on his part and even shared a prominent role in the second task. He admitted that, *“I used Google Translation to help me when I came across ideas that I want to express in English but I got stuck.”* Thana employed a similar strategy like Sanit from Group 7, by making use of free language translation applications to assist his writing.

Eddy came from a Malaysian Chinese family. He was brought up speaking Chinese at home and some Malay. He was enrolled in a public school where Malay was used as a medium of instruction. He learned English when he started his secondary education, but at home his parents used Chinese with him. To him, English is a foreign language although it is a compulsory subject to learn at school. Eddy noted that, *“At school we learned English and the teacher pushed us to speak English. But at home, we used our Chinese to talk to each other and we hardly speak English.”* When asked if his native language affects his writing in English, he confessed that his Chinese influences his writing. He shared, *“When I need to write in English, I process my thoughts in Chinese and then translate it to English sometimes. I mix Chinese grammar with English grammar in the sentences that results in grammatical errors.”* This incident occurred to Chinese learners, including Eddy, who used reasoning process based on their L1 background, which results in language errors produced in the target language. Eddy was found to rarely contribute in both tasks when he was engaged in the CW essays due to his language barriers and low self-confidence.

We may infer that the team whose individual members experienced language challenges due to limitations and practice opportunities, or stronghold of heritage language imposed by families, relatives, and friends in the community, were able to produce two online CW tasks in GD. This phenomenon occurred due to members involvement in the process of trial and error, venturing oneself by supporting each other, making use of language resources individuals had in completing the group task.

In conclusion, this chapter drew on a case study in exploring three small groups engaging in two CW tasks using GD in an English composition course. The dynamic interaction patterns of these small groups, whose members were culturally and linguistically diverse, were investigated based on their contribution of texts (charged through DocuViz) and task negotiation and interaction with peers elicited by their utilization of WCFs and LFs gleaned from GD archives, and their deployment of linguistic repertoire. The next chapter presents the discussion of the research findings concerning learners' writing performance after engaging in CW tasks, pattern of interaction exhibited by small groups, learners' use of WCFs and LFs in CW tasks, and learners' perceptions of CW in GD.



CHAPTER 6

DISCUSSIONS

This chapter delineated the discussions of the research findings. It started with a restatement of research questions and results related to: 6.1) learners' improved writing performance in an argumentative essay after participating in two extended CW tasks; 6.2) learners' contributions and group dynamic patterns of interaction; 6.3) learners' use of WCFs and LFs in CW tasks; 6.4) learners' perceptions of WBCW in GD; and 6.5) multilingual learners and CW tasks. In what follows, a detailed discussion was initiated to address the results of the following four research questions.

Question 1: Do collaborative writing tasks help to improve learners' writing performance in an argumentative essay? If so, how?

Question 2: What patterns of interaction occur when learners engage in collaborative writing tasks via Google Docs?

Question 3: What are the writing change functions and language functions used in collaborative writing when learners are engaged in writing tasks?

Question 4: What are the learners' perceptions of the web-based collaborative writing experience in Google Docs?

6.1 Discussion on Learners' Improved Writing Performance

The learners demonstrated an improved writing performance in an argumentative essay after engaging in two extended CW tasks when compared to their pre-test writing. Learners' improved writing performance was marked by the increase of mean scores for each language domain defined in the scoring rubric that includes content, organization, vocabulary, language use, and mechanics. The findings of the present study were congruent with some previous studies (e.g., Alghasab et al., 2019; Ardiasih et al., 2019; Bailey & Judd, 2018; Bikowski & Vithanage, 2016; Bhowmik, et al., 2018; Chen, 2019;

McDonough et al., 2018) whose studies claimed that CW activities help develop academic writing skills. Adding to the previous findings, this present study was able to denote that WBCW activities play vital roles in improving learners' writing performance pertaining to language specific domains.

6.1.1 WBCW improved learners' writing performance

The WBCW instructional instrument used consisted of two CW lesson plans on descriptive and argumentative essays constructed based on sociocultural theory, which posits that learners' cognitive development derives from social interaction (McKinley, 2015; Pritchard & Woollard, 2010). Through CW activities and peer scaffolding, learning becomes more dynamic and interactive, and knowledge is absorbed which subsequently results in individual writing development (Chen, 2019; Liu et. al., 2018). CW practice and active involvement in a group project have proven to enhance a cognitive advantage that influences knowledge gain on an individual level (Alghasab et al., 2019; Latifi, Norrozi, & Talaei, 2021; Thienmann, et al., 2019; Qiu & Lee, 2020). The WBCW enhanced writing performance in terms of content (knowledge of topic, substantive and thorough development of thesis); organization (ideas clearly stated, well-organized, and logical sequencing); vocabulary (word choice, usage, and appropriate register); language use (effective construction, correct tense, correct use of articles, pronouns, and prepositions); and mechanics (spelling, punctuation, and capitalization), based on the analytic rating scale. The findings were congruent with Chen's (2019) and Latifi et al.'s (2021) studies, which reported that students who were exposed to CW practice and received peer feedback outperformed their peers who were not exposed to CW practice concerning language accuracy and text quality. Learners subsequently produced better quality of work on an individual basis in a delayed post-test writing. In other words, the benefits of CW tasks can be translated into higher scores on subsequent individual writing. This is because learners in CW classrooms scaffolded each other's texts through negotiation, in that individuals with different language proficiency levels and cognitive abilities shared linguistic resources with one another to develop better organization of ideas and increase the written texts (Alghasab et al., 2019; Bailey & Judd, 2018; McDonough et al., 2019;

Vorobel & Kim, 2017; Zhang & Hyland, 2018). Moreover, learners produced longer texts after engaging in CW activities. This occurrence is explained in the following.

6.1.2 WBCW helped learners produce more extended texts in an argumentative essay.

For the present study, the pre- and post-test argument writing was employed to measure the effects of learners' writing performance after receiving the intervention. Learners were exposed to CW activities in producing academic essays. However, the researcher chose only two distinctive genres: description and argument, which noted to be the least versus the most challenging genres of academic writing (Schneer, 2014), for learners in small groups to jointly compose texts spanning three weeks for each CW task. The findings revealed that learners experienced writing gains by producing a more extended argumentative essay after engaging in WBCW activities. Previous studies (e.g., Krishnan et al., 2018) also reported that students' group written essays were found to have better command of evidence and greater control of writing conventions. Students wrote longer texts with more complex sentences or clauses compared to those who composed essays independently (McDonough et al., 2018). Learners produced longer sentences, and more clauses embedded in independent clauses, which resulted in more complex sentence structures in their post-test writing. The findings were congruent with previous studies (e.g., Lu, 2011, 2017; Qiu & Lee, 2020) whose research found that the essays which received higher scores tended to have longer clauses with complex sentences. This might be because the accumulated experiences from co-constructing group essays propelled learners to internalize knowledge gained into their subsequent writing performance. Lantolf and Thorne (2007) posited that our cognitive function would orchestrate what was being procured for future performance when the mental process was stimulated. Furthermore, in the current study, learners were exposed to some argumentative essay models. The essay models include outstanding thesis statements, solid reasoning and evidence to support those stances with illustrations, research, text citations, and opposing viewpoints with counterargument and refutation technique, in

which the use of such debate method will engage writers in maintaining their attention and honing critical thinking ability (Mokhtar et al., 2020). Learners were drilled to provide sufficient details for each body paragraph while engaging in CW tasks. This practice enabled them to produce extended texts in the subsequent post-test writing. As advocated by ST2 and ST12 in the interview.

“...working collaboratively helps me learn some good techniques from my leader who often reminds us to give sufficient information and explain with elaborate details in whatever we want to discuss in a paragraph...” (ST2- Interview)

“...For me, I think when we write in group, we have more ideas. This is helpful because we can also use other people’s opinions when we work on our own essay...”
(ST12- Interview)

This was because during the CW process, learners had opportunities to generate language output, express one’s views explicitly, and negotiate on meaning making in order to reach the consensus (Elabdali, 2021; Abram, 2019). In consequence, learners improved their overall writing performance concerning language specific domain as discussed in the following.

6.1.3 WBCW improved learners’ overall performance of domain-specific language

Academic writing, such as an argument essay, has a well-structured organization with a clear outline defining a point of view, solid reasoning with a defensible claim and supporting evidence to convince readers (Lee & Deakin, 2016). A crucial element of argument writing requires a writer to communicate messages with a clear stance and enthrall his audience in the text (Wingate, 2012). For writers to establish this norm of academic writing and convey particular information, they need to consider three crucial components: evidentiality (author’s commitment to reliable source being presented), affect (personal and professional attitudes toward what being stated), and presence (author projects himself or herself into the writing which includes the use of hedges, boosters, attitude markers, and self-mention (Hyland, 2008). The domain-specific language

use of the learners' post-test writing demonstrated a measurable progress after they had engaged in group tasks. Learners employed a broader range of hedging and boosting devices, and used a variety of conjunctions that bridge the flow of ideas within a paragraph or between paragraphs to show coherence and unified text. They deployed varied types of reporting verbs (Hyland, 2002) which make the argument more poignant. These findings indicated that the CW activities had a positive impact on learners' individual argumentative essay writing. This can be further discussed through sociocultural perspective in Figure 6.1.

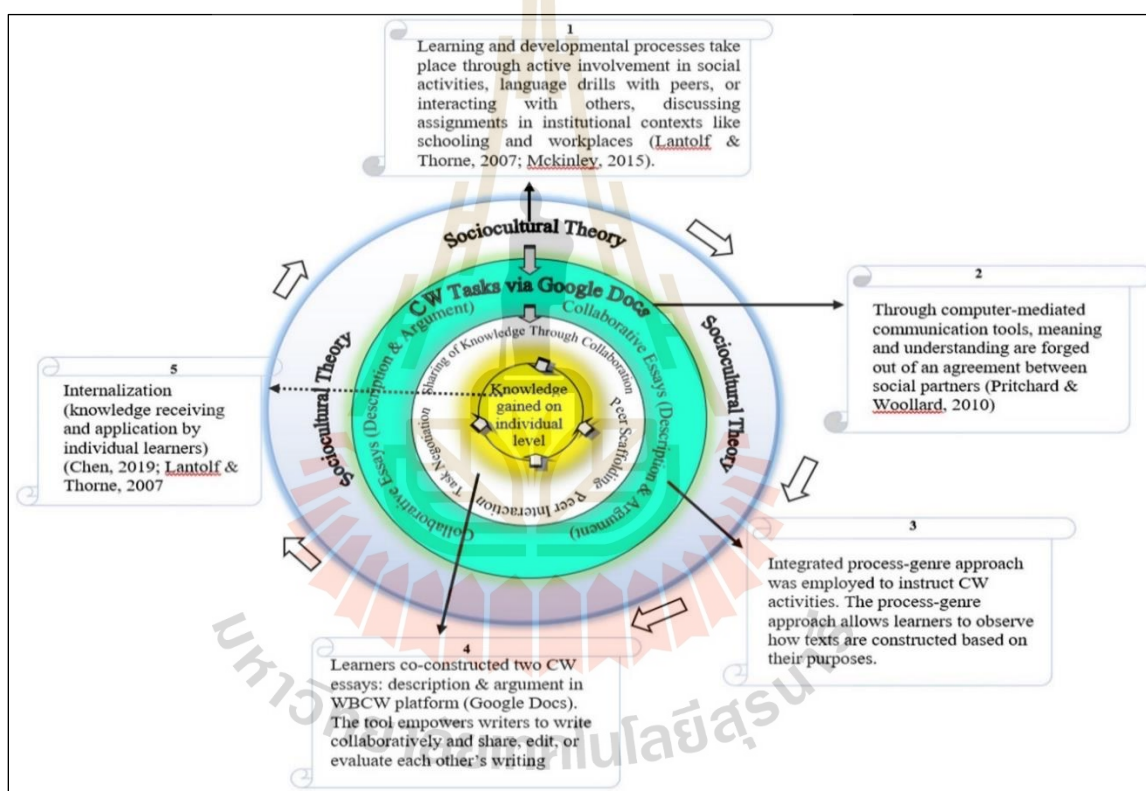


Figure 6.1 Sociocultural Perspective Explaining Learners' Writing Performance

Learners in a collaborative classroom are exposed to diverse thoughts, language-related features, linguistic inputs, and thus meaning and understanding are forged out by peers (Pritchard & Woollard, 2010) during task negotiation via GD. Such collaborative phenomenon challenged their critical thinking skills while processing

information, and later learners would internalize the acquired knowledge, and subsequently improved on self-writing performance (Abrams, 2019; Chen 2019; Elabdali, 2021; Latifi et al., 2021; Qiu & Lee, 2020). Based on Vygotsky's sociocultural theory, this learning process is called "self-regulation" (the ability to accomplish a task with or without external assistance) and "internalization" (the process of mental function manipulating required information for future utilization (Lantolf & Thorne, 2007).

In the present study, the researcher integrated the process-genre based writing approach (Badger & White, 2000; Rusinovci, 2015) to hone learners' writing skills while engaging in CW activities. Students learned from descriptive and argumentative essay models, and noticed distinctive patterns of lexis, syntactic structure, rhetorical device, and specific purpose of each genre (Hyland, 2007). After the learners had been exposed to the essay organization, structure, and language register, they were encouraged to apply writing process that has multiple-level process which includes planning, drafting, peer review, rewriting, proofreading, and publishing the final draft (Curry & Hewings, 2003; Lim & Phua, 2019; Rusinovci, 2015). Learners were given ample time to negotiate on tasks prior to co-constructing their essays. They could write, share, revise, edit, or evaluate their peers' texts freely (Li & Storch, 2017; Thienmann et al., 2019; Williams & Beam, 2019) deploying either synchronous or asynchronous mode in GD (Abrams, 2019; Hsu, 2020; Nykopp et al., 2019; Yanguas, 2020). During the CW process, learners engaged in peer interaction, and with the scaffolding of a more knowledgeable peer, the knowledge was generated (Vasodavan et al., 2020). This occurrence enabled learners to enhance their cognition within the level of the ZPD, and by synthesizing peers' comments, they could process and reorganize the information while producing their own text (Kent, 2016). Likewise, learners were engaged in two extended CW tasks prior to attempting the post-test writing, their learning experience, peer scaffolding, and accumulated knowledge improved their writing performance on content, organization, vocabulary, language use, and mechanics. This assertion was supported by learners' reflection on advantages of CW activities.

“...when we composed text together in Google Docs, we supported one another. Normally, our friends with good writing skills will correct our sentences. We can learn from each other and develop our writing...” (ST6 – Reflection)

“...I never did collaborative writing before, but I found it impressive because we came up with lots of good ideas and that help me to improve my writing too when I have more ideas to discuss...” (ST11- Reflection)

The findings explained Vygotsky’s notion of sociocultural theory that cognitive skills and writing development occurs when learners are involved in social interaction, receiving feedback from more knowledgeable peers, and that knowledge can transit to an individual (Amineh & Asl, 2015; Lopez-Pellisa et al., 2021; Zhang & Lin, 2018).

6.2 Learners’ Contributions and Group Dynamic Patterns of Interaction

Informed by earlier studies on Storch’s dyadic patterns of interaction in CW (2013) and Li’s (2014) interactional dynamics of small groups performing CW tasks in a wiki-based writing platform, the present study further explored patterns of interaction when small groups of three to four culturally diverse students from Asian countries co-constructed descriptive and argumentative essays in GD. Their CW styles were charted by DocuViz, which can observe learners’ CW behaviour and discover how group members write, edit, and revise their essays from scratch to final product (Olson et al., 2017). The tool can display a variety of CW styles. In the study, a CW style was marked by learners’ engagement and their percentage of contributions toward group work, whereas patterns of interaction were further analyzed through members’ balanced participation in text co-construction and mutual interaction with each other including their use of WCFs and LFs.

The present study revealed seven distinctive patterns of interaction, namely, collaborative, cooperating in parallel, dominant and passive, dominant and defensive, expert and novice, active and withdrawn, and failure interaction. Whereas the group CW styles emerged from DocuViz data visualization and analysis displayed five CW styles including collaborative style, cooperative style, divide and conquer style, main writer style, and non-collaborative style. These learners in small groups performed the same writing

genre with similar topics, and they were allocated the same length of time to complete the tasks; however, their interaction patterns and CW styles were dynamic and divergent and deserve close examination to explain the dynamic patterns of interaction and CW styles. The triangulated data sources from the semi-structured interview, the open-ended post-task questionnaire, and student reflections assisted the researcher to unpack learners' engagement in CW tasks and the factors that influenced their interaction and CW behaviours. The factors influencing small group interaction patterns and CW styles are discussed in the following subsections.

6.2.1 Individual Goals

Six major themes emerged from the qualitative data analysis of learners' goals concerning fluidity of interaction patterns and CW styles: (1) getting a good grade, (2) producing a good quality essay, (3) completing tasks on time, (4) improving writing skills, (5) improving communication skills, and (6) building friendship and learning new things. These goals that individuals held influenced their interaction and contribution to group work. Members with a determined goal of getting a good grade and producing a good quality essay occupied more writing space, established their fixed position, and contributed more texts. The findings were in line with previous studies (e.g., Alhadabi & Karpinski, 2020; Cho, 2017; Li & Zhu, 2017; Wang, 2019). These researchers found that learners with a determined goal of earning good grades would pay more attention to academic performance and actively get engaged in group work. The two following excerpts articulated by dominant contributors in Group 7 and Group 9 whose goals were earning a good grade and producing a high-quality essay supported this claim.

“...there are two major goals I have when I collaborated with my partners, which are acceptable quality of work and pass the course with a flying color grade...” (Interview with ST3 from Group 7, Dec 8, 2020)

“...my main goals were to compose a great essay because writing a good essay will reward me with a perfect grade by the end of the course...” (Interview with ST7 from Group 9, Dec 11, 2020)

On the other hand, learners whose goals were to improve writing or communication skills, or build friendship and learn new things, would rather be reasonable contributors, and followers, and these learners would play a subordinate role while performing group work. The two following excerpts expressed by the members in Group 7 and Group 8 asserted this notion.

“...As for me my goal in writing together is to improve my writing and learn from othermembers. This will help me to write better too...” (Interview with ST28 from Group 7, Dec 8, 2020)

“...for the goal of group work for me is to improve my communication skills and learn how to work with people with different cultures and that will give an opportunity to make new friends...” (Interview with ST26 from Group 8, Dec 11, 2020)

We may conclude that individual goals shaped the group interaction patterns and CW styles; however, a shared goal to complete the task and produce a fine-grained essay with mutual support from all members must be resonated and ensured that the success of CW derives from collective endeavours. All group members must have a valid reason to claim their co-authorship of the collaborative task.

6.2.2 Learners English Proficiency Level

Learners with higher English proficiency levels took a more active role in CW since they have a distinct advantage over their less capable peers concerning linguistic resources. Their language asset helped them to express thoughts more freely and they could rectify language mistakes faster. Consequently, their contributions marked a positive impact on the final product of writing. On the contrary, learners with lower language proficiency were reluctant to contribute for fearing of making errors. These findings are congruent with previous studies (e.g., Dong & Liu, 2020; Hsiu-Chen, 2019; Storch & Aldosari, 2013; Teng, 2021), in which these researchers found that competent learners would produce more language-related episodes, put more efforts into the work, and be able to resolve language-related issues more successfully. On the contrary, learners with limited linguistic resources passively contributed to the group task (Hsu, 2020; Zhang, 2019).

Additionally, the quantitative data analysis further supported this claim when learners' English proficiency level was moderately related to their percentage of contribution ($r = .446$). This implied that learners with higher English proficiency levels would produce significantly more text than those with lower language proficiency while performing a CW task. Based on the findings of linear regression analysis, learners' English language proficiency could predict 17.4% of their proportion of contribution. On the other hand, learners with lower language proficiency demonstrated low engagement that resulted in a low percentage of contribution. The two following excerpts are samples that reflect English language proficiency level on their contribution towards CW tasks.

"...Although I did not write a lot because my vocabulary in English is limit and my English writing skills are still basic, but I shared my ideas as I can to my team when we write together..." (ST16 – Student Reflection)

"...I feel bad when DocuViz shows the graph that I wrote very little. I must accept that because my partner who is also a leader in the group can write well. My English level is not good so when I write I also afraid of mistakes and my grammar..." (ST23 – Student Reflection)

To conclude, the nature and magnitude of learning in CW activities that shaped interaction patterns and CW styles are partially mediated by learners' language proficiency level. Learners with low English proficiency level when paired up with peers who are better in English tended to orchestrate disproportional relationships, such as expert/novice or dominant/passive (Storch & Aldosari, 2013; Zhao, 2018) which resulted in unbalanced contribution, in that the lower proficiency learners produced shorter texts.

