

**The Impact of Google Docs-mediated Collaborative  
Writing with Teacher Intervention on EFL Learners'  
Writing Outcomes**

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**December 2023**

## **Abstract**

Several online collaborative writing studies have demonstrated that Web 2.0 tools such as Google Docs (GD) can facilitate student collaboration. However, these studies show that some students were reluctant to collaborate or split the work, which may explain why the impact of online collaborative writing on writing outcomes remains inconclusive. Some studies advocate teacher intervention in online collaboration; in most, teachers' online interventions are shown to promote student collaboration but none have examined whether such interventions improve students' writing abilities. Therefore, this study aims to investigate the impact of GD-mediated collaborative writing (GMCW) with teacher intervention on learners' writing outcomes, their level of collaboration, and their attitudes to provide a comprehensive picture of the impact of the intervention. An experimental study design was used, with 46 EFL students enrolled at Level 3 in the Department of English Language at Al Qassim University, Saudi Arabia. Convenience sampling was employed to assign learners to two conditions: experimental (n=24) and control (n=22). The experimental condition involved learners participating in GMCW activities with teacher intervention while the control condition involved learners participating in GMCW activities without teacher intervention. The study was conducted for 14 weeks. Unlike previous research, a mixed-methods approach was used to evaluate learners' writing outcomes and their collaboration process in GD, as well as their attitudes.

The results indicated that promoting learners' collaboration and influencing their language-learning beliefs through teacher intervention in the experimental condition resulted in learners improving their writing outcomes significantly more than those in the control condition. In experimental conditions, learners demonstrated high levels of collaboration by

engaging in *collaborative*, *collaborative/passive*, and *expert/novice* interaction patterns. They also viewed the activities as a means of language learning. Those in the control condition showed low collaboration levels by following a *cooperative/passive* pattern. Furthermore, their prior language learning beliefs negatively affected their attitudes toward the activity.

This thesis argues that learners' writing outcomes and attitudes