6.2.3 Individual Roles in CW

Individual members in the group played a significant role in shaping interaction patterns and collaborative styles, which drove to successful collaboration. A successful team is comprised of members with apparent roles and responsibilities. Collaboration became more effective and engaging when the group experienced emergent leadership, which can be either dominant/passive or expert/novice, or even democratic (building

relationship) (Kukulska-Hulme, 2004). The findings from the present study informed us that an effective group needs a leader who can motivate the team to fulfill the group goals and accomplish tasks in a timely manner. The team with a task-oriented leader without focusing on relationships would likely be concerned with task completion and ignore social emotions, so the group interaction pattern tended to be more on dominant/passive or dominant/dominant, or member withdrawal, resulting in low mutual interaction. On the other hand, the team with a relationship-focused leader would likely exhibit expert/novice interaction patterns since the leader of this type would support the members, care about member satisfaction, and thus maintain good relationships (Elabdali & Arnold, 2020; Li & Kim, 2016; Storch 2013, 2021; Teng, 2021). Subsequently, the member interaction is mutually high and positive although the contribution of text may not be balanced.

Additionally, the study revealed there were small groups whose member roles were obscure. When the position of the group members was unclear, it would affect communication negatively and lead to team conflict (Cao, 2014; Storch, 2021; Wang et al., 2017), which would result in member withdrawal. This scenario likely occurred to members with low language proficiency who did not receive scaffolding from more able partners. This resulted in less successful group performance, or collaborative work turned out to be a group-single author (Lowry et. al., 2004) or non-collaboration, as seen from Groups 4 and 6 in the present study. For this reason, individual roles must be designated apparently based on members' strength and preference. The team must value social-relationship and inter-dependence while being involved in a collaborative task (Dobao, 2020; Lee et al., 2019; Saeed & Ghazali, 2017) and designate a clear role to each member to share resources, collaborate in knowledge construction (Elabdali, 2021; Hsu, 2020), and achieve the group goals. The triangulated data sources from the interviews and students' reflections indicated that members who established their fixed role as leader would serve as text editor and proofreader that propelled them to claim writing space. On the contrary, members whose roles were novice writer, reasonable contributors, or followers would

likely play a subservient role in text contribution. The two following excerpts are samples that reflect individual roles on their contribution towards CW tasks.

“...as for me I have to make sure our essay is cohesive and in line with the thesis statement with adequate support, so I took responsibility to control the essay and proofread the text before sending to the teacher for grading...” (Interview with ST7 from Group 9, Dec 11, 2020)

“...in my group, someone took control of the work but I was not told properly which part I need to help because someone is worried too much about points. I could only do very little because our responsibility is not assigned clearly...” (ST27 – Student Reflection)

To sum up, the findings from the present study disclosed that a successful CW team needs a leader who can motivate, support, and encourage the members to get involved in the task with a stress-free learning atmosphere, and stimulate individuals to give efforts. Each member needs to have a clearly defined role and responsibility to execute in an effective way and enhance positive interactions. A team whose members' roles are unspecified may fail to interact and are lacking accountability (Storch, 2021; Zhao, 2018). Therefore, members' roles in a collaborative task guided by group leaders inevitably influence interaction patterns and CW styles, which lead to successful collaboration.

6.2.4 Topic Familiarity

The researcher suggested four topics for each essay type; however, learners could generate their topic with approval from the researcher. The shortlisted topics on the descriptive essay were such as (1) food in the university canteen, (2) the university landmarks, (3) a dormitory life, and (4) a remarkable place to visit. Likewise, four shortlisted topics on the argumentative essay were such as (1) the importance of college education, (2) imposing curfews at the university, (3) college students and part-time jobs, and (4) college students should spend more time in class than getting involved in non-academic activities. Each group chose one of the topics for each essay. The four optional topics for each essay type were given to offer learners choice on familiar topics in anticipation of seeing them producing richer data.

From the triangulated data sources including the interviews and reflections, the participants noted that their familiarity with the essay topic improved their interaction rates and stimulated them to negotiate on task more spontaneously. The type of essay topic perceived to be a mediating factor that influenced members interaction and writing product in small groups (Dong & Liu, 2020; Li, 2014). As advocated by Cho (2017), topic familiarity or task representation is a crucial aspect in CW that shapes the patterns of group interaction. Writing tasks with a familiar topic made it easier for learners to express ideas (Olson et al., 2017; Shakourzadeh & Izadpanah, 2020; Yuli & Halimi, 2020) while producing a CW task. The type of task or an essay topic that is unfamiliar to group members would affect their interaction patterns (Hsu, 2020; Yim et al., 2017), in that members might abstain from sharing their views due to the lack of linguistic resources and information. On the contrary, the participants claimed that topic familiarity would enable them to formulate ideas, pool linguistic resources, start negotiating on task, and attempt to build knowledge together. Such findings were congruent with Dong and Liu (2020) whose study reported that topic familiarity could increase students' interaction, their willingness to engage in the conversation, and peer scaffolding. Learners engaging in collaborative discussion on a familiar topic recognize the value of language as a reasoning tool (Cao, 2014; Gillies, 2019) that could enhance their cognitive ability and social competence. The two following excerpts are samples that reflect how familiar topics influence learner contributions.

"...Our group divided work almost equally since we all agreed with the topic and every one knows the landmarks of the university, so each member wrote about one landmark incorporating descriptive details. Then we helped one another in the conclusion..."
(Interview with ST15 from Group 1, Dec 4, 2020)

"...I have to confess that I could not contribute much although I was assigned to write the introduction and concluding paragraphs. I did not read much, so my partners had to revise my part a lot..." (ST16 – Student Reflection)

Therefore, to assign learners to construct a collaborative essay, the instructor needs to propose familiar topics or topics of interest that learners have some background knowledge about them. The group needs to agree on the topic and ensure each member

has adequate information to contribute to their full potential. When learners work on a familiar topic or topic of their interest, they can participate more actively and take responsibility for the section that has been assigned to them more zealously as well as for their own learning progress. We may conclude that the patterns of interaction and CW styles are influenced by distinct factors, which can be drawn and summarized in Figure 6.2.

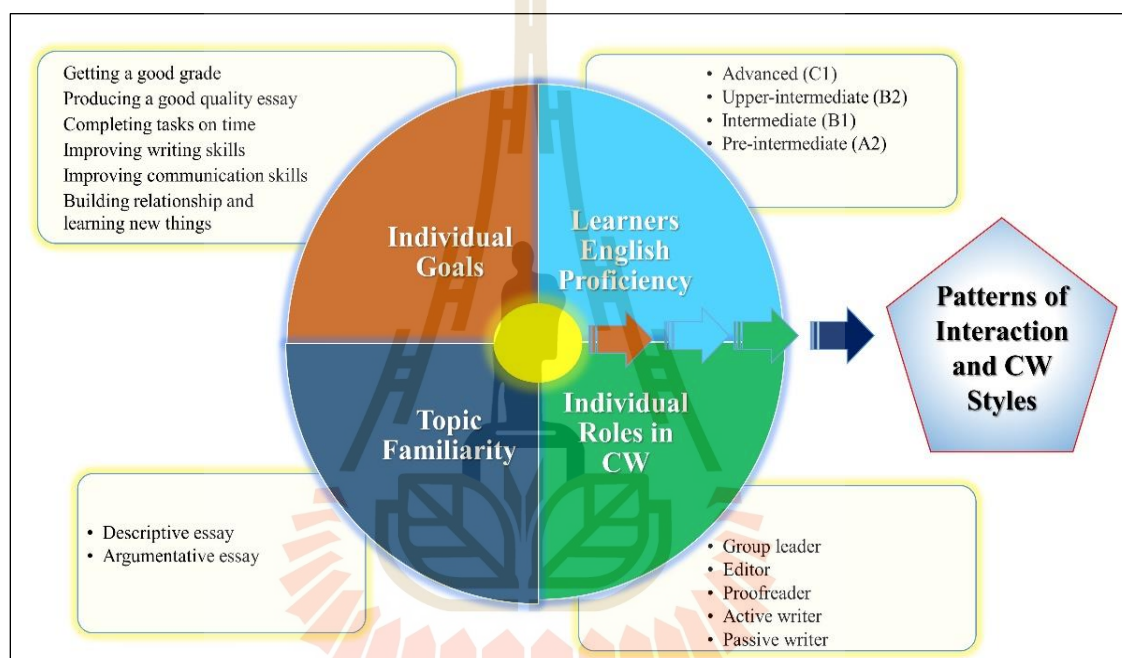


Figure 6.2 Factors Influencing Patterns of Interaction and CW Styles

As described in Figure 6.2, four distinct factors: individual goals, learners' English proficiency, individual roles, and topic familiarity, remarkably influence interaction patterns and CW styles. These factors helped explain why each small group exhibited such patterns of interaction and CW styles while engaging in group work. The following subsection discusses the findings of WCFs and LFs employed by learners in small groups.

6.3 Learners' Use of WCFs and LFs in CW tasks

Writing change functions (WCFs) and language functions (LFs) were analyzed from GD archives where learners co-constructed their essays. These LFs reflected how learners employed the language as a mediating tool to communicate and interact with peers over group work. Additionally, WCFs mirrored how learners in small groups collaborated while engaging in text construction (Hsu, 2020; Li, 2014; Li & Kim, 2016; Li & Zhu, 2017; Wang 2019). From the findings, the participants employed varied WCFs, in which the most WCFs frequently used were adding, accounted for 38%, followed by correcting (21%), and deleting and rephrasing (17% each), whereas reordering was sparingly used (7%). The use of WCFs influences the amount of text contributed to the writing product, which helped identify equality (percentage of text contributed to the writing piece) (Li & Kim, 2016; Storch 2013, Wang 2019). Learners' employment of WCFs had a strong positive correlation with text contribution and moderate positive correlation with their subsequently individual writing performance. In other words, the more frequent used of WCFs, the higher percentage of written text a writer contributed, which consequently yielded a positive impact on individual writing development. From a linear regression equation, WCFs used could predict 15.2% of learners writing performance scores. This indicated that a good writing product goes through a recursive process, which written texts need adding, correcting, revising, reorganizing, or restructuring of ideas. As advocated by Wingate and Harper (2021) and Chen (2019), writers that are more successful would allocate more time on global planning, composing and reviewing processes. The constant practice of the recursive writing act, in the long term, improves writing performance (Qiu & Lee, 2020; Zhang & Plonsky, 2020). Thus, writing instructors need to encourage learners to revisit their writing to improve content and rhetorical structure in specific contexts. The instructors can promote a recursive writing process through collaboration (Huang & Zhang, 2020) that allows learners to work together, generate ideas, compose and revise multiple drafts collectively. Through this interactive process, learners could negotiate by employing varied LFs to interact and generate more linguistic input opportunities, which would lead to collective knowledge construction.

The use of LFs permits learners to be fully engaged in the task. The initiating acts, such as stating and suggesting, were the two language acts most frequently used by learners (accounted for 20 % each), whereas justifying and disagreeing were the least used LFs (1% each). The employment of LFs mirrored how learners in small groups interacted and negotiated on task. The ratio of initiating acts that received responses indicates high level of mutual engagement. On the other hand, the initiating acts that received low responses or no response infers members lacking mutual engagement or interaction with their peer contributions. The present study revealed that LFs are positively correlated with text contribution and individual post-test writing. From a linear regression analysis, LFs used could explain 17.4% of learners writing performance scores. Furthermore, the percentage of LFs used by learners is strongly correlated with their use of WCFs. This phenomenon explained that learners who employed more LFs on task negotiation and interaction while performing a CW task likely contributed more written text in the final draft. Additionally, by actively engaging in their group work, learners scaffolded each other, shared linguistic resources, so they learned to construct knowledge together. The statements from ST4 and ST14 reflections supported this claim,

“...in the group I might be the least competent writer but I am not afraid to write or share opinions because my friends are helpful and edit my sentences when I make mistakes on grammar and tenses...” (ST4 - Reflection)

“...I have a supportive leader who knows more English than me and she is willing to help. I feel comfortable to work with her and I can learn in this way...” (ST14 - Reflection)

Such collective learning experience and peer scaffolding would be applied and internalized for future writing (Bhowmilk et al., 2018; Chen, 2019; Hsu, 2020; McDonough et al., 2018; Qiu & Lee, 2020; Zhang & Plonsky, 2020), as evident by their improved scores on individual post-test writing.

We may conclude that WCFs and LFs play a crucial role in propelling the team to write through a recursive process to complete their CW tasks and achieve common goals. The varied use of WCFs and LFs provide opportunities for learners to negotiate on tasks,

share resources, scaffold members with lower writing competence concerning language-related issues, exchange information to construct knowledge that can be internalized in the individual writing practice. Therefore, a writing instructor in a CW classroom needs to instill learners and demonstrate how WCFs and LFs can be used effectively in the writing process to improve the quality of a co-authored paper. The following section discusses learners' perceptions of WBCW in GD to address Research Question 4.

6.4 Learners' Perceptions of WBCW in GD

Overall, learners showed high levels of perceptions toward GD; in other words, they had positive perceptions about this cloud-based writing tool. The results from qualitative content analysis revealed various reasons learners held positive perceptions, as well as some negative ones.

6.4.1 Positive Perceptions towards GD

Positive perceptions were related to the advantages of GD for collaboration. Themes emerged from content analysis concerning learners' perceived usefulness of Google Docs include (1) a convenient tool for collaboration, (2) a blended learning and communication platform, and (3) a useful tool for monitoring collaborator's engagement.

1) A convenient tool for collaboration

GD was noted for its convenience of use. Group members did not need to meet in person but worked at convenient times regardless of locations. This finding confirmed previous studies, which reported the convenience of use of GD for collaboration (see Andrew, 2019; Jeong, 2016; Suwantarathip & Wichadee, 2014; Woodrich & Fan, 2017). The post-task questionnaire item 1 supported this finding, that 94% of the participants perceived GD a useful tool for collaboration. The tool allows learners to perform group tasks without restrictions often inflicted by traditional classrooms when members need to meet in person to complete group tasks (Alharbi, 2020; Bhowlik et al., 2018; Krishnan et al., 2018; Steinberger, 2017). During the time when the study was conducted, 16 students (45.7%) joined the course online due to the COVID-19 pandemic. GD was used to aid small

group collaboration across boundaries in that learners could work collaboratively on the same file synchronously or asynchronously. Learners applauded the tool for its autosave feature (Lamont, 2015; Steinberger, 2017), and the cloud-based writing tool assisted them to accomplish group tasks on time. This was because GD has similar toolbars like word processors that all students were familiar with.

2) A blended learning and communication platform

Google Docs permits learners to communicate both in synchronous or asynchronous modes. Learners can perform live chats and update their writing on the cloud-based platform, or they can leave comments if they prefer working outside class hours. Learners perceived writing via GD facilitated their collaborative tasks as members interacted with one another online. This similar finding was also discussed in previous studies (see Andrew, 2019; Berdun et al., 2018; Borowski et al., 2020; Cho, 2017; Steinberger, 2017). Learners complimented the tool for easing their interactive communication and supporting their CW process as they composed texts in their GD word processor, shared a vast array of ideas and linguistic resources despite working in different locations. This similar finding was also reported in Ahmad's (2020) and Bakir et al.'s (2020) studies. These researchers found that online students could improve communication skills and quality of essay writing as well as enhance group collaboration when they performed tasks and shared resources with one another in GD. Learners in the present study acknowledged that they could interact by using this cloud-based writing platform. A similar finding was mentioned in Yim's (2017) and Neumann and Kopcha's (2019) studies, in which these researchers posited that collaborating in GD enhanced social skills and interactions when peers provided positive feedback and had threaded real-time discussion. The cloud-based writing platform permitted individual members to exchange ideas with the group and receive feedback. This could further improve communication skills.

3) A useful tool for monitoring collaborator's engagement.

Learners discerned that GD was a web-based word processor that provided a shared space. Collaborators can exchange resourceful information and enhance knowledge collectively. The tool kept all records of track changes in the history revision

in that the group leader or instructor could monitor which member was active or inactive, or who slacked off from the group during the collaboration process. The post-task questionnaire item 4 revealed 88.5% of the participants expressed that they could contribute to their group when they used GD. This was because they were aware that their contributions were visible (Krishnan et al., 2018; Steinberger, 2017; Warschauer et al., 2019). Learners realized their involvement with peers in the web-based writing platform cultivated a sense of belonging to the group either providing support or receiving assistance from partners (Hsu, 2020). Furthermore, they recognized that their visible records of participation would permit the course instructor to make impartial evaluation on individual performance. This is a remarkable advantage of using GD over the conventional writing class when member contribution in CW was invisible. Through GD, individual member's contribution and engagement with the team were made visible.

6.4.2 Negative Perceptions towards GD

Despite the positive perceptions, learners perceived some drawbacks about GD. It was viewed as an internet-based tool in which real-time collaboration could be operated smoothly with stable internet connection. The collaboration process became frustrating when the internet connection failed. Although a document collaborated via GD can be edited offline and synced once the wi-fi is reconnected, learners reported having unsuccessful attempts, as the installation on a desktop computer, laptop, or tablet requires some IT skills. This finding was also congruent with Lee and Hassell's (2021) study, which revealed that the most common disadvantage of using GD was the internet connectivity issue. Lamont (2015) posited that despite the availability of offline access to GD, a user needs a few steps to ensure the application runs successfully.

Aside from network dependability, learners expressed their concern that using GD may violate the privacy of individual writers who shared information on cloud. This similar finding was discussed in previous studies (see Nakayama & Chen, 2019; Steinberger, 2017). The researchers claimed that GD is a functional and useful cloud application, but its privacy concern and security risk should be treated with caution. Learners' texts can be manipulated or changed arbitrarily. This made learners reluctant to type in texts when

all group members worked synchronously. This happened more frequently to less capable learners or learners with lower language proficiency when they were observed by their more able partners. Learners' perception of instructor or peer monitoring over their contributions while performing CW on a cloud-based writing tool was also discussed in Steinberger's (2017) study. The researcher argued about ethical concerns that the shared documents would cause learners with less language proficiency to feel pressured and uncomfortable to type texts when they were observed. In response to this concern, the researcher acknowledged that learners in small groups came from varied cultural backgrounds and they were new to a college experience; furthermore, they were unfamiliar with CW in GD when any member in the team could watch their real-time performance on the shared screen. Therefore, building a sense of belonging, fostering cohesion among the group members by using team-building exercises, supporting them to overcome cultural differences, and cultivating their concept of sharing openly to achieve a greater goal are crucial elements for a course instructor to implement in the CW classroom. Notwithstanding, learners collaborating on the web-based writing tool should be provided ample time to participate asynchronously if they feel uncomfortable working in real time (Abe, 2020; Borowski et al., 2020). The following section discusses learners' perceived advantages of CW.

6.4.3 Learners' Perceived Advantages of CW

Based on the content analysis taken from the triangulation of data from various sources including post-task questionnaire, student reflections, and semi-structured interviews that can verify the internal validity of qualitative data (Creswell & Creswell, 2017), five emerging themes derived from the analysis that was presented in Chapter 4. The major advantages of WBCW were (1) accelerating the work process, (2) generating a variety of ideas, (3) improving the quality of writing, (4) enhancing communication skills, and (5) learning about different cultures.

1) Accelerating the work process

WBCW was perceived to escalate the work process when a clear objective is set. Individual member's responsibility, strength, and area of expertise must be clarified

to smoothen the workflow and achieve the group goals in a timely manner (Ahmad, 2020; Caplan & Farling, 2017; Li & Storch, 2017; Teng, 2021). In the study, learners were instructed to jointly construct a five-paragraph essay on description and argumentation. They learned to provide adequate information for each supporting paragraph. Learners were found to divide up the task to alleviate writing workloads since academic writing was a new course for learners who were just starting a university program. Thus, writing to incorporate extensive information could be done faster when learners performed the task collectively. Learners collaborated via GD commented or received feedback from peers, and corrected each other's writing in a quick manner.

2) Generating a variety of ideas

WBCW could empower learners in small groups to generate more creative ideas. Writing together in small groups stimulated introverted learners who may feel depressed when they were short of ideas while performing a challenging task in time constraints (Ahmad, 2020; Bikowki & Vithanage, 2016). When more perspectives were exchanged and discussed with a clear purpose, the team would produce a better quality of work, and the members could enhance their mental efforts. Such similar findings were also reported in Abe's (2020) and Wang et al. (2020) studies. These researchers asserted that when ideas and materials are exchanged among the members while engaging in a collaborative task, the team could process the information more thoroughly and consequently benefit individual member's cognitive processing, working memory, and decision making. Thus, WBCW permits learners opportunities to harness brainpower, generate more perspectives, and stimulate mental functions to be more logical, critical, and analytical, which are essential for writers who aim to hone their academic writing skills.

3) Improving the quality of writing

WBCW could improve learners' writing skills as they interacted with each other while attempting the task. They shared useful linguistic resources including expressions, syntax, and language register, which contributed to the overall quality of writing. This similar finding was congruent with previous studies (see Abahussain, 2020;

Andrew, 2019; Bailey & Judd, 2018; Bhowmik et al., 2018; Hsu, 2020; Teng, 2021). Learners perceived WBCW could improve their vocabulary, content, structure, and organization as they exchanged perspectives, rendered comments and feedback on each other's work. The benefits of knowledge gained from CW tasks concerning language related issues made it possible for learners with lower proficiency, which otherwise would have hindered their opportunity to strive to reach a higher level. Such finding was noted in Anggraini, Rozimela, & Anwar's (2020) study. The researchers found that CW helped EFL learners to improve their use of language in expressing ideas, choosing appropriate words and sentence structures, which resulted in a better quality of writing.

4) Enhancing communication skills

Learners acknowledged that CW activities promote communication skills, peer interaction, and cognitive processes. Along the CW process, learners in small groups were challenged to communicate ideas, exchange thoughts using both written and oral communication skills. These claims are in line with previous studies (e.g., Ahmad, 2020; Bakir et al., 2020; Coffin, 2020; Nykopp et al., 2019) who found that CW tasks or teamwork enhanced students' critical thinking and communication skills. The findings can be explained by Vygotsky's sociocultural theory, which argues that the internalization of knowledge occurs when learners interact positively with one another in a social context (Mahan, 2020; Poehner & Infante, 2019). With the assistance rendered by peers that are more knowledgeable to less able partners in their interactive conversations, the assisted individuals can rise to their ZPD.

5) Learning about different cultures

WBCW in a multicultural EFL classroom gave students opportunities to learn about cultural differences, values, and beliefs individual holds, in that they could work in harmony and reach mutual understanding when they encountered cultural conflicts. Furthermore, due to the growing number of international schools nationwide, multilingual learners are getting more common in an EFL classroom today (Conteh, 2019; Rowe, 2019; Sun & Zhang, 2020; Unsal et al., 2018). Thus, learners from diverse cultural backgrounds in a language classroom setting working together in small groups could develop inter-

cultural communication skills (Gallagher, 2020), build trust and relationships with partners, become more open-minded, and receptive to new perspectives as they interact and negotiate with each other using a target language (Sitthitikul & Prapinwong, 2020). Learners perceived that when they worked with peers from various cultures, they could share different perspectives, which facilitated their learning continuum. Therefore, training EFL learners to work collaboratively in a multilingual classroom context will prepare them for future careers in a multicultural world.

6.4.4 Learners' Perceived Disadvantages of CW

Although learners perceived some advantages of CW that could improve their academic writing and communication skills or provide them opportunities to learn about different cultures, learners did report some disadvantages of working in a group, such as conflicts of ideas, unbalanced workload, time consumption, and incoherent writing. Admittedly, teamwork did not go as smoothly as predicted when varied ideas were debated among overconfident members. Moreover, when those disputed ideas were not resolved, the member simply withdrew from the group or discontinued interacting with other group members and that would deteriorate the group's productivity (Wang & Tan, 2017). The teams whose members showed failure interaction or dominant and passive interaction patterns echoed this concept.

Learners perceived CW created disparity of workloads in which more responsibility was imposed on a more capable peer. This claim was discussed in Ghufron and Ermawati's (2018) study. The researchers claimed that inactive participation of members added workload and more preparation on the group leader. This might be because the group leader needed to delegate tasks to members, monitor the progress of work, and ensure that tasks were submitted in a timely manner. However, when particular members failed to accomplish their parts within the deadline, the leader with higher skills would intercede (Kim, Lee, & Wang, 2020) and this resulted in the unbalanced workload and added burden on the team leader.

Additionally, learners discerned that group work could be time-consuming when the team tried to incorporate various concepts from individual member during the

preliminary stage to sustain a relationship, or when the team wanted to co-ordinate with every member's convenient schedule. From the interviews and student reflections, learners voiced that time-consuming derived from two main factors: schedule conflict due to different study hours and thoughtless members who were not punctual in contributing their parts on time. From this finding, the researcher would suggest that making a CW task function smoothly, the group members need to define a clear-cut goal and each member must be responsible for the assignment and constantly assess each other's work progress. Furthermore, a successful CW team needs a good leader who can communicate effectively and coordinate actions as well as support the team members that need assistance (Hosseini, Bavali, & Rezvani, 2020).

Learners marked that when the group members did not communicate properly with one another while engaging in the task, but rather focused on their own section, the compiled work from individual contribution to the final draft could be just a chunk that lack cohesion and connection between ideas. The writing had no unification if those compiled texts were not revised. This phenomenon was sighted when the members lacked mutuality (not engaging with peers' texts or failing to employ LFs to negotiate with each other), or when members lacked intersubjectivity – refrained from sharing knowledge or understanding with each other (Li & Zhu, 2017). Therefore, members' collaborative endeavours and active communication are crucial elements to make the writing stronger and more accurate. We must acknowledge that consistency in academic writing is vital as it creates a good impression of the overall quality of writing.

Although the present study revealed the benefits of CW in a composition classroom where culturally diverse learners worked together in small groups, there were drawback experiences expressed by learners who perceived individual writing would allow them to express themselves and explore ideas freely and plan all writing stages independently without having to wait for someone's labour. Such claims articulated by learners in the present study concerning unpleasant experiences was also reported in Savasci and Kaygisiz's (2019) study that EFL learners who were exposed to pair and group writing for one semester still preferred self-directed writing over small group writing or pair

work as they could organize time at their convenience, monitor their self-improvement, and develop their own learning strategies. The unresponsive teammate could add extra workload and stress on the group leader at the final stage when work needs to be accomplished in a restricted time frame, or low achievers turned out to be free-riders (Lewis, 2010). In CW tasks, the fairness problem becomes notorious when more highly motivated learners are grouped with unmotivated partners, but the outcomes of the final product are rewarded to every member. Therefore, at the final project, members should be given the opportunity to evaluate the project and have them assess their CW procedures and grade their teammates' performance or contribution fairly. This could reduce the impartiality problem; otherwise, instead of promoting collaboration, learners may remark, "*some only wait to enjoy the fruits of other people's labor*". (ST16), or "*my partners did little on the last day. This gave me a bad experience of group work.*" (ST25).

We may conclude that although CW activities implemented in the present study yielded positive results on individual's writing performance, not all learners perceived CW pleasant experiences or enjoyable as they had to deal with conflicts of ideas, unequal participation of teammates, time consumption, and incoherent writing. Therefore, CW studies in a multilingual English language classroom context need further exploration to evaluate their long-term impacts.

6.5 Multilingual English Learners and CW Tasks

The participants in the present study were L2 learners from nine different countries in Asia (see 3.3 in Chapter 3). They were all new to college education. Besides, during the time of data collection, 45.7% or 16 of them resided in their home countries taking the course online because of the COVID-19 pandemic situation. When they were formed in small groups of three or four members, they were reluctant to collaborate for they had never participated in any cross-cultural collaborative project in high school. Previous researchers (e.g., Chua, Morris, & Mor, 2012, Marshall & Marr, 2018; Lewis, 2010; Wilson & Soblo, 2020) claimed that sharing of insights or exchanging of ideas in a conversation with an interlocutor from a different cultural background entails putting oneself susceptible to

the other, and that requires trust, confidence and self-efficacy. A cross-cultural collaboration would not likely occur spontaneously, unless a member with intercultural orientation takes initiative to lead the team (Chua et al., 2012; Lewis, 2010), or by teacher endeavour and intervention. The researcher learned from the pilot study that letting members perform a CW task at a natural setting without providing intercession or giving feedback would lead to member low engagement or disengagement. Therefore, in the present study the researcher provided indirect feedback on their writing (i.e., encouraging members to participate in the writing and identifying errors for them to amend) but not explicitly intervened in their CW efforts. Additionally, each collaborative essay carried 5% of their final grade.

Although the participants received constant reminders to engage in group work, two out of eleven groups (Groups 4 and 6) failed to interact across tasks. This infers that to some learners, writing is a private matter in that they feel uncustomary to work with someone unknown (Wang, et al., 2017) despite receiving constant reminders from the instructor. As advocated by Lewis (2010), learners from culturally diverse backgrounds would unlikely interact with other international partners unless they are encouraged to participate in team building activities and get familiar with each other first. Other factors affecting learners' collaborative or non-collaborative behaviours include individual goals, English language proficiency, individual roles, and topic familiarity (see 6.2).

Learners' diverse goals in CW shaped their collaborative behaviours. Those who aimed to earn a good grade produce a good quality essay, and complete tasks on time were the ones with higher levels of language proficiency or had a strong background in English. In other words, they perceived the good results from hard work were the consequence of their efforts and language background, which led them to accomplish their goals. These learners would direct the team in collaborative efforts for they have distinct advantages over their less capable partners concerning linguistic resources and language ability. They would take up leadership roles either desired or imposed across tasks. In the study, learners from countries such as India, the Philippines, and Malaysia, had a higher level of language ability compared to their peers from other Southeast Asian

countries including Cambodia, Myanmar, Thailand, and Vietnam. This has shown that the *EF English Proficiency Index* (2020) report was in that the English language proficiency level of EFL learners in Southeast Asian countries varied greatly. From this scenario, learners from countries ranked as high in the English Proficiency Index were more confident to lead their team in collaboration due to their advantage of language ability (Dong & Liu, 2020; Hsiu-Chen, 2019). On the other hand, learners with lower language proficiency level contributed less for fear of making errors and lacking self-efficacy (Zhang, 2019). These learners held distinctive goals such as developing writing and improving communication skills. These less-able learners played a subservient role by observing and learning from peers with higher achievement and learned to produce better sentences through peer scaffolding. These learners with limited language proficiency marked that their English writing skills were influenced by their L1 grammatical interference, particularly the differences in syntactic structure, grammatical units, word order, or verb conjugations. A few of these learners composed texts in their L1 prior to translating them into English text. In other words, they formulated ideas using L1 and transcribed them into English later. A few learners employed free translation applications online to assist their writing in the target language. This scenario implies that less competent L2 learners would employ their linguistic repertoire from L1 to assist them in generating ideas or concepts and formulating texts prior to writing them down in the target language. This similar writing strategy was also reported in Gunnarsson's (2019) study that the Bosnian and Macedonian students used their heritage languages to support their L2 English essays. Nonetheless, when L2 learners' language proficiency increases, their L1 use would subsequently decrease. This incident was observed from the interviews with the selected group members who were exposed to English at their young age. These high proficiency learners were observed to produce more appropriate lexical choices in relation to their writing tasks since they have acquired language fluency. Such similar findings were also discussed in previous studies (see Cenoz, 2003; Gunnarsson, 2019; Tullock & Fernandez-Villanueva, 2013).

However, through collaborative efforts learners exhibited in the current study, they could learn from more capable peers and subsequently produced better texts in the post-

test writing (Chen, 2019; Dobao, 2014; Latifi et al., 2021). As advocated by Lantolf and Thorne (2007), learners' cognitive function would process what was being procured for future performance when the mental process was stimulated. This phenomenon infers that an instructor in a multilingual CW classroom needs to create learning opportunities and encourage diverse learners to embrace cultural differences represented in the classroom. Furthermore, learners' divergent cultural orientation must be embraced and treated as assets not as hindrances (Kantisa & Sitthitikul, 2018). This could dispel any negative stereotypes, but rather show mutual respect in that they can join in knowledge creation by making use of various learning strategies. In an international university context, a growing diversity in language classrooms with multilingual learners is common. A language classroom may include a handful of learners with cultural and linguistic diversity. The course instructor ought to compel high-skilled learners to exercise their language asset and assist their peers with less competence. By doing so, knowledge can be extended and internalized in a win-win scenario as an axiom echo "the more you give, the more blessing you will receive". Moreover, raising cultural awareness, organizing intercultural communication workshops, and showing cultural empathy with one another in a multilingual EFL classroom would give learners an understanding of how individual culture informs their beliefs and values, so they could learn to avoid potential conflicts (Hansen-Thomas & Chennapragada, 2018). In this way, diverse learners can learn from one another in harmony when they are educated to embrace values and cherish cultural diversity. They can expand friendship boundaries in a positive classroom environment where new knowledge can be enriched and shared.

To conclude, multilingual classrooms where English is taught as a medium of instruction are expanding rapidly due to the mushrooming of international institutions. A classroom instructor of a multilingual EFL classroom should promote collaboration across cultures and raise learners' awareness by instilling distinctive cultural values, differences, and developing inter-cultural communication skills as they interact with each other using a target language – English in this context. Training learners to work collectively by

integrating online collaborative tools such as GD in the language classroom would guide them for career prospects in a multicultural world where English is used as a lingual franca.

In summary, this chapter discussed learners' improved writing performance in producing argumentative essays after engaging in the CW tasks. Their increase of mean scores in all language domains including content, organization, vocabulary, language use, and mechanics, has proven the positive effects of WBCW activities. Next, it described patterns of interaction and small group CW styles. The qualitative data analysis revealed that four major factors influencing small group interaction patterns and CW styles: individual goals, learners' English proficiency, individual roles in CW, and topic familiarity. The chapter also presented the WCFs and LFs produced by each group. Furthermore, it discussed learners' perceptions of WBCW in GD using qualitative content analysis. Lastly, the chapter reflected multilingual English learners and CW tasks in writing classroom contexts. The next chapter concluded the present study and further provided implications and recommendations for further research.



CHAPTER 7

CONCLUSIONS AND IMPLICATIONS

This chapter presents the conclusions and implications of the study. Firstly, it summarized the major findings of the study, and then provided implications for writing instructors in multilingual EFL classroom contexts in enhancing CW activities by employing a web-based writing tool to facilitate online collaboration. Secondly, the chapter discussed the theoretical and pedagogical implications. Next, it addressed some limitations and proposed recommendations for future research directions to enrich a sociocultural perspective in supporting cross-cultural collaborative writing. Finally, it ended with a summary of the chapter.

7.1 Summary of the Major Findings

The study was proposed and conducted for enriching the existing literature on a sociocultural perspective, particularly the effects of CW in a multilingual EFL classroom and small group interaction in GD. The pre-test and post-test essay topic was adopted from the 2019 International English Language Testing System (IELTS) practice essay questions. Jacob et al.'s (1981) Composition Analytic Scoring Rubric was deployed to evaluate the learners' pre-test and post-test writing performance. The researcher developed two CW lesson plans consisting of description and argumentation. Two main textbooks by Folse & Pugh (2019) and Langan & Albright (2019) guided the researcher in constructing the two lesson plans. The lesson plans were developed based on sociocultural theory, which posits that social interaction and collaboration empower learners to improve knowledge acquisition (Vygotsky, 1978; Lantolf, 2003; Lantolf & Thorne, 2007; Ngo, 2018), and share linguistic resources (Alghasab et al., 2019; Chen, 2019; Dobao, 2014; Latifi et al., 2021; McDonough et al., 2019). The work of Li (2014), Li and Kim (2016), Li and Zhu (2017), and Storch (2002) was used as a guide to investigate small group

interaction patterns. DocuViz was employed to analyze small group CW styles across CW tasks. The researcher modified a five-point Likert scale questionnaire items from Li (2014) to explore learners' perceptions of WBCW experiences. A mixed methods approach was used to collect both quantitative and qualitative data. A quantitative methodology was employed to assess the learners' improved writing performance after engaging in CW tasks, investigate the frequency distributions of WCFs and LFs, and percentage of text contributions, as well as explore learners' perceptions towards WBCW by using descriptive statistics. Additionally, a qualitative method was deployed to triangulate qualitative data sources including interviews, the open-ended questions from a survey questionnaire, and student reflections by using content analysis.

The major findings of the present study were summarized based on the research questions as follows.

RQ1. Do collaborative writing tasks help to improve learners' writing performance in an argumentative essay? If so, how?

This study revealed that CW tasks have salutary effects on multilingual EFL learners' writing performance when they constructed argumentative essays on an individual level. Learners showed writing gains for each language domain that includes content, organization, vocabulary, language uses, and mechanics. The findings could further substantiate the effectiveness of CW by previous studies (e.g., Alghasab et al., 2019; Bhowmik et al., 2018; Caplan & Farling, 2017; Chen, 2019; Coffin, 2020; Dobao, 2014; Dong & Liu, 2020; Latifi et al., 2021; McDonough & De Vleeschauwer, 2019) which reported that CW activities enhanced writing skills. The results of the study showed learners improved on greater control of writing conventions, such as producing more outstanding thesis statement, using solid reasoning to evince argument and refutation, producing more extended texts, longer sentences and more complex sentence structures. The findings of the study confirmed the reports of previous studies (see Chen, 2019; Krishnan et al., 2018; McDonough et al., 2018; Qiu & Lee, 2020) which claimed that essays composed collaboratively were longer and contained more clauses, which made sentence structures

more complex. The experiences of involvement in CW tasks compelled learners to internalize accumulated knowledge into their ensuing writing performance (Lantolf and Thorne, 2007).

RQ2. What patterns of interaction occur when learners engage in collaborative writing tasks via Google Docs?

The study revealed that learners in small groups produced dynamic interaction patterns consisting of seven distinctive types. The seven types include collaborative (members made nearly equal contribution of texts and engaged with peers' texts); cooperating in parallel (members contributed their parts but seldom engaged with peers' texts); dominant and passive (one member dominated the work and other peers contributed minimally); dominant and defensive (members tried to control the task and ignored peers' comments); expert and novice (one member took control of the work, but scaffolded other peers' texts); active and withdrawn (members contributed at the initial stage but withdrew from the group later); and failure interaction (members failed to engage in group task). Of these seven interaction patterns, three types (active and withdrawn, cooperating in parallel, and dominant and defensive) were also reported in Li's (2014), Li and Kim's (2016), and Li and Zhu's (2017) studies. The other three interaction patterns (collaborative, dominant and passive, and expert and novice) were congruent with Storch's (2002, 2005, and 2011) earlier studies, and these interaction patterns reaffirmed Storch's model of dyadic interaction in cross-cultural collaboration. However, a failure interaction or non-interaction type occurred although members were compelled by the instructor overtime during their CW process. This has proven that collaborative efforts would unlikely occur among learners who perceive writing as private matters and hold tight to this notion.

From the bottom-up grounded analysis of DocuViz (Yim et al., 2017), five CW styles were observed from the present study. They are collaborative style (members made joint contribution in text construction); cooperative style (member divided up the workload and occasionally engaged with others' texts); divide and conquer (members divided task

without engaging with other's texts, and compiled work in the final stage as block type); main writer style (one or two members composed more texts and controlled the task); and non-collaborative style (one or two members failed to participate in the group work). Of these five CW styles, three of them including cooperative, divide and conquer, and main writer styles, were earlier reported in Yim et al.'s (2017) study whose research explored the different styles of synchronous collaboration among college students who jointly produced texts in GD. However, the current study found two additional types of CW styles: collaborative and non-collaborative styles. This might be due to the divergence of collaborative work, which permitted learners to work either synchronously or asynchronously in GD while performing their group tasks. Furthermore, the qualitative data sources from the interviews, open-ended questions from the post-task questionnaire, and student reflections were employed as data triangulation to explain small group interaction patterns and the CW styles. The researcher discovered that there were essential factors, which influenced small group interactions and CW behaviours. These factors included individual goals (i.e., getting a good grade, producing a good quality essay, completing tasks on time, improving writing skills, improving communication skills, and building friendship and learning new things), learners' English proficiency level, individual roles in CW, and topic familiarity.

RQ3. What are the writing change functions and language functions used in collaborative writing when learners are engaged in writing tasks?

The findings showed that learners in small groups produced varied WCFs and LFs while engaging in CW tasks. The most WCFs frequently employed were adding and correcting, whereas reordering was used the least. Learners' use of WCFs were found to influence their weight of contributions to the writing product that subsequently assisted the researcher in identifying their level of equality while engaging in the group task (Li, 2014; Li & Kim, 2016; Li & Zhu, 2017; Wang 2019). Learners' frequent use of WCFs had a positive correlation with their contribution which consequently yield a positive gain on individual writing performance. Such findings could confirm the previous studies of Qiu

and Lee (2020), Zhang (2018), and Zhang and Plonsky (2020) who claimed that the practice of the recursive writing act that involves editing, and revisions could enhance writing skills. Furthermore, the use of LFs by members in small groups while co-constructing their essays propelled them to interact with each other's texts freely. The study revealed that the most LFs frequently produced by small groups while co-constructing their essays were stating and suggesting, whereas the least used LFs were justifying and disagreeing. The findings showed that learner employment of LFs had a positive relationship with text contribution, and it further enhanced individual writing performance. In other words, the frequent use of LFs mirrored the degree of activeness individuals reacted towards group work (Elabdali & Arnold, 2020; Li & Kim, 2016; Wang 2019), which subsequently assisted them in knowledge internalization when performing their own writing. Concisely, it can be inferred that WCFs and LFs in CW process played a significant role in pushing learners to apply the recursive writing process to complete writing tasks and produce a better quality of writing. This claim could further validate the notion of writing as an exploratory and recursive process, but not linear (Abram, 2019; Coulmas, 2013; Curry & Hewings, 2003; Elabdali, 2021; Forbes, 2019; Lowry et al., 2004; Xu, 2018).

RQ4. What are the learners' perceptions of the web-based collaborative writing experience in Google Docs?

The quantitative data analysis revealed that, overall, learners showed high level of perceptions towards their CW in GD. In other words, learners perceived positive experience about group work they performed collaboratively in GD. The qualitative content analysis from semi-structured interviews, open-ended questions from the survey questionnaire, and student reflections showed that learners perceived the usefulness of GD that included being a convenient tool for collaboration, a real-time interaction and communication platform, and a tool for monitoring collaborator's engagement.

Learners perceived GD as a useful tool for online collaboration as it allowed them to work at their convenient time without any restrictions, while such collaboration was hampered by a traditional classroom when learners were required to meet in person

(Alharbi, 2020; Bhowlik et al., 2018; Krishnan et al., 2018; Steinberger, 2017). GD accommodated their online collaboration in which members in small groups could interact with one another on the cloud-based writing (Andrew, 2019; Borowski et al., 2020; Cho, 2017) when members were off campus due to the current pandemic situation. Moreover, learners noted that the cloud-based writing tool provided them space for exchanging linguistic resources and ideas that could enhance writing skills. They discerned that their visible contribution recorded in GD archives would benefit the evaluator to make impartial assessments on individual contribution.

Although the participants showed positive perception towards GD, they perceived some pitfalls about this web-based tool. GD was viewed as an internet-based tool that functions efficiently when the connection is stable. Despite the availability of offline mode rendered by GD, learners do need some computer literacy and software knowledge to avail their smooth operation (Lamont, 2015; Lee & Hassell, 2021). The web-based tool infringes the privacy of writers who contributed texts on cloud, which anyone in the group can see. This caused less-skilled writers to be reluctant to contribute their parts for fear of making mistakes. As advocated by Steinberger (2017), less capable peers in the group might feel pressured and embarrassed to share their work with others for fear of discomfort when errors were identified.

Regarding learners WBCW experience, the study revealed that the participants voiced five major advantages of collaboration on the web-based tool, namely, accelerating the work process, generating a variety of ideas, improving the quality of writing, enhancing communication skills, and learning about different cultures. The participants perceived that WBCW could hasten their work process when a defined objective and individual role were set clear at the planning stage. The work would be accomplished faster when members worked collectively. Furthermore, CW stimulated the team to generate more ideas or perspectives (Abe, 2020; Wang et al., 2020) in that the group could select the best ones to expand on the writing, and enhance critical and analytical skills (Ahmad, 2020; Bakir et al., 2020; Coffin, 2020) to earn good marks. Sharing of linguistic resources while performing CW tasks yielded positive results on writing quality (Abahussain, 2020;

Ajarbshir, 2019; Hsu, 2020; Teng, 2021). Learners perceived WBCW as a learning platform to enhance both written and oral communication skills. Moreover, collaboration in small groups provided the participants opportunities to learn about cultural differences, values, and beliefs. This could help them be more open-minded, cherish individual differences, and prepare them for future career prospects in a multilingual world. Concisely, the researcher provided a condensed summary of the major findings in one page as shown in Figure 7.1.



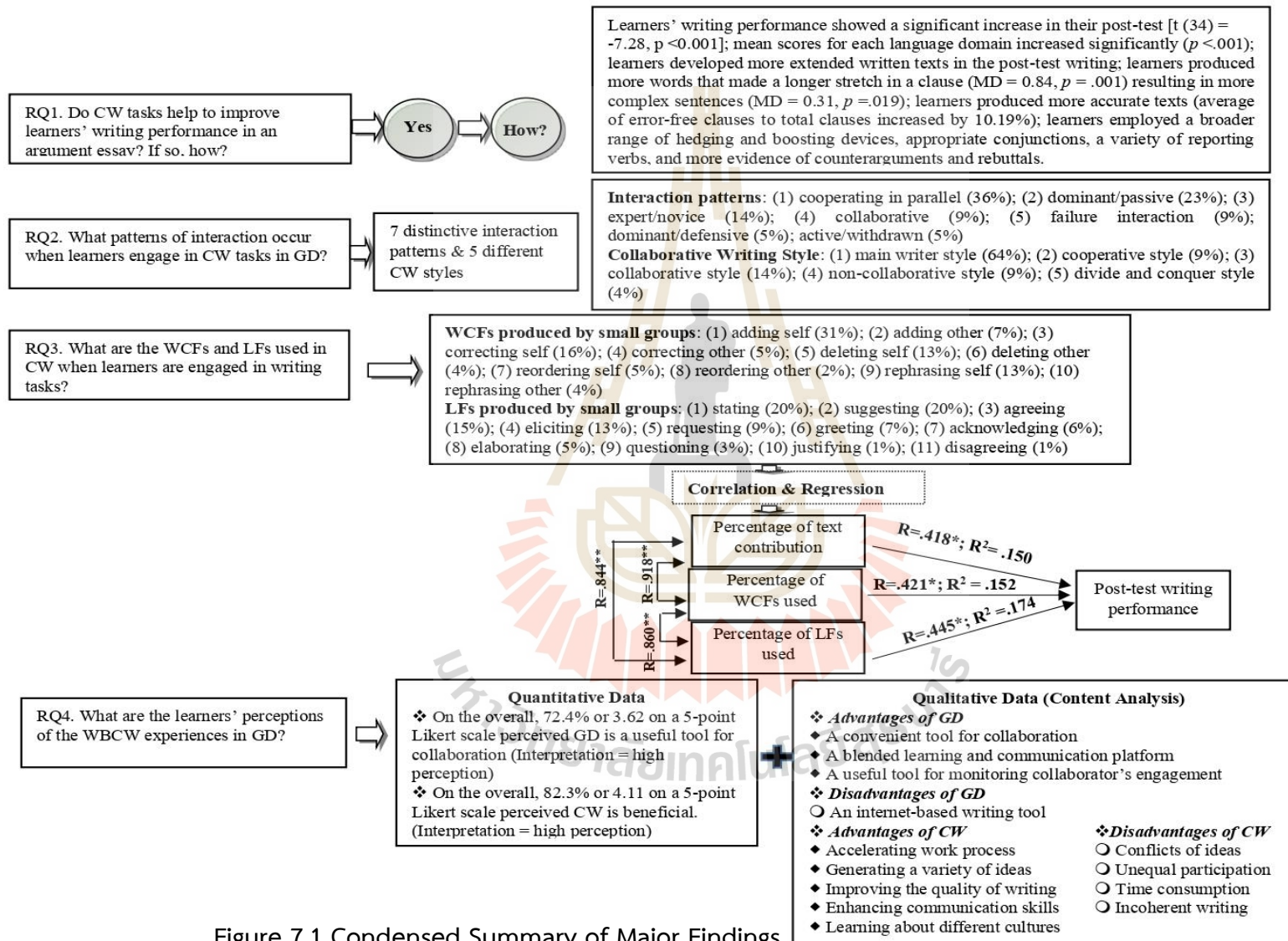


Figure 7.1 Condensed Summary of Major Findings

7.2 Theoretical Implications

The findings of the study may contribute to some theoretical implications, and they were illustrated in the following.

The results of the study could add to the growing body of literature on sociocultural theory, in particular CW in a multilingual EFL classroom context using GD as a writing platform to enhance academic writing skills. The advantages of WBCW depicted in the study alluded to the positive effects of learners' improved writing performance on individual levels. This could affirm the notion of sociocultural theory that human developmental processes take place through collaboration, negotiation, and social interaction in rectifying problems while performing a group task to enhance cognitive skills (Lantolf & Thorne, 2007; Li, 2014; Storch, 2013, 2021; Vygotsky, 1978). It further supported a perceived notion that language not only functioned as a psychological tool to accomplish tasks, but also promoted cognitive development and social interaction between interlocutors (Chen & Lin, 2021; Lantolf & Thorne, 2007; Woolfolk, 2016).

The present study provided a point of view on how learners with cultural diversity interacted with one another in small groups using GD as a collaboration platform. The findings revealed that learners in small groups with varied language proficiency levels performing a CW task scaffolded each other and allowed their ZPD to emerge (Dlab et al., 2020; Donato, 1994; Iba & Yoshikawa, 2016; Li, 2014). In other words, knowledge is brought out and enhanced through members' interaction and peer supports. This positive learning experience assisted them to absorb knowledge for future access, or when they need to take steering control over the task to accomplish the goals by themselves (Baucal, 2013; Krahenbuhl, 2016) after receiving peer scaffolding. Additionally, the study also showed that small group CW behaviours were influenced by individual goals, language proficiency, members' role in group work, and topic familiarity, in which these factors helped explain distinctive small group interaction patterns. This implied that social interaction in academic settings is shaped by both internal and external factors including affective values, language competence, and social role individuals hold that urge them to exhibit the action. As advocated by Iba and Yoshikawa (2016), language and social elements influence our thought and urge

action. The study further presented new findings in a multilingual classroom, particularly in the Asian EFL classroom context that those who contributed texts actively and utilized more LFs in CW tasks negotiation, showed a tendency of improvement in their individual writing performance. This phenomenon showed us that to produce a quality of writing, writers need to endorse an “exploratory and recursive procedure and often peers intervene at several points in the writing process” (Polio & Williams, 2009, p.491).

Lastly, the bottom-up grounded analysis (Yim et al., 2017) generated by DocuViz visualizations revealed that modern technology can demonstrate varied forms of WBCW styles when learners jointly constructed texts in GD (e.g., collaborative, cooperative, divide and conquer, main writer styles, and non-collaboration). These practices offer fresh insights into new literacy and technology and allow learners to perform group work conveniently without venue restrictions often imposed by a conventional classroom (Krishnan et al., 2018; Wang et al., 2015; Warschauer et al., 2019). DocuViz can assist the writing instructor to raise learners’ awareness and inform them of their writing behaviours. The system can eliminate the free-rider problem but boost productive collaboration among the collaborators and optimize their learning continuum. Based on the findings of this present study, the researcher resonated with the outlook that success in academic writing and language learning involves active participation in the assigned tasks, positive engagement in social interactions, and cheerful learning from knowledgeable peers. Aside from the theoretical implications, the present study also suggested some pedagogical implications, including WBCW training, cross-cultural collaboration, WBCW task design, and teacher engagement in collaboration process. These elements were explained in the following section.

7.3 Pedagogical Implications

Integrating technologies into multilingual EFL writing classrooms is worth investing in, although it might involve a great deal of effort and practice at the preliminary stage as learners are not acquainted with online collaboration. WBCW has been proven to have positive effects on learners’ writing performance in terms of language domains including content, organization, and language structures. Learners could produce

longer texts with more complex sentences or clauses in a T-unit. These results suggested that writing instructors in a composition course should consider implementing CW tasks using cloud-based writing tools such as GD into their writing course. This is because CW activities provide abundant opportunities for learners to enhance their language acquisition and linguistic resources via engaging in collaborative interaction and meaningful learning. Based on the findings of the present study, I would signpost some pedagogical implications for the implementation of WBCW in a college composition course as follows.

WBCW Training

From the pre-task questionnaire, only about 14 % (5 out of 35) of the participants reported using GD for their projects in high school prior to participating in the present study. Most of them had never used this cloud-based writing tool for online collaboration. Although the participants received training to use this tool during the preliminary research phase, they did not seem to process the information rightly and were reluctant to engage with peers. Therefore, writing instructors need to consider preparing learners with this CW tool and have them practice using all necessary features embedded in GD, particularly the features used for online interaction with other peers, such as chat box, comment window, text editing, inserting, or review version history to monitor their progress. Learners should receive adequate training to become familiar with the tool. Preparing learners to work together with different cohorts can enhance collaborative results (Zambrano et al., 2019). This will aid them to manipulate the instructional materials spontaneously and make use of the tools to their full benefit. Furthermore, writing instructors should train learners to get familiar with the GD offline mode when they happen to work at a location without Internet access. Learners can edit an offline document and the file can be stored and applied when reconnected to the Internet. These features may seem simple to tech-savvy but can be strenuous for those with limited computer literacy (Lamont, 2015; Neumann & Kopcha, 2019). This was reflected by the participants' qualitative data sources in that most of them perceived GD an internet-based tool and they could only work effectively when there was reliable Internet access.

Inevitably, the current pandemic situation of COVID-19 has propelled educational institutions worldwide to augment the focus on virtual learning by employing digital tools to assist in the web-based learning management systems and engage learners in both online and offline classrooms, and this trend will continue for the near future (Khalil et al., 2020). Therefore, instructors and students need to adjust their teaching and learning approaches, attune themselves to new challenges, and willingly implement a range of multimedia and technologies (Weisberger et al., 2021; Williams & Beam, 2019) to assist their world of acquiring knowledge in the digital age where virtual classrooms become the new norm. The remarkable benefit of WBCW, as observed from the present study, is the course instructor could access learners' writing product anywhere, offer suggestions, or grade the work without having to carry or shuffle papers as practiced in a conventional classroom. The use of GD to assist in online collaboration makes a more meaningful workflow solution between course instructors and learners. A GD file can be viewed and edited synchronously or asynchronously via a mobile application for both iOS and Android, in that learners can work at their own pace and convenience. As advocated by Li and Storch (2017), the web-based tool such as GD can empower writers in various disciplines to write, comment, or edit each other's work conveniently and faster than ever before in human history.

Cross-cultural Collaboration

Since the launch of the ASEAN Economic Community (AEC) in 2015, Thailand has set out to become a hub of international education in the region (Rhein & Jones, 2020). Currently, there are 181 international schools nationwide offering a British-based or American-based education system (Bushell, 2020) enrolled by local and foreign students in its neighboring countries and beyond. This has brought challenges to classroom instructors to teach in multilingual and multicultural classrooms. As diversity increases in the EFL classroom, teachers are challenged to become more conscious about the norms of cultural knowledge and practices. However, the increase in cultural diversity in classrooms rather provides opportunities for both teacher and students to develop cross-cultural communication and learn about each other's differences, practices, and values. Cross-cultural collaboration can enhance interpersonal and

intercultural communication skills as well as raise awareness to understand and respect each other's points of view when learners receive clear guidance and are well prepared.

Aside from investigating the effects of CW in multilingual EFL learners' writing performance, the present study took a stepping stone to explore their interaction patterns and collaborative behaviours in a composition course. Although the participants had never performed a cross-cultural CW project, the majority of them perceived the benefits of small group collaboration. They expressed positive attitudes towards group work after engaging in CW tasks. This was marked by their improved performance in the post-test writing. We may assert that a cross-cultural CW project is beneficial for learners with diverse backgrounds and language proficiencies when the instructional materials are orchestrated effectively. The findings confirmed the notion of ZPD theorized by Vygotsky (1978) when learners with different language skills share their experiences, pool linguistic resources, scaffold one another, they will construct more knowledge and language skills. Surprisingly, two Chinese students used a Chinese saying in their reflections, "three cobblers are equal to one Zhuge Liang", meaning if three cobblers work together they could become as smart as Zhuge Liang, a wise man ever lived in Chinese history. As a researcher of this study, I am convinced that CW in small groups whose members have cultural diversity is attainable and worthwhile researching. Collaboration is a crucial element of 21st century learning skills to drive learners for success in the future (Cummings, 2021; Krishnan et al., 2018). Training multilingual and multicultural learners to perform collaborative tasks will prepare them for future careers when they secure jobs in an international organization. Therefore, to promote and strengthen learner cross-cultural CW projects, language instructors should consider providing them with adequate training on cross-cultural communication skills (Cummings, 2021; Hansen-Thomas & Chennapragada, 2018) and raise their consciousness to embrace cultural diversity. Learners should be educated in handling conflicts while performing a group task since people from diverse cultures may employ distinctive communication strategies, show different reactions, or have new ways of thinking or responding to each other while performing a collaborative writing task. When these learners receive adequate training about cultural values, they

will show respect and build trust in each other, and consequently lead them to a successful collaboration.

WBCW Task Design

Designing tasks in a CW classroom can influence the patterns of peer interaction (Garcia Mayo & Agirre, 2019; Hsu, 2020). Tasks may promote a high scale of collaboration if they address learners' needs and practicalities (Alghasab et al., 2019; Li, 2014). Therefore, it is essential for the course instructors to scrupulously design CW tasks that motivate learners to interact or communicate with each other via a collaborative platform, such as GD. Their interactions can be made synchronously or asynchronously depending on the intended objectives of each task. Synchronous CW provides learners opportunities for real-time or peer-to-peer interaction and increases member engagement (Krishnan et al., 2019). Asynchronous CW, on the other hand, supports learners in extended discussion of content-related materials, better organizational structure, and evidence of in-depth analysis of information (Hsu, 2020; Koszalka, Pavlov, & Wu, 2021). The designed tasks need to be authentic and practical to real life situations. Tasks should not be too simple since learners need a valid reason to collaborate. If task information is effortless and not demanding interactivity, there is no reason for the instructors to require learners to collaborate (Zambrano et al., 2019). A collaborative task should be complex enough that it imposes cognitive demands and collective endeavours from the members.

The present study required learners in small groups to produce two CW tasks. Learners were given an extended period of three weeks to complete each task. The researcher assigned four modified controlled topics for each essay derived from their course book with a perceived notion that optional topics would produce richer data for analysis in regards to peer interaction patterns. For example, Group 1 whose members had seen the campus in person chose to describe the university landmarks for their descriptive essay. The group could produce rich and vivid descriptions as they scaffolded each other during the online CW process. Whereas Group 7 whose members resided in different venues chose to describe beautiful places in Southeast Asian countries by selecting the best-known tourist destinations from their countries. Likewise, the group produced detailed picturesque descriptions, and the leader

assisted the other two members with language issues. Although the members did not meet each other in person due to the COVID-19 pandemic during the time when data was being collected, the team collaborated successfully. Therefore, designing a CW task is immensely crucial for it serves as a threshold to captivate learner participation. It is not a technological tool that promotes the degree of collaboration, but the task types that enthrall learners in collaboration (Guo et al., 2020; Li, 2014).

Teacher Engagement in the Collaboration Process

Teachers play a significant role in improving learner participation in group projects; however, they should take the role of facilitator, counselor, or mediator to provide constructive feedback at appropriate intervals to assist small group's CW efforts and ensure the work process operates smoothly. Teachers should be careful to avoid inserting themselves as information feeders or acting as catalysts to shape or twist learners' collaboration or interaction behaviours when they aspire to observe peer-to-peer interactions in a natural setting. A collaborative classroom teacher can enhance learner participation by creating a learning atmosphere in which every member has chances to express their viewpoints and collectively explore ideas in depth from different angles (Aziz & Kazi, 2019). However, teachers need to accept that even plenty opportunities are given, not every student participates equally or at the same rate due to their distinctive learning styles and preferences. Nonetheless, a teacher's presence in small group collaboration and in taking their role as monitor and regulator of setting ground rules for group collaboration, promoting co-constructing of texts, and providing dialogic feedback on learners' writing have proven to boost learner participation and interaction while performing a CW project (Alghasab et al., 2019). Without teacher interventions, cross-cultural collaborative learning is unlikely to occur. The last section of this chapter demonstrated some limitations of the present study and provided recommendations for further investigations.

7.4 Limitations and Recommendations for Further Research

Although this study has generated some positive effects of CW on learners' writing performance and supported the integration of web-based collaborative tools such as GD in a composition course to explore how learners in small groups with cultural

differences interacted, collaborated, and contributed to their group writing, the study has some limitations, which deserved further investigations.

Firstly, the sample size of the study is relatively small as it involved only 35 first year undergraduate students representing nine nationalities from Asian countries, limited to only one small-size international university in Thailand. These learners were new to teaching and learning in an international environment. They had very limited exposure to taking other university courses. Furthermore, 16 of the participants (45.7%) undertook the course online due to the COVID-19 pandemic during the time data were collected. Therefore, the findings may not be generalizable to other similar contexts. To delimit the study, future research may include multiple samples in other EFL or ESL contexts and not limited to Asian university students only. Therefore, future research may replicate the study with a larger sample size and extend the study with other subjects in different academic disciplines or with junior or senior university students who have been exposed to various college subjects, to improve the validity and reliability of the present study.

Secondly, a control group with similar language proficiency level should be included in the future research to increase the validity of the findings since the present study employed a pre-experimental design in which the researcher could not fully control threats to its internal validity when examining the effects of CW tasks on learners' post-test writing performance. Therefore, changes or improvement of learners' writing performance might not be fully claimed to be the factual outcome of the intervention. There might be unknown confounding factors that may indirectly influence learners' writing performance. Using both experimental and comparison groups will allow researchers to observe the effects of the treatment in a wider range, increase experimental validity and reliability, and strengthen the assertions of research findings.

Thirdly, the study explored small groups' CW patterns and LFs used by team members while performing group tasks aside from investigating the effects of CW tasks on individual writing performance. This was a reason why a single group was used as an embedded case study consisting of multiple subgroups for exploration. However, only two main CW tasks (descriptive and argumentative essays) were implemented

although learners in small groups were engaged in some forms of collaboration in other essay writings. Employing two extended CW assignments was relatively short for collecting both quantitative and qualitative data set for an embedded case study. It is essential to take into consideration and further investigation if collaborative behaviours or improved writing performance would have a long-term impact on learners' academic writing skills when they move to a higher-level course. Future studies may consider investigating a wider variety of CW tasks with other types of writing genres that might have influenced group writing processes, interaction patterns, and quality of jointly composed texts. Moreover, the participants self-selected their teammates and remained in the same group for both tasks. Future research may consider exploring how changing of group partners for divergent CW tasks would affect their roles in collaboration, level of involvement, or change in interactional behaviours. Future research may consider extending the research timeline to gather richer data or employing longitudinal studies since the effects of the current CW may not be substantially based on a single collaborative experience. This dissertation sheds some light on this direction.

Lastly, the study employed GD as a CW platform for small groups. Although GD has been proven an effective tool for learners to perform group work online, there are various kinds of social media platforms available nowadays. Small group interactions or peer-to-peer interactions are not all visible in GD text-chat or comment window although learners are controlled. Inevitably, other robust social media sites, such as Facebook, Messenger, Microsoft Teams, EtherPad, WeChat, Twitter, or Line, work powerfully to engage members in collaboration or interaction. This suggestion follows Cho's (2017) inquiries for more studies on web-based applications to be integrated in L2 classroom and Masterson's (2020) remarks on integration of digital technologies to enhance learners in foreign language classrooms. Thereby, the employment of other social media for collaborative learning may yield dissimilar results from the current study. Future research may investigate other WBCW tools and study their influence on group or peer interactions, and the effects of these web-based tools on learners' academic writing skills, text quality, and language development.

To sum up, this research has produced some important findings portraying that WBCW tasks have positive effects on learners' academic writing performance. Learners produced longer texts containing more complex sentence structures. During small group collaboration processes, learners employed varied WCFs and LFs to interact with each other resulting in dynamic group interaction patterns and CW styles. The findings revealed that the frequent use of WCFs and LFs yielded a positive gain on individual academic writing performance. Learners perceived the usefulness of WBCW as it accelerated the work processes, generated more language resources and ideas, improved the quality of writing, enhanced communication skills, and provided opportunities to learn about other cultures. Since this dissertation has brought a stepping stone for other researchers whose interest dwells on web-based collaboration in a multilingual EFL classroom context or exploration of cross-cultural collaboration in an L2 classroom, which is undeniable to become a realm of increasing significance in the future, further investigations and widespread research need to be undertaken.

In summary, this chapter drew conclusions and implications of the present study. In the first section, the major findings were summarized. In the second section, the theoretical implications were presented. The pedagogical implications attained from the study were also discussed. Lastly, limitations and recommendations for future research were proposed.

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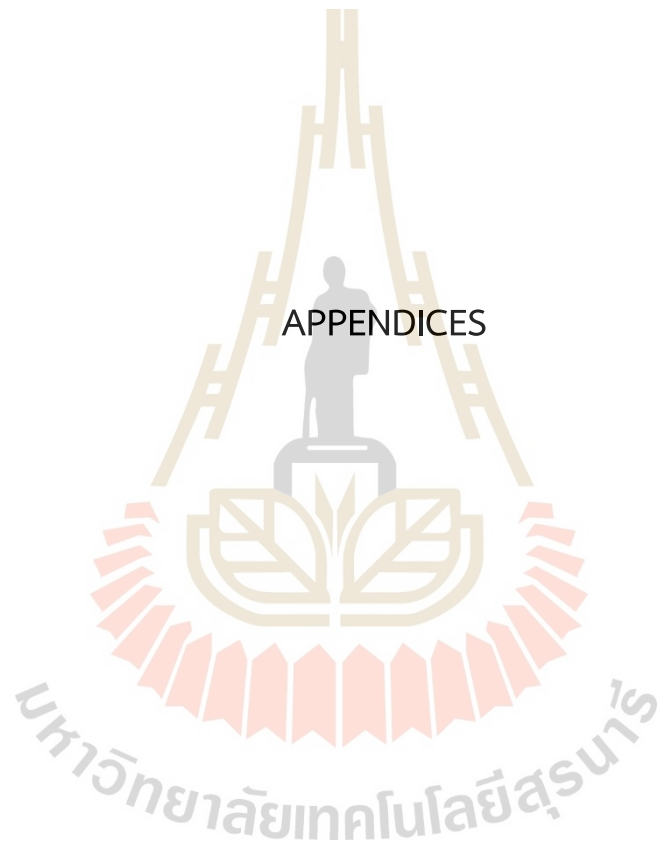
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APPENDICES



APPENDIX A

Pre-test and Post-test Writing Instructions

Instructions: Learners are required to compose an opinion essay of approximately 400 – 500 words with a given time of 70 minutes by using Moodle Learning Management System in the university computer laboratory.

Essay Topic:

All levels of education, from primary school to university, should be free of charge.

To what extent do you agree with this opinion? Write to express your thoughts and share your perceptions.

Your writing will be evaluated using the *Composition Analytic Scoring Rubric* of Jacob et al. (1981) which scores on content (30 pts), organization (20 pts), vocabulary (20 pts), language use (25 pts), and mechanics (5 pts).

APPENDIX B

Validation Form of Pre-test and Post-test Writing

The objective of this validation form is to assess the usefulness of the pre-test and post-test writing (Appendix A), which includes the construct validity, relevance, practicability.

Instructions: Please read the objectives of the pre-test and post-test writing instructions and put a tick (✓) in front of the statement ‘Yes’ or ‘No’. If your answer is ‘No’, please kindly give comments for improvement.

Criteria	Answer and Comments
1. Do the pre-test and post-test writing correspond to the learning objectives?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments: _____ _____
2. Are the pre-test and post-test appropriate to measure learners' writing achievement?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments: _____ _____
3. Is the essay topic for the pre-test and post-test writing relevant to learners at the university level?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments: _____ _____
4. Is the essay topic useful to practice writing skills in the university level?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments: _____ _____
5. Are the instructions clear and comprehensible?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments: _____ _____

Criteria	Answer and Comments
6. Is the allotted time for the pre-test and post-test writing appropriate?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments: <hr/> <hr/>

Note: ENGL 111 English Composition Course Description and Learning Objectives

Course Description

English composition I intends to equip students to think critically and write logically . Students learn to write essays using the four principles of unity, support, coherence, and sentence skills.

Objectives:

At the end of the course, the students should be able to:

1. Demonstrate an understanding of the fundamentals of an accurate sentence, paragraph, and essay structure
2. Develop grammatical accuracy to write clearly and effectively
3. Articulate an understanding of the basic principles of the four steps in the writing process: begin with a thesis, support the thesis with specific evidence, organize and connect the specific evidence, and revise and edit sentences
4. Edit, revise, and rewrite their essays using the four bases: unity, support, coherence, and sentence skills
5. Demonstrate the ability to write descriptive, narrative, expository and argumentative essays that are organized, clear, and accurate

APPENDIX C

IOC Analysis of Pre-test and Post-test Writing Instructions

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q1	+1	+1	+1	1.00	Good
Q2	+1	+1	+1	1.00	Good
Q3	+1	+1	+1	1.00	Good
Q4	+1	0	+1	0.67	Acceptable
Q5	+1	+1	+1	1.00	Good
Q6	+1	+1	+1	1.00	Good
Total	6	5	6	0.94	Good

- Notes:
1. +1 = the item is congruent with the objective
 2. -1 = the item is not congruent with the objective
 3. 0 = uncertain about the item

The result of IOC:

$$(IOC = \sum R / N)$$

Number of item: 6

R = 6+5+6 = 17 (Scores from the experts)

N = 3 (Number of experts)

$$IOC = 17/3 = 5.67$$

$$\text{Percentage: } 5.67/6 \times 100\% = 94.5\%$$

The analysis result of IOC is 5.67 and the percentage is 94.5%, which is higher than 80%. This can be interpreted that the items of pre-test and post-test instructions are appropriate for adoption in the main study.

APPENDIX D

Composition Analytic Scoring Rubric

The analytic rating scale created by Jacob et al. (1981) has received over one thousand citations as shown in Google Scholar for being more thorough and criterion-referenced covering five major writing components (content, organization, vocabulary, language, and mechanics) in assessing various aspects of the EFL/ESL learners' writing skills.

CONTENT

Score	Criteria
30-27	EXCELLENT TO VERY GOOD: knowledgeable; substantive; thorough development of thesis; relevant to assigned topic
26-22	GOOD TO AVERAGE: some knowledge of subject; adequate range; limited development of thesis; mostly relevant to topic, but lacks detail
21-17	FAIR TO POOR: limited knowledge of subject; little substance; inadequate development of topic
16-13	VERY POOR: does not know knowledge of subject, non-substantive; not pertinent; OR not enough to evaluate

ORGANIZATION

Score	Criteria
20-18	EXCELLENT TO VERY GOOD: fluent expression; idea clearly stated/supported; succinct; well-organized; logical sequencing; cohesive
17-14	GOOD TO AVERAGE: somewhat choppy; loosely organized but main idea stands out; limited support; logical but incomplete sequencing
13-10	FAIR TO POOR: non-fluent; ideas confused or disconnected; lacks logical sequencing and development
9-7	VERY POOR: does not communicate; no organization; OR not enough to evaluate

VOCABULARY

Score	Criteria
20-18	EXCELLENT TO VERY GOOD: sophisticated range; effective word/idiom choice and usage, word form mastery; appropriate register
17-14	GOOD TO AVERAGE: adequate range; occasional errors of word/idiom form, choice, usage <i>but meaning not obscured</i>
13-10	FAIR TO POOR: Limited range, frequent errors of word/idiom form, choice, usage, <i>meaning confused or obscured</i>
9-7	VERY POOR: essentially translation; little knowledge of English vocabulary, idioms, word form; OR not enough to evaluate

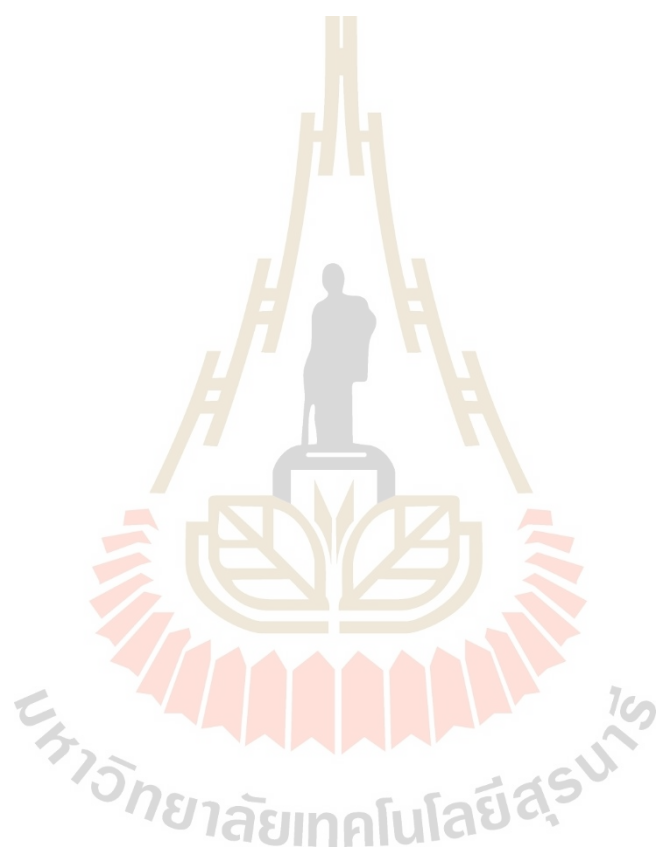
LANGUAGE USE

Score	Criteria
25-22	EXCELLENT TO VERY GOOD: effective complex construction; few errors of agreement, tense, number, word order/function, articles, pronouns, prepositions
21-18	GOOD TO AVERAGE: effective but simple constructions; minor problems in complex constructions; several errors of agreement, tense, number, word order/functions, articles, pronouns, prepositions <i>but meaning seldom obscured</i>
17-11	FAIR TO POOR: major problems in simple/complex constructions; frequent errors of negation, agreement, tense, number, word order/function, articles, pronouns, prepositions and/or fragments, run-ons, deletions, <i>meanings confused or obscured</i>
10-5	VERY POOR: virtually no mastery of sentence construction rules; dominated by errors; does not communicate; OR not enough to evaluate

MECHANICS

Score	Criteria
5	EXCELLENT TO VERY GOOD: demonstrates mastery of conventions; few errors of spelling, punctuation, capitalization, paragraphing
4	GOOD TO AVERAGE: occasional errors of spelling, punctuation, capitalization, paragraphing <i>but meaning not obscured</i>
3	FAIR TO POOR: frequent errors of spelling, punctuation, capitalization, paragraphing; <i>meaning confused or obscured</i>
2	VERY POOR: no mastery of conventions; dominated by the errors of spelling, punctuation, capitalization, paragraphing, OR not enough to evaluate

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House Publishers, Inc.



APPENDIX E

Participants' Pre-test and Post-test Scores

Students	Pre-test Scores				Post-test Scores			
	Rater 1	Rater 2	Rater 3	Average	Rater 1	Rater 2	Rater 3	Average
STD1	74.0	71.0	77.0	74.0	79	82	81	81.0
STD2	65.0	70.0	62.0	65.7	70	69	72	70.7
STD3	80.0	81.0	87.0	82.7	92	88	95	92.0
STD4	56.0	61.0	52.0	56.3	67	62	66	65.0
STD5	63.0	66.0	75.0	68.0	71	67	68	69.0
STD6	63.0	62.0	63.0	62.7	76	73	75	74.7
STD7	63.0	64.0	72.0	66.3	77	79	81	79.0
STD8	70.0	68.0	78.0	72.0	91	87	92	90.3
STD9	63.0	60.0	50.0	57.7	56	61	60	59.0
STD10	73.0	77.0	71.0	73.7	77	82	77	78.7
STD11	57.0	60.0	69.0	62.0	79	83	81	81.0
STD12	61.0	59.0	71.0	63.7	80	77	82	79.7
STD13	64.0	63.0	71.0	66.0	72	73	76	73.7
STD14	66.0	65.0	72.0	67.7	64	65	61	63.3
STD15	89.0	84.0	89.0	87.3	91	93	95	93.3
STD16	62.0	65.0	67.0	64.7	85	87	82	84.7
STD17	92.0	83.0	90.0	88.3	87	92	90	89.7
STD18	84.0	79.0	76.0	79.7	89	91	93	91.0
STD19	86.0	82.0	89.0	85.7	89	92	88	89.7
STD20	65.0	56.0	49.0	56.7	63	59	58	60.0
STD21	61.0	61.0	67.0	63.0	62	61	64	62.3
STD22	73.0	68.0	74.0	71.7	72	67	71	70.0
STD23	62.0	64.0	70.0	65.3	64	65	70	66.3
STD24	61.0	65.0	65.0	63.7	74	76	76	75.3
STD25	66.0	65.0	63.0	64.7	81	77	85	81.0
STD26	60.0	59.0	54.0	57.7	66	68	71	68.3
STD27	62.0	67.0	58.0	62.3	68	65	69	67.3
STD28	61.0	57.0	59.0	59.0	65	64	61	63.3
STD29	60.0	65.0	54.0	59.7	65	61	66	64.0
STD30	68.0	65.0	55.0	62.7	65	67	61	64.3
STD31	56.0	57.0	48.0	53.7	72	70	66	69.3
STD32	59.0	55.0	57.0	57.0	63	62	66	63.7
STD33	59.0	60.0	68.0	62.3	73	76	71	73.3
STD34	64.0	62.0	72.0	66.0	74	73	70	72.3
STD35	63.0	65.0	66.0	64.7	73	76	72	73.7

Note:

Advanced level = Can use English effectively for social interaction, academic and professional purposes and understand virtually everything heard or read. Able to summarize information from different spoken and written sources

Upper-intermediate = Can use English fluently and spontaneously and able to produce clear, detailed text on a wide range of subjects

Intermediate = Can use English fairly fluently and able to produce simple connected text on topic of familiarity or of personal interest

Pre-intermediate = Can use simple English fairly comfortably and able to communicate in simple and routine matters or describe simple terms and matters in areas of personal needs

Beginner = Can use simple English and everyday expressions to satisfy simple needs, and able to introduce oneself and others with simple expressions

10. Have you ever participated in any collaborative writing project?

- yes no not sure

If your answer is 'yes' what tool do you use for your collaborative writing assignment? (e.g., blog, Facebook, Line, messenger, wikis, Google Docs, etc.)

.....

11. Have you ever used Google Docs for your writing assignments?

- yes no

If your answer is 'yes', briefly comment on the advantages or disadvantages of using Google Docs.

.....

12. Your experience of working in a small group is perceived to be:

- very positive positive neutral negative very negative

13. Your learning style is perceived to be more on:

- self-oriented (prefer individual work)
- pair-oriented (prefer pair work)
- group-oriented (prefer group work)
- mixed (prefer both individual and group work)

14. Your attitude toward collaborative writing activity is:

- very positive positive neutral negative very negative

15. Do you believe that the quality of group work is better than individual work?

- yes no not sure

APPENDIX G

Post-task Questionnaire

Student ID..... Date

Part I. Instructions: This questionnaire is designed for a study on small group collaborative writing activities via Google Docs in the English composition course. Please answer all the following questions after participating in collaborative writing tasks via Google Docs as a platform for collaborative writing tool. Please read each statement carefully and honestly indicate your choice with a tick (✓) on the 5-point scale that most reflects your perception. Thank you very much for your kind cooperation in completing the questionnaire.

The scores are rated as:

1 = strongly disagree 2 = disagree 3 = unsure 4 = agree 5 = strongly agree

Perceived Usefulness of Google Docs	SA	A	U	D	SD
	5	4	3	2	1

1. Google Docs is a useful tool for collaborative writing tasks.
 2. I enjoyed working on Google Docs for collaborative writing tasks.
 3. My experience with collaborative writing tasks via Google Docs is positive.
 4. I could contribute to my group when I use Google Docs.
 5. I used the 'History' module in Google Docs to view changes before I revised or edited the writing task.
 6. My group members and I rarely interacted in Google Docs but used other social media platforms (e.g., Facebook, Line, emails, etc.) to discuss the group task.
-

Perceived Usefulness of CW in Google Docs	SA	A	U	D	SD
	5	4	3	2	1

7. Collaborative writing tasks in Google Docs can improve my writing skills.

8. I like collaborative writing tasks in Google Docs because it has a positive impact on writing quality.

9. Collaborative writing tasks in Google Docs help me pay attention to the use of language.

Perceived Usefulness of CW in Google Docs	SA	A	U	D	SD
	5	4	3	2	1

10. Collaborative writing tasks in Google Docs can easily develop essay content, structure, and organization.

11. Collaborative writing tasks in Google Docs can improve the quality of group work.

12. I perceived that the revision process improves the quality of writing.

13. Collaborative writing tasks in Google Docs promote interaction and group achievement.

14. Collaborative writing tasks in Google Docs promote interaction between members in the group.

15. Collaborative writing tasks in Google Docs promote learning-friendly environment.

16. My group partners valued my contributions in the collaborative writing tasks.

17. The members in my group interacted positively to the collaborative writing tasks.

Perceived Usefulness of DocuViz	SA	A	U	D	SD
	5	4	3	2	1

18. DocuViz embedded in Google Docs raised awareness of member participation.

19. DocuViz embedded in Google Docs helped me monitor my contribution.

20. DocuViz is a useful tool to encourage group members' equal participation.

21. DocuViz helped monitor group members' participation to reach consensus on the final draft.

Part II. Short Answers (guiding questions)

1. Write to express your thoughts about the advantages of collaborative writing tasks in Google Docs. What did you like about it?
2. Write to express your thoughts about the disadvantages of collaborative writing tasks in Google Docs. What did you dislike about it?
3. Write to describe your role in your group writing tasks
4. Write to express your overall impression of collaborative writing tasks in Google Docs
5. Leave your comments or recommendations to improve the collaborative writing tasks when a similar activity is carried out in the future.



APPENDIX H

IOC Analysis of Pre-task Questionnaire

Instruction: Please read each item in the pre-task questionnaire and rate “1” for the item that is relevant to the objective of the study, “-1” for the item that is not relevant to the objective, and “0” for the item that you are not sure if it is relevant to the main objective of the study.

Objective: To explore EFL learners’ perceptions of their web-based collaborative writing experiences in Google Docs

Note: The pre-task questionnaire gathers respondent’ personal data and his/her English language learning experiences and general perception of group work.

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q1	+1	+1	+1	1.00	Good
Q2	+1	+1	+1	1.00	Good
Q3	+1	+1	+1	1.00	Good
Q4	+1	+1	+1	1.00	Good
Q5	+1	+1	+1	1.00	Good
Q6	+1	+1	+1	1.00	Good
Q7	+1	+1	+1	1.00	Good
Q8	0	+1	+1	0.67	Acceptable
Q9	0	+1	+1	0.67	Acceptable
Q10	+1	+1	+1	1.00	Good
Q11	0	+1	+1	0.67	Acceptable
Q12	+1	+1	+1	1.00	Good
Q13	+1	+1	+1	1.00	Good
Q14	+1	+1	+1	1.00	Good
Q15	+1	+1	+1	1.00	Good
Total	12	15	15	0.93	Good

- Notes:
- +1 = the item is congruent with the objective
 - 1 = the item is not congruent with the objective

3. 0 = uncertain about the item

The result of IOC:

$$(IOC = \sum R / N)$$

Number of item: 15

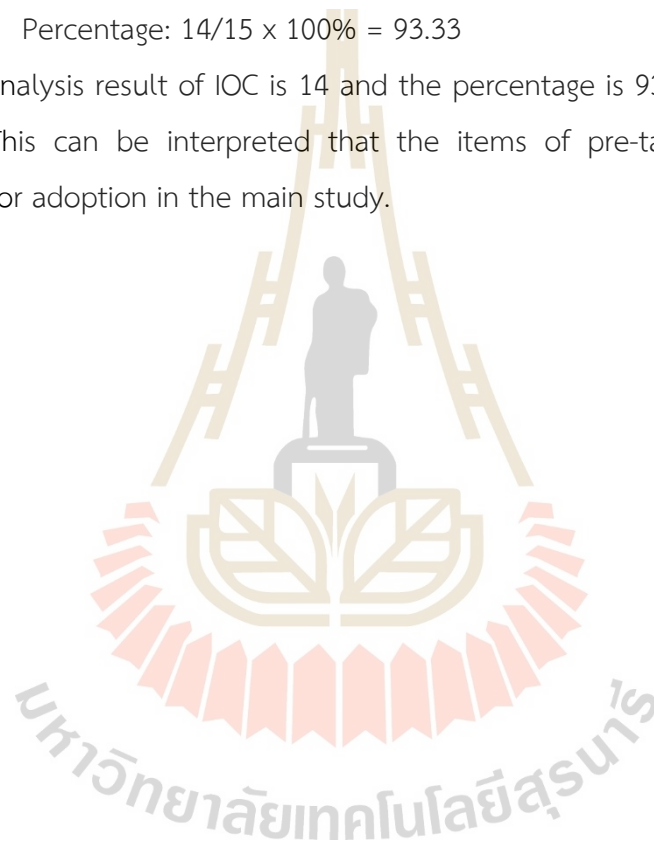
$$R = 12+15+15 = 42 \text{ (Scores from the experts)}$$

$$N = 3 \text{ (Number of experts)}$$

$$IOC = 42/3 = 14$$

$$\text{Percentage: } 14/15 \times 100\% = 93.33$$

The analysis result of IOC is 14 and the percentage is 93.33%, which is higher than 80%. This can be interpreted that the items of pre-task questionnaire are appropriate for adoption in the main study.



APPENDIX I

IOC Analysis of Post-task Questionnaire

Part I. This questionnaire is designed for a dissertation study on small group collaborative writing activities via Google Docs in the English composition course.

Instruction: Please read the questionnaire items carefully and rate “1” for the item that is congruent with the objective, “-1” for the item that is not congruent with the objective, and “0” for the item that you are not sure if the item is congruent with the objective.

Objective: To explore EFL learners’ perceptions of their web-based collaborative writing experiences in Google Docs

Note: Items 1 to 4 in the questionnaire are related to participants’ general experience in using Google Docs for collaborative writing tasks

Items 5 to11 discuss participants’ perceptions of using Google Docs in relation to writing improvement

Items 12 to 17 address participants’ perceptions of group interactions in the collaborative writing tasks

Items 18-21 involves with participants’ perceptions of DocuViz, data visualization tool embedded in Google Docs that raises awareness of member participation

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q1	+1	+1	+1	1.00	Good
Q2	+1	+1	+1	1.00	Good
Q3	+1	+1	+1	1.00	Good
Q4	+1	+1	+1	1.00	Good
Q5	+1	+1	+1	1.00	Good

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q6	+1	+1	+1	1.00	Good
Q7	0	+1	+1	0.67	Acceptable
Q8	+1	+1	+1	1.00	Good
Q9	+1	+1	+1	1.00	Good
Q10	+1	+1	+1	1.00	Good
Q11	+1	+1	+1	1.00	Good
Q12	+1	+1	+1	1.00	Good
Q13	0	+1	+1	0.67	Acceptable
Q14	+1	+1	+1	1.00	Good
Q15	+1	+1	+1	1.00	Good
Q16	+1	+1	+1	1.00	Good
Q17	+1	+1	0	0.67	Acceptable
Q18	+1	+1	+1	1.00	Good
Q19	+1	+1	+1	1.00	Good
Q20	+1	+1	+1	1.00	Good
Q21	+1	+1	+1	1.00	Good
Total	19	21	20	0.95	Good

Notes:

1. +1 = the item is congruent with the objective
2. -1 = the item is not congruent with the objective
3. 0 = uncertain about the item

The result of IOC:

$$(IOC = \sum R / N)$$

Number of item: 21

R = 19+21+20 = 60 (Scores from the experts)

N = 3 (Number of experts)

$$IOC = 60/3 = 20$$

$$\text{Percentage: } 20/21 \times 100\% = 95.23\%$$

Part II. Short Answers (guiding questions)

Instruction: Please read the questions below and rate “1” for the item that is congruent with the objective, “-1” for the item that is not congruent with the objective, and “0” for the item that you are not sure if the item is congruent with the objective.

Objective: To explore EFL learners’ perceptions of their web-based collaborative writing experiences in Google Docs

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q1	+1	+1	+1	1.00	Good
Q2	+1	+1	+1	1.00	Good
Q3	+1	+1	+1	1.00	Good
Q4	+1	+1	+1	1.00	Good
Q5	+1	+1	+1	1.00	Good
Total	5	5	5	1.00	Good

- Notes:
1. +1 = the item is congruent with the objective
 2. -1 = the item is not congruent with the objective
 3. 0 = uncertain about the item

The result of IOC:

$$(IOC = \sum R / N)$$

Number of item: 5

$$R = 5+5+5 = 15 \text{ (Scores from the experts)}$$

$$N = 3 \text{ (Number of experts)}$$

$$IOC = 15/3 = 5$$

$$\text{Percentage: } 5/5 \times 100\% = 100\%$$

The analysis result of IOC for the post-task questionnaire items in part I is 20 and the percentage is 95.23%, whereas the analysis result of IOC in part II is 5 and the percentage is 100%. This can be interpreted that the post-task questionnaire is appropriate for adoption in the main study.

APPENDIX J

Lesson Plan for Collaborative Writing Task 1

- | | |
|------------------------|--|
| 1. Lesson Plan Topic: | Description |
| 2. Level of Learners: | First-Year University Students at Asia-Pacific International University |
| 3. No. of Group: | 11 (35 students: 3-4 members per group) |
| 4. No. of Class Hours: | 7 periods (350 minutes) |
| 5. Objectives: | <p>By the end of the lesson, the students will be able to</p> <p>5.1 describe a situation, a place, an experience, or a person by using specific adjectives with vivid details that appeal to readers' senses.</p> <p>5.2 demonstrate appropriate use of prepositional phrases in describing a situation, a place, an experience, or a person to help the readers form a clear-cut mental picture of what being described.</p> <p>5.3 demonstrate collaborative learning skills in small groups via Google Docs (a web-based collaborative platform).</p> <p>5.4 compose a good descriptive essay in small groups via Google Docs.</p> |
| 6. Target Task: | <p>6.1 Apply useful strategies to collaboratively compose a vivid detailed description to help readers perceive sensory details (sight, sound, touch, smell, and taste) in what being described.</p> <p>* A useful strategy for a descriptive essay is to use words specific to the five sensory system: visual, auditory, kinesthetic, olfactory, and gustatory</p> <p><i>Examples:</i></p> <p>sight: <i>small, big, clear, sharp, dark, bright, flash, light etc</i></p> <p>sound: <i>whisper, scream, shout, cry, utter, murmur etc.</i></p> |

touch: feel, warm, cold, chilly, joyful, peaceful, shiver etc.

smell: sweet, fragrant, odor, rotten, pungent

taste: salty, sour, sweet, bitter, fresh, juicy, spicy, acidic, etc

Recommended descriptive essay topics for CW task:

- a) Describing your university
- b) Describing your favorite place
- c) Describing vegetarian dishes at the university canteen
- d) Describing an unforgettable event

7. Teaching Procedure:

Period	Activity	Learning and Teaching Activity	Duration	Learning Mode
1	Introducing descriptive essays Brainstorming	<ul style="list-style-type: none"> Have students watch a video clip on how to construct a good descriptive essay (https://www.youtube.com/watch?v=vZXn0TbJrlw). Have students brainstorm on a given topic (e.g. a graduation day at AIU). (activity created in Google Docs). Have students sit in small groups and get them practice sequential writing on a given topic (e.g. a graduation day at AIU - activity created in Google Docs (GD) and each group practices this separately). 	50 minutes	Small group collaboration
2	Outlining	<ul style="list-style-type: none"> Illustrate how to develop ideas/opinions by listing words/phrases related to the topic in the Google Docs file. Present descriptive organization to students <ul style="list-style-type: none"> - <i>Introduction</i> (the hook introduces the object or event in the description and gets the reader's attention) (the middle sentences provide the background) (the thesis statement tells why the object described is important to the writer) - <i>Body paragraphs</i> (most of the descriptive details are in the three body paragraphs) (adjectives and adverbs make the experience more vivid and colorful) 	50 minutes	Small group collaboration

Period	Activity	Learning and Teaching Activity	Duration	Learning Mode
		<p>(the scene is often described with prepositional phrases) (comparisons, such as similes and metaphors, can create vivid sight and sound images, and enhance expressiveness and emotions)</p> <p>- <i>Conclusion</i> (The conclusion gives the writer's final opinion about the item described in the passage)</p>		
3	Learning from descriptive essay models	<ul style="list-style-type: none"> Have students study descriptive essay models in small groups. [present 3 model essays: (1) "The Best Pizza in Town" (2) "How to Eat a Guava" from Savage & Mayer, 2012, pp. 29, 34, and (3) "Family Portrait" from Langan & Albright, 2019, pp. 205-206]. Discuss the outline, thesis statement, supporting details and the concluding paragraph of each model essay. Give critique or comments on the essays (work in small groups and present findings to classmates). Have students in small groups discuss the post-reading questions. 	50 minutes	Small group collaboration
4	Drafting	<ul style="list-style-type: none"> Model a high-level direction in which the document will be going, including major sections and subsections. Information is based on brainstormed ideas. Outlining is done in Google Docs. During this writing process, students will learn to use prepositional phrases or similes in the descriptive writing and apply techniques of writing a description from the model essays presented in the previous lesson. Compose a descriptive essay (small groups of 3 may choose to divide up the task or work together step by step depending on group consensus). <p><i>**Members continue working on their draft outside class hours – asynchronous writing.</i></p>	50 minutes	Small group collaboration
5	Practice on division-classification checklist (the four bases: unity, support, coherence, and sentence skills)	<ul style="list-style-type: none"> Use a descriptive checklist to guide students to practice checking each other's language inputs that include content, organization, and language use. Encourage students to develop group task asynchronously at their time of convenience outside classroom setting. 	50 minutes	Small group collaboration

Period	Activity	Learning and Teaching Activity	Duration	Learning Mode
6	Reviewing	<ul style="list-style-type: none"> • Designate students to roles as reviewer, editor, or proofreader, or everyone works together collaboratively to improve content and organization, language use which includes grammar, spelling, word choice, tense, and other mechanics. The reviewing process is done through web-based collaborative tool (Google Docs) by using both peer editing checklist and descriptive checklist. At this reviewing process the group members should pay attention to the use of adjective order, vivid adjectives to describe sensory details. • Give comments and feedback to improve the quality of CW draft (micro-level and macro-level) to students. 	50 minutes	Small group collaboration
7	Revising Copyediting	<ul style="list-style-type: none"> • Justify review comments by making incorporated changes in the draft based on suggestions. This includes adding words or sentence, removing irrelevant words or sentences, moving or changing a word or placement of a sentence, or even substituting words or sentences for new ones. • Encourage students to revise their work asynchronously at their time of convenience outside classroom setting prior to submitting their final draft for grading. • The process of making final changes that are universally administered to a document to make a document more consistent (such as copy edits, grammar, logic) usually made by a dominant member in the group charged with this responsibility (Lowry et. al., 2004). 	50 minutes	Small group collaboration

APPENDIX K

Lesson Plan for Collaborative Writing Task 2

1. Lesson Plan Topic: An Argument Essay
2. Level of Learners: First-Year University Students at Asia-Pacific International University
3. No. of Group: 11 (35 students: 3-4 members per group)
4. No. of Class Hours: 8 hours (400 minutes)
5. Objectives:
 - By the end of the lesson, the students will be able to
 - 5.1 use appropriate transitions and connectors in an argument essay.
 - 5.2 analyze the difference between effective and ineffective argument essays
 - 5.3 apply rhetorical devices and strategies (e.g., courteous language or counterargument, acknowledge different viewpoints, rebut differing viewpoints or refutation) to develop an effective argument essay.
 - 5.4 demonstrate collaborative learning skills in small groups via Google Docs (a web-based collaborative platform).
 - 5.5 compose an effective argument essay in small groups via Google Docs
6. Target Task:
 - 6.1 Apply useful strategies to compose an effective and convincing argument essay in Google Doc.
 [Some useful strategies for an argument essay are such as use tactful, courteous language, point out common ground, acknowledge different viewpoints, grant the merits of differing viewpoints, and rebut differing viewpoints] (Langan & Albright, 2019)

Recommended argumentative essay topics for CW task:

- a) Should curfews be imposed on campus?
- b) Is college education necessary?
- c) Should college students have part-time jobs while they study?
- d) Should non-vegetarian dishes be served in the university canteen?

7. Teaching Procedure:

Period	Activity	Learning and Teaching Activity	Duration	Learning Mode
1	Introducing argumentative essays Brainstorming	<ul style="list-style-type: none"> ● Have students watch a video clip on how to construct an effective argument essay at https://www.youtube.com/watch?v=oAUKxr946SI&t=158s ● Give students time to brainstorm on given topics (e.g., Should cellphones be permitted in the classroom? Should the university impose curfew hours?) (activity created in Google Docs) ● Assign students to work in small groups and get them to practice the proposed topics (e.g., Should cellphones be permitted in classroom? Should the university impose curfew hours?) in Google Docs. Each group practices brainstorming for ideas. 	50 minutes	Small group collaboration
2	Converging on brainstorming	<ul style="list-style-type: none"> ● Explain the organization of an argument essay in a hamburger format <ul style="list-style-type: none"> - <i>Introduction</i> (the hook connecting information and a clear thesis statement - paragraph 1) - <i>Body paragraphs</i> (explanation sentence with supporting detail; summarize the situation in the text - paragraph 2) (textual evidence with supporting detail; use quotation or paraphrasing with citations that support argument - paragraph 3) (analysis of evidence with supporting detail; opposing viewpoint(s), counterargument and refutation - paragraph 4) - <i>Conclusion</i> 	50 minutes	Small group collaboration

Period	Activity	Learning and Teaching Activity	Duration	Learning Mode
		(restated thesis statement, suggestion/ opinion /prediction – paragraph 5) <i>*note: use “The Best Classroom” as a model</i>		
3	Learn from argumentation essay models	<ul style="list-style-type: none"> ● Give three model essays to students to analyze for their strengths and weaknesses: 1) “The best classroom” 2) “Teenagers and jobs” 3) “Once over lightly: Local TV news” from Folse & Pugh, 2019, pp.167-169; Langan & Albright, 2019, pp. 371-374]. ● Compare and justify the outline, thesis statement, supporting details and the concluding paragraph of each model essay (work in small groups). 	50 minutes	Small group collaboration
4-5	Outlining Drafting	<ul style="list-style-type: none"> ● Develop a clear direction in which the essay will discuss. The outline includes major sections and subsections. Information is based on brainstormed ideas or on the selected topic determined by the group. Outlining is done in Google Docs. ● Compose an argument essay (small groups of 3 may choose to divide the task or work together step by step depending on group consensus). 	100 minutes	Small group collaboration
6	Practice on division-classification checklist (the four bases: unity, support, coherence, and sentence skills)	<ul style="list-style-type: none"> ● Use an argument checklist (the four bases: unity, support, coherence, and sentence skills) to guide students to analyze each other’s language inputs that include content, organization, and language use in their group essay. ● Improve the quality of essay based on peer comments. 	50 minutes	Small group collaboration
7	Reviewing	<ul style="list-style-type: none"> ● Determine students’ roles as reviewer, editor, or proofreader, or everyone works together collaboratively to improve the essay content, organization, and language use which includes grammar, spelling, word choice, tense, and other mechanics. The reviewing process is done through web-based collaborative tool (Google Docs) by following the guideline for peer editing checklist. ● Evaluate the use of strategies for argument (e.g., using tactful or courteous language, acknowledging differing viewpoints, using counterargument and refutation). Analyze if these argument strategies are applied effectively or logically. 	50 minutes	Small group collaboration

Period	Activity	Learning and Teaching Activity	Duration	Learning Mode
		<ul style="list-style-type: none"> Give comments and feedback to improve the quality of essay (micro-level and macro-level) to students. 		
8	Revising Copyediting	<ul style="list-style-type: none"> Justify review comments by making incorporated changes in the draft based on suggestions. This includes adding words or sentence, removing irrelevant words or sentences, moving or changing a word or placement of a sentence, or even substituting words or sentences for new ones. The process of making final changes that are universally administered to a document to make a document more consistent (such as copy edits, grammar, logic) usually made by a dominant member in the group charged with this responsibility (Lowry et. al., 2004). 	50 minutes	Small group collaboration



APPENDIX L

Validation Form of Collaborative Writing Lesson Plans

The objective of this validation form is to assess the usefulness of lesson plans (Appendices I and J) used for the study which include the construct validity, relevance, and practicability.

Instructions: Please read the learning objectives of the lesson plans and put a tick (✓) in front of the statement 'Yes', 'No', or 'Not Sure'. If your answer is 'No' or 'Not Sure' please kindly give comments for improvement. (see also the course description and research objectives for your references in validating the lesson plans attached with this form).

Criteria	Answer and Comments
1. Do the lesson plans correspond to the learning objectives?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure Comments: _____ _____
2. Do the supplementary sheets/ activities correspond to the lesson plans?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure Comments: _____ _____
3. Are the model essays used to accommodate the lessons appropriate to the level of learners?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure Comments: _____ _____
4. Are the model essay topics useful for learners to practice writing descriptive and argument essays?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure Comments: _____ _____

Criteria	Answer and Comments
5. Are the instructions of learning and teaching activities listed in the lesson plans clear and comprehensible?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure Comments: _____ _____
6. Are the allotted hours for each lesson plan appropriate for learners to practice writing descriptive and argument essays?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure Comments: _____ _____
7. Are the learning objectives outlined in the lesson plans measurable?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Sure Comments: _____ _____

Note: ENGL 111 English composition Course Description and Learning Objectives

Course Description

English composition I intends to equip students to think critically and write logically. Students learn to write essays using the four principles of unity, support, coherence, and sentence skills.

Objectives:

At the end of the course, the students should be able to:

1. Demonstrate an understanding of the fundamentals of an accurate sentence, paragraph, and essay structure
2. Develop grammatical accuracy to write clearly and effectively
3. Articulate an understanding of the basic principles of the four steps in the writing process: begin with a thesis, support the thesis with specific evidence, organize and connect the specific evidence, and revise and edit sentences

4. Edit, revise, and rewrite their essays using the four bases: unity, support, coherence, and sentence skills
5. Demonstrate the ability to write descriptive, narrative, expository and argumentative essays that are organized, clear, and accurate



APPENDIX M

IOC Analysis of Lesson Plans

The objective of this validation form is to assess the usefulness of lesson plans (Appendices I and J) used for the study which include the construct validity, relevance, and practicability.

Instructions: Please read the learning objectives of the lesson plans and put a tick (✓) in front of the statement ‘Yes’ = 1, ‘No’ = -1, or ‘Not Sure’ = 0. If your answer is ‘No’ or ‘Not Sure’ please kindly give comments for improvement.

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q1	+1	+1	+1	1.00	Good
Q2	+1	+1	+1	1.00	Good
Q3	+1	0	+1	0.67	Acceptable
Q4	+1	+1	+1	1.00	Good
Q5	+1	+1	+1	1.00	Good
Q6	+1	+1	+1	1.00	Good
Q7	+1	+1	+1	1.00	Good
Total	7	6	7	0.95	Good

Notes:

1. +1 = the item is congruent with the objective
2. -1 = the item is not congruent with the objective
3. 0 = uncertain about the item

The result of IOC:

$$(IOC = \sum R / N)$$

Number of item: 7

$$R = 7+6+7 = 20 \text{ (Scores from the experts)}$$

$$N = 3 \text{ (Number of experts)}$$

$$IOC = 20/3 = 6.67$$

$$\text{Percentage: } 6.67/7 \times 100\% = 95.28\%$$

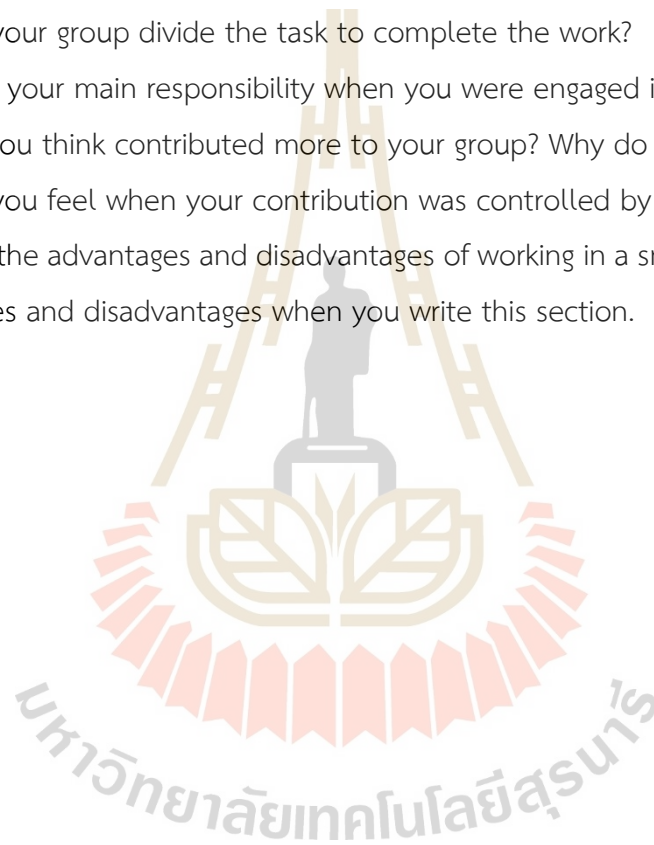
The analysis result of IOC for the collaborative lesson plans is 6.67, and the percentage is 95.28%, which is higher than 80%. This can be interpreted that the lesson plans are appropriate for adoption in the main study.

APPENDIX N

Guiding Questions for Reflective Journal

Instruction: Write to reflect your learning experience after participating in the collaborative writing (CW) task by responding to the guiding questions below.

1. How did you feel about working on Google Docs to complete your collaborative writing tasks?
2. How did your group divide the task to complete the work?
3. What was your main responsibility when you were engaged in the CW task?
4. Who do you think contributed more to your group? Why do you think so?
5. How did you feel when your contribution was controlled by DocuViz?
6. What are the advantages and disadvantages of working in a small group? Divide the advantages and disadvantages when you write this section.



APPENDIX O

IOC Analysis of Guiding Questions for Reflective Journal

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q1	0	+1	+1	0.67	Acceptable
Q2	+1	+1	+1	1.00	Good
Q3	+1	+1	+1	1.00	Good
Q4	+1	0	+1	0.67	Acceptable
Q5	+1	+1	+1	1.00	Good
Q6	+1	+1	+1	1.00	Good
Total	5	5	6	0.88	Good

- Notes:
1. +1 = the item is congruent with the objective
 2. -1 = the item is not congruent with the objective
 3. 0 = uncertain about the item

The result of IOC:

$$(IOC = \sum R / N)$$

Number of item: 6

R = 5+5+6 = 16 (Scores from the experts)

N = 3 (Number of experts)

$$IOC = 16/3 = 5.33 \quad \text{Percentage: } 5.33/6 \times 100\% = 88.88\%$$

The analysis result of IOC for the guiding questions for semi-structured interview is 5.33, and the percentage is 88.88%, which is higher than 80%. This can be interpreted that the guiding questions for reflective journal are appropriate for adoption in the main study.

APPENDIX P

Guiding Questions for Semi-structured Interviews

Interview: This study includes semi-structured interviews to triangulate data from CW tasks and students' reflective journals to further explore EFL learners' perceptions of their WBCW experiences in Google Docs.

- (1) Describe how you felt about your two collaborative writing tasks in Google docs: descriptive and argumentative essays.
- (2) How did your group divide up each task to work on?
- (3) What was your main responsibility when you were engaged in these two collaborative writing tasks?
- (4) What is your main goal/aim in the group writing tasks?
- (5) Were your contributions (ideas/opinions) valued by your team members? How?
- (6) Did you experience any conflicts while collaborating on the two CW tasks? What strategies did you use to resolve those conflicts?
- (7) How did you feel when your contribution was controlled by DocuViz (data visualization tool)?
- (8) What are the advantages and disadvantages of working in Google Docs?
- (9) What are the advantages and disadvantages of working in small groups?
- (10) How would you describe your overall impression of collaborative writing tasks in Google Docs?
- (11) How does your native language (L1) influence your writing in English?

APPENDIX Q

IOC Analysis of Guiding Questions for Semi-structured interviews

Item	Experts			IOC Value	Interpretation
	1	2	3		
Q1	0	+1	+1	0.67	Acceptable
Q2	+1	+1	+1	1.00	Good
Q3	+1	+1	+1	1.00	Good
Q4	+1	+1	+1	1.00	Good
Q5	+1	+1	0	0.67	Acceptable
Q6	+1	0	+1	0.67	Acceptable
Q7	+1	+1	+1	1.00	Good
Q8	+1	+1	+1	1.00	Good
Q9	+1	+1	+1	1.00	Good
Q10	+1	+1	+1	1.00	Good
Q11	+1	+1	+1	1.00	Good
Total	10	10	10	0.91	Good

Notes:

1. +1 = the item is congruent with the objective
2. -1 = the item is not congruent with the objective
3. 0 = uncertain about the item

The result of IOC:

$$(IOC = \sum R / N)$$

Number of item: 11

$$R = 10+10+10 = 30 \text{ (Scores from the experts)}$$

$$N = 3 \text{ (Number of experts)}$$

$$IOC = 30/3 = 10$$

$$\text{Percentage: } 10/11 \times 100\% = 90.90\%$$

The analysis result of IOC for the guiding questions for semi-structured interview is 10, and the percentage is 91%, which is higher than 80%. This can be interpreted that the guiding questions are appropriate for adoption in the main study.

APPENDIX R

List of Experts


Name	Position	Tasks
1. Dr. Suksan Supasetseree	-Unit Supervisor of the Foreign Language Resource Unit (FLRU), Suranaree University of Technology - Lecturer, Suranaree University of Technology	- Evaluating and validating pre-test and post-test writing topic - Evaluating and validating pre-task and post-task questionnaire - Evaluating and validating lesson plans for CW tasks - Evaluating and validating semi-structured interviews questions - Evaluating and validating guiding questions for reflection
2. Dr. Daron Benjamin Loo	- Lecturer, Centre for English Language Communication, National University of Singapore	- Evaluating and validating pre-test and post-test writing topic - Evaluating and validating pre-task and post-task questionnaire - Evaluating and validating lesson plans for CW tasks - Evaluating and validating semi-structured interview questions - Evaluating and validating guiding questions for reflection
3. Dr. Bienvisa Nebres	- Senior lecturer, Faculty of Arts and Humanities, Asia-Pacific International University	- Evaluating and validating lesson plans for CW tasks - Evaluating and validating pre-test and post-test writing topic - Grading learners' pre-test and post-test writing
4. Asst. Prof. Dr. Wayne Albert Hamra	- Principal lecturer, Faculty of Business Administration, Associate editor, Institute Press Asia-Pacific International University	- Assisting in statistical analysis - Proofreading the language

Name	Position	Tasks
5. Dr. Josephine Esther Katenga	- Chair for MEd. Faculty of Education and Psychology, Asia-Pacific International University	<ul style="list-style-type: none"> - Evaluating and validating pre-task and post-task questionnaire - Evaluating and validating semi-structured interview questions - Evaluating and validating guiding questions for reflection
6. Dr. Jebamani Anthony	- Chair for English-International Program, Faculty of Arts and Humanities, Asia-Pacific International University	<ul style="list-style-type: none"> - Evaluating and validating pre-test and post-test writing topic - Grading learners' pre-test and post-test writing



APPENDIX S

INFORMED CONSENT FORM

	<p>Suranaree University of Technology Institutional Ethics Committee</p>	<p>Informed Consent Form</p>
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1. TITLE OF STUDY

Effect of web-based collaborative writing on learners' writing performance and interactions in multilingual EFL classroom

2. PRINCIPAL INVESTIGATOR

Name: Nakhon Kitjaroonchai

Department: Institute of Social Technology

Address: School of Foreign Languages, Institute of Social Technology, Suranaree University of Technology

Phone: 064 214 7333

Email: (1) nakhon@apiu.edu (2) kit.nakhon77@gmail.com

3. PURPOSE OF STUDY

You are invited to consider participating in a research study. Before you decide to take part in this study, it is essential that you understand why the research is being done and what it will involve. Please kindly read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need further information.

The main purpose of this study is to examine the effect of collaborative writing tasks on writing performance of multilingual EFL learners at an international university. The study also aims to explore learners' collaborative writing and interaction patterns and the language functions employed by the group members as well as investigating their perceptions towards collaborative writing experiences.

4. STUDY PROCEDURES

Data will be mainly collected from (1) pre-task and post-task questionnaire surveys; (2) pre-test and post-test writing; (3) small group collaborative writing tasks; (4) student reflection; and (5) interview. The table below provides overall activities and time to be invested.

Activity	Length of time	Date	Venue
1. Pre-task questionnaire	15-20 minutes	2 nd week of research phase	Students can take this questionnaire online
2. Pre-test	60 minutes	2 nd week of research phase	In the classroom
3. Collaborative writing tasks	In a span of 3 weeks for each task	During the 4 th to 11 th weeks of research phase	Students can do collaborative tasks online
4. Student reflection	40-50 minutes	During the 12 th week of research phase	Student can write their reflection at their time of convenience
5. Post-task questionnaire	35-40 minutes	During the 12 th week of research phase	Students can take this questionnaire online
6. Post-test	60 minutes	During the 12 th week of research phase	In the classroom
7. Interview (audio-recorded)	35-40 minutes	During the 13 th to 14 th week of research phase	At student preference

5. RISKS

There are no known risks for participating in this research project. If you feel threatened or inconvenient while participating in the study, you may terminate your involvement at any time without penalty.

6. BENEFITS

There will be no direct benefit to you for your participation in this study. However, it is anticipated that the information obtained from this study will (1) help the English language teachers in developing English composition courses with the integration of technology to enhance writing skills; (2) promote collaboration and teamwork skills in acquiring English as a second or foreign language; and (3) raise awareness of the benefits of group work in a multicultural EFL classroom context.

7. CONFIDENTIALITY

All data of the research participants collected in this study will be kept strictly confidential and data will be used only for research purposes. All responses from the participants will be treated anonymously. The researchers will preserve all the participants' confidentiality, including the following:

- Assign code name / pseudo-name for participants throughout the research notes or documents
- Student reflections, interview transcriptions, and any other information given by the participants will be kept in the locked file cabinet and only the researchers can access to the data. The audio recorded interviews of the participants will be destroyed upon research completion.
- Keep all electronic data on a password-protected personal laptop, accessible only to the researchers. All saved file will be disposed securely upon research completion.

8. CONTACT INFORMATION

If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page, or contact the co-researcher (Dr. Suksan Suppasetseree) at phone number: 044-224533 or e-mail suksan@sut.ac.th If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Primary Investigator or the co-researcher, please contact Institutional Ethics, Suranaree University of Technology at 044-224757.

9. VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. The researcher will introduce the consent form to you during the first week of the semester. You will be given three days to decide if you want to participate in the study.

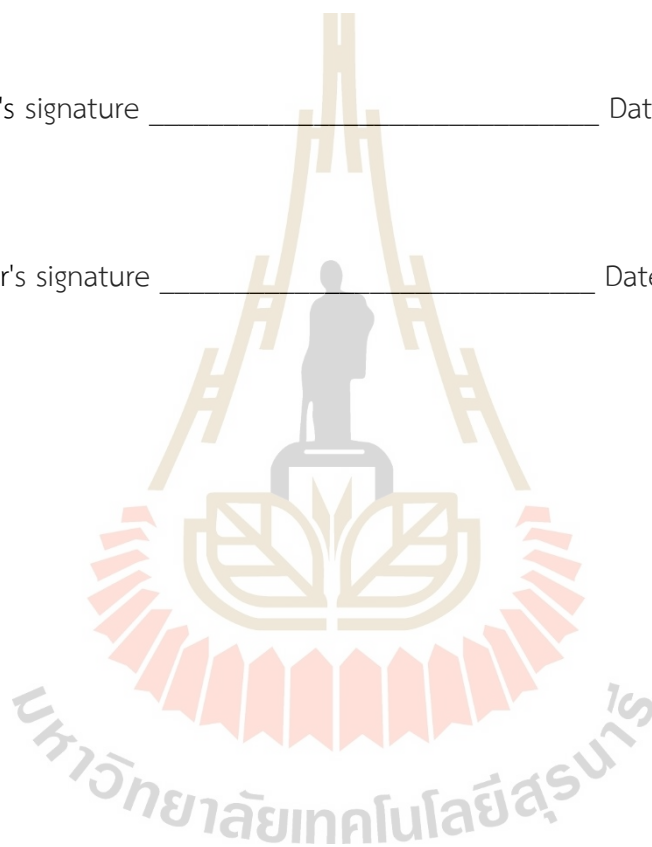
If you decide to take part in this study, you will be asked to sign a consent form. The research assistant from the Research and Development Office of Asia-Pacific International University will distribute the consent form to you. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT

I have read and I understand the provided information. I have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____



APPENDIX T

Pilot Study

1. Participants

The participants in the pilot study were 17 undergraduate students enrolling in the Applied Grammar and Academic Writing Class. Of these 17 participants, 10 were males and 7 were females who come from eight different countries in Asia, namely, Cambodia (1), China (2) Indonesia (1), Laos (3), Malaysia (1), Myanmar (1), Thailand (7), and Vietnam (1). They were divided into five small groups with three to four members in each group. Seven of these participants perceived their English was at the intermediate level, another seven considered it to be at the pre-intermediate level, and three viewed their English proficiency in the upper-intermediate level. Their years of learning English ranged from four to twelve years.

2. Data Collection

The pilot study was conducted during the first academic semester of 2019-2020 (August to November, 2019) spanning thirteen weeks. The researcher organized a research orientation in the first week and explained the nature of the study to the participants. Learners were formed in small groups in the second week, and pre-task questionnaire and pre-test writing were administered. Then, they were engaged in two CW tasks for a period of six weeks. After completing each task, they were asked to submit their reflections. The post-test writing was administered in week 12, followed by semi-structured interview in week 13. Table P1 portrays the timeline for data collection procedures for the pilot study.

Table P1. Timeline for Data Collection Procedures for Pilot Study

Week 1	Week 2	Week 3	Weeks 4-6	Weeks 7-10	Weeks 11-12	Week 13
Orientation of CW in Google Docs (17 students)	Pre-task questionnaire ; Pretest writing; Group formation (17 students – 5 groups)	Introduction to essay writing; Writing process (17 students – 5 groups)	CW task 1 (Descriptive Essay) Reflective journal 1 (5 groups)	CW task 2 (Argument Essay) (5 groups)	Reflective journal 2 Post-task questionnaire ; Posttest writing; (17 students – 5 groups)	Interview members in the chosen groups (2 groups – 6 students)

3. Data Analysis

For the quantitative data, learners' pre-and post-test writing were rated by three raters and the average scores were used and analyzed using a paired-sample *t*-test via IBM SPSS Statistics Version 20 to compare the means scores after engaging in two CW tasks. A descriptive analysis was used to analyze the post-task question items using percentages and mean scores.

For the qualitative data, including interviews and student reflections were analyzed qualitatively using content analysis that involved data preparation, open coding, recoding, and categorization.

4. Summary of Preliminary Results

4.1 Learners' Writing Performance Before and After Engaging in CW Tasks

Research Question 1 examined if CW tasks help to improve learners' writing performance in an argumentative essay. A clear-cut answer to this question is "yes" CW tasks could improve learners' writing performance. The findings of learners' overall writing performance are presented in Table P2.

Table P2. Results of Overall Writing Performance in Pre-test and Post-test

Writing Performance	N	M	SD	MD	<i>t</i>	df	<i>p</i>
Pre-test	17	57.82	9.31				
Post-test	17	68.99	7.78	11.17	-8.39	16	.000

**p* < .001 (2-tailed)

The results in Table P2 demonstrate that learners performed slightly better in their post-test than their pre-test [$t(16) = -8.39, p < .001$] The mean difference (MD) was 11.17 indicating a slight increase of mean scores in the post-test writing. From the standard deviation (SD), it can be implied that the post-test scores seemed to be slightly more homogenous than their pre-test scores although the difference is minimal. From the findings, it can be concluded that CW tasks could improve learners' writing performance at a certain level (MD = 11.17).

4.2 CW Styles of the Selected Subcases

To respond to Research Question 2: *What patterns of interaction occur when learners engage in a collaborative writing task via Google Docs?* the researcher employed DocuViz to analyze CW styles and interaction patterns in each collaborative task for the chosen groups. With the support of DocuViz, distinctive interaction patterns in each collaborative task were analyzed. The overall pictures of CW styles and interaction patterns of the selected cases: Groups 3 and 4 are displayed in Figures P1 – P4.

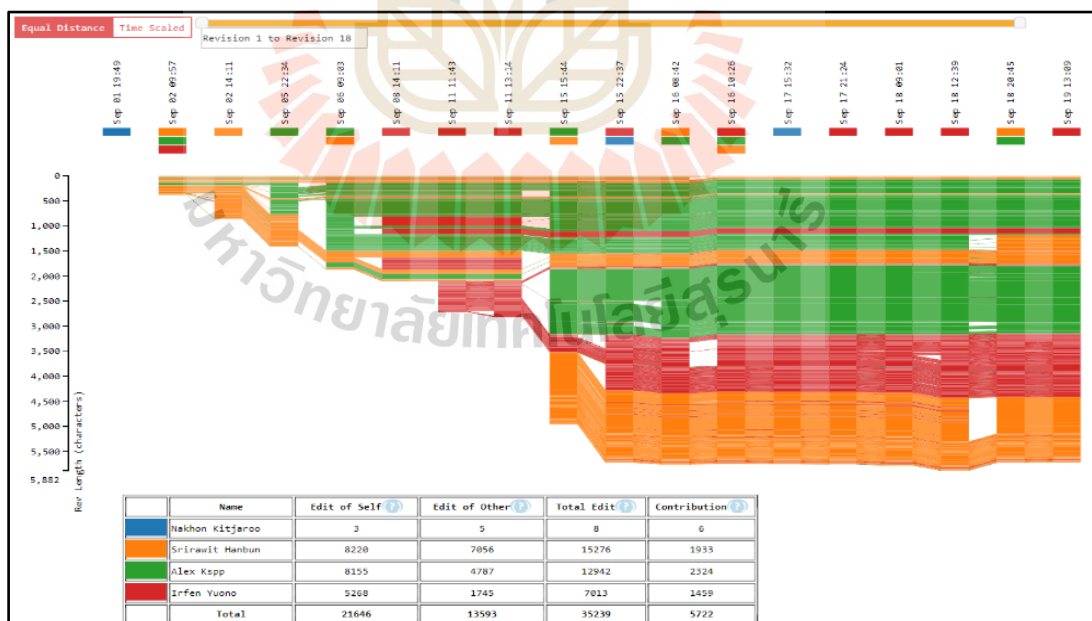


Figure P1. A Bar Chart Illustrating a Cooperative Revision Style (G.3-CW 1)

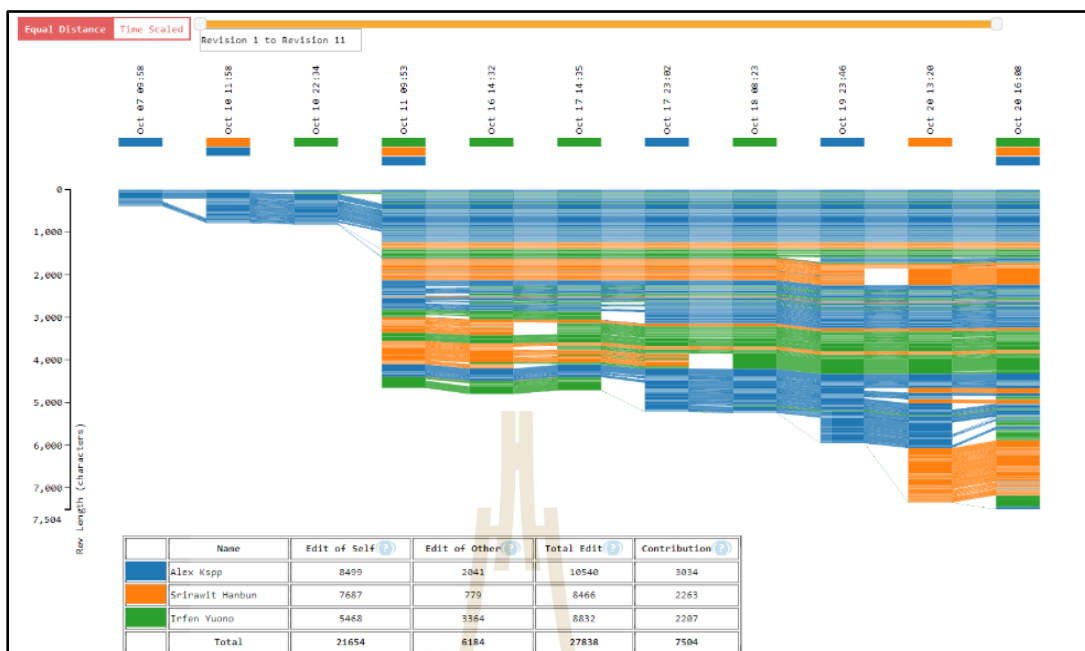


Figure P2. A Bar Chart Illustrating a Cooperative Revision Style (G. 3-CW 2)

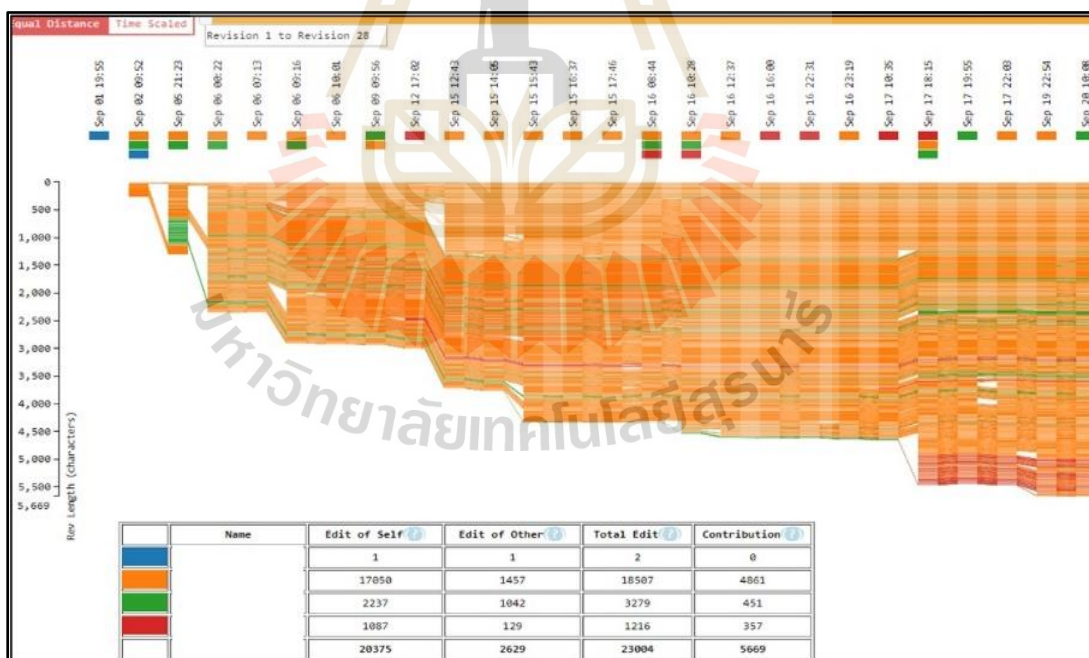


Figure P3. A Bar Chart Illustrating a Main Writer Style (G.4-CW 1)

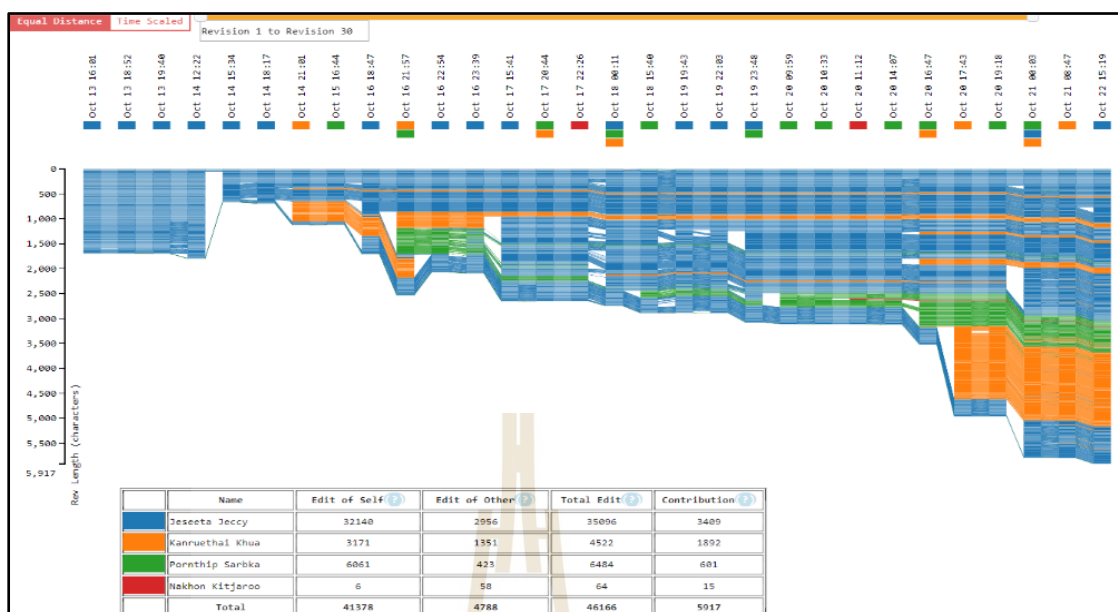


Figure P4. A Bar Chart Illustrating a Cooperative Revision Style (G. 4-CW 2)

The analysis from data visualization tool revealed that both Group 3 and Group 4 illustrated dynamic interactions while working to complete two tasks. Group 3 demonstrated a cooperative revision style (see Figures P1 and P2) in both tasks, whereas Group 4 demonstrated a main writer style in the first task (see Figure P3), but their writing behaviour shifted to a cooperative revision style on the second task (see Figure P4).

4.3 WCFs and LFs Employed by Group 3 and Group 4

To respond to Research Question 3, “*What are the WCFs and LFs used in CW when learners are engaged in writing tasks?*”, the researcher analyzed written texts co-constructed by the group members in GD files, and scanned through GD version history and comments window to observe WCFs and LFs used during the CW process. The findings from data analysis of WCFs and LFs employed by Groups 3 and 4 are shown in Tables P3 and P4.

Table P3. Writing Change Functions Performed by Groups 3 and 4

Writing Change Functions		Group 3								Group 4							
		Farel		Sak		Suwit		Total		Jannah		Phannee		Ruethai		Total	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Adding	Self	3	3	2	4	2	2	7	9	8	4	0	3	1	2	9	9
	Other	1	3	0	1	0	1	1	5	0	2	2	0	0	3	2	5
Correcting	Self	3	0	0	1	0	0	3	1	1	1	0	1	0	1	3	3
	Other	2	1	2	2	0	1	4	4	0	1	1	2	3	2	4	5
Deleting	Self	1	1	1	1	2	1	4	3	2	1	0	1	0	0	2	2
	Other	0	0	0	1	0	0	0	1	1	3	0	0	0	0	1	3
Reordering	Self	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1
	Other	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Rephrasing	Self	1	0	3	1	2	0	6	1	7	2	0	0	0	0	7	2
	Other	0	2	1	0	0	0	1	2	1	1	1	0	0	0	2	1
Total		11	11	9	11	6	5	26	27	20	17	4	7	4	8	28	32

* T1 = Task 1, T2 =Task 2

Group 3 produced a total of 26 WCFs in the first task and 27 in the second task, which is relatively similar. The most frequently writing change act produced by the group was adding (26.4%), whereas the least employed writing change act was reordering (1.8%).

Like wise, Group 4 employed some WCFs in both tasks. The team produced 60 writing change acts from both tasks combined. The most frequently writing change act produced by the group were adding (41.6%) followed by correcting (21.6%). The least used writing change act was reordering (3.3%).

As for LFs, they were retrieved from the comment history recorded in the GD file. However, the data showed that both groups employed unvarying LFs in negotiating with each other on their group tasks. The analysis of frequency of LFs produced by Group 3 and Group 4 are illustrated in Table P4.

Table P4. Frequency of Language Functions Produced by Groups 3 and 4

Language Functions	Group 3								Group 4							
	Farel		Sak		Suwit		Total		Jannah		Phanee		Ruethai		Total	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
Eliciting	0	2	0	0	0	0	0	2	1	1	0	0	0	0	1	1
Greeting	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Justifying	1	0	0	0	0	1	1	1	0	0	0	0	0	1	0	1
Initiating	0	1	0	0	0	1	0	2	0	1	0	1	0	1	0	3
Requesting	0	1	3	0	0	0	3	1	2	0	0	0	0	0	2	0
Stating	0	0	0	0	0	0	0	0	2	2	0	0	0	1	2	3
Suggesting	3	2	0	0	3	0	6	2	0	1	0	4	0	2	0	7
Acknowledging	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0
Responding	1	0	1	2	2	0	4	2	0	4	1	1	0	1	1	6
Disagreeing	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Elaborating	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1
Total	5	7	4	5	5	2	14	14	5	11	1	6	0	6	6	23

As seen from Table P4, the most frequently used LFs were suggesting, followed by agreeing in responding category. Based on the employment of LFs we may infer that Group 3 illustrated some “equality” and “mutuality” as evidenced by their use of WCFs and LFs in negotiating with one another in both tasks. On the other hand, Group 4 performed a slight difference of interaction. In Task 1, the members showed inequality in contribution as evidenced by their use of WCFs (Table P3). The team also lacked mutuality in Task 1 when the members produced only five initiating LFs by one person but received only one responding act (see Table P4). However, the team evidently improved their interaction and negotiation in Task 2.

4.4 Learners’ Perceptions of CW Tasks in GD

Research Question 4 explored the learners’ perceptions of WBCW experiences in GD. The researcher modified 21 questionnaire items developed by Li (2014). The preliminary findings from questionnaire items are summarized in Table P5.

Table P5. Percentage of Learners' Perception on CW Tasks in GD (N=17)

Statement(s)	(5)	(4)	(3)	(2)	(1)	M	SD	Level of Perception
1. Google Docs is a useful tool for collaborative writing tasks.	17.6	82.4	0.0	0.0	0.0	4.18	0.39	High
2. I enjoyed working on Google Docs for collaborative writing tasks.	11.8	70.6	17.6	0.0	0.0	3.94	0.56	High
3. My experience with collaborative writing tasks via Google Docs is positive.	11.8	70.6	17.6	0.0	0.0	3.94	0.56	High
4. I could contribute to my group when I use Google Docs.	0.0	64.7	29.4	5.9	0.0	3.59	0.62	High
5. I used the 'History' module in Google Docs to view changes before I revised or edited the writing task.	5.9	52.9	41.2	0.0	0.0	3.65	0.61	High
6. My group members and I rarely interacted in Google Docs but used other social media platforms (e.g., Facebook, Line, emails, etc.) to discuss the group task.	11.8	52.9	29.4	5.9	0.0	3.71	0.77	High
7. Collaborative writing tasks in Google Docs can improve my writing skills.	17.6	70.6	11.8	0.0	0.0	4.06	0.56	High
8. I like collaborative writing tasks in Google Docs because it has a positive impact on writing quality.	11.8	52.9	35.3	0.0	0.0	3.76	0.66	High
9. Collaborative writing tasks in Google Docs help me pay attention to the use of language.	5.9	70.6	23.5	0.0	0.0	3.82	0.53	High
10. Collaborative writing tasks in Google Docs can easily develop essay content, structure, and organization.	5.9	70.6	23.5	0.0	0.0	3.82	0.53	High
11. Collaborative writing tasks in Google Docs can improve the quality of group work.	5.9	58.8	29.4	5.9	0.0	3.65	0.7	High
12. I perceived that the revision process improves the quality of writing.	11.8	47.0	41.2	0.0	0.0	3.71	0.69	High
13. Collaborative writing tasks in Google Docs promote interaction and group achievement.	0.0	64.7	35.3	0.0	0.0	3.65	0.49	High

Statement(s)	(5)	(4)	(3)	(2)	(1)	M	SD	Level of Perception
14. Collaborative writing tasks in Google Docs promote interaction between members in the group.	0.0	76.5	23.5	0.0	0.0	3.76	0.44	High
15. Collaborative writing tasks in Google Docs promote learning-friendly environment.	11.8	52.9	29.4	5.9	0.0	3.71	0.77	High
16. My group partners valued my contributions in the collaborative writing tasks.	17.6	52.9	23.5	5.9	0.0	3.82	0.81	High
17. The members in my group interacted positively to the collaborative writing tasks.	5.9	58.8	29.4	5.9	0.0	3.65	0.7	High
18. DocuViz embedded in Google Docs raised awareness of member participation.	11.8	64.7	23.5	0.0	0.0	3.88	0.6	High
19. DocuViz embedded in Google Docs helped me monitor my contribution.	11.8	47.0	41.2	0.0	0.0	3.71	0.69	High
20. DocuViz is a useful tool to encourage group members' equal participation.	11.8	76.5	5.9	5.9	0.0	3.94	0.66	High
21. Docuviz helps monitor group members' participation to reach consensus on the final draft.	17.6	52.9	23.5	0.0	5.9	3.76	0.79	High

The findings revealed that all learners (100%) agreed and strongly agreed that GD was a useful tool for CW tasks ($M=4.18$; $SD=0.39$). Over 82% enjoyed working on GD for group work and perceived their learning experiences in GD was positive ($M=3.94$; $SD=0.56$). About 65% stated that they could contribute to their group when they used GD ($M=3.59$; $SD=0.62$). Interestingly, while performing group tasks, learners would rather use other social media platforms to discuss their group work. As seen in item 6, about 65% agreed and strongly agreed that they rarely used the chat box in GD to interact with the members, but rather used other social media platforms such as Facebook or Line ($M=3.71$; $SD=0.77$) to follow up the work. About 88% of learners agreed and strongly agreed that CW tasks in GD could

enhance their writing skills ($M=4.06$; $SD=0.56$) (see item 7). Over three quarters of them ($M=3.82$; $SD=0.53$) perceived CW tasks in GD could help them pay attention to the use of language (see item 9) and develop essay content, structure, and organization (item 10). About 65% agreed and strongly agreed that CW tasks in GD could improve the quality of group work, whereas over a quarter of them were unsure about it (see item 11). Learners (58.8%) perceived revision process can improve writing quality, while 41.2% were not sure about this (item 12). Most (76.5%) agreed that CW tasks in GD promoted interaction among group members ($MD=3.76$; $SD=0.44$), whereas nearly a quarter were unsure about this (item 14). About 65% agreed and strongly agreed that CW tasks in GD promoted a learning environment ($MD=3.71$; $SD=0.77$), whereas over a quarter of them showed neutral perception on this (item 15). Participants (70.5%) agreed and strongly agreed that their writing contributions were valued by their team members ($M=3.82$; $SD=0.81$), while nearly a quarter were unsure if their peers valued their contributions (see item 16). Overall, the findings imply that the majority of the participants perceived having “high” levels of perceptions on usefulness of CW tasks in GD. The agreement levels for perceived usefulness of GD and CW tasks in GD can be summarized in Figure P5.

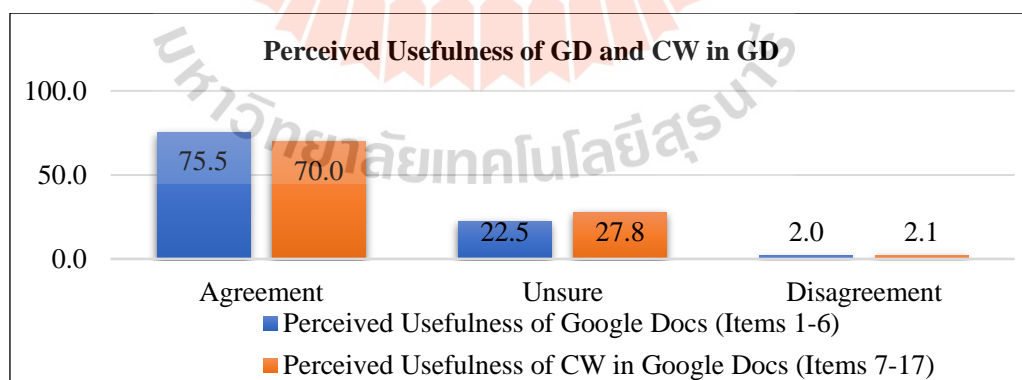


Figure P5. Agreement Level for Perceived Usefulness of GD and CW in GD

As the overall, learners’ perceived usefulness of GD was mostly at the ‘agree’ level (75.5%), whereas less than a quarter reported their uncertainty and

disagreement. Likewise, the percentage of average agreement level on perceived usefulness of CW in GD was higher (70%) than those who were unsure about its usefulness (27.8%). This can be inferred that most learners perceived that GD is useful for CW tasks.

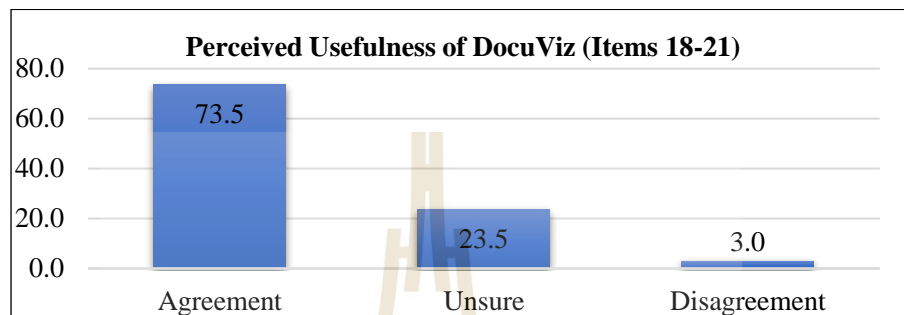


Figure P6. Agreement Level for Perceived Usefulness of DocuViz

The researcher employed DocuViz to monitor learners' contributions and to promote accountability as well as raise awareness of participation in the CW tasks. Four items related to the use of DocuViz were included in the post-task questionnaire (see items 18-21). The findings of perceived usefulness of DocuViz can be summarized in Figure P6.

As shown, learners' perceived usefulness of DocuViz was mostly at the 'agree' level (73.5%), whereas 23.5% were uncertain about it, and only 3% disagreed. This can be inferred that in general, learners reported having "high" levels of perceptions that DocuViz could raise awareness of member participation, monitor members' contributions, and encourage the team to participate in group writing.

The findings reported above were based on 17 students who volunteered to take part in the pilot study. The researcher took notes of some limitations, including group formation, CW activities in GD, group interactions, and use of visualization tool to observe learners' CW behaviours. Therefore, improvement plans were drafted and implemented in the main study. Problems encountered and implications for the main study were reported in Chapter 3.

CURRICULUM VITAE

Nakhon Kitjaroonchai was born on November 17, 1977 in Chiang Mai Province, Thailand. He received his Bachelor of Arts in English (First Class Honors) from Mission College, Thailand in 2000. He obtained his Master of Education in Teaching English as a Foreign Language (TEFL) from Chiang Mai University, Thailand in 2006.

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From 2017-2021, he was granted a full scholarship from Asia-Pacific International University (AIU) to pursue his Ph.D. in English Language Studies at the School of Foreign Languages, Suranaree University of Technology, Thailand. His research interests include collaborative writing in L2 context, L2 writing, English language learning motivation, and technology-enhanced language learning.

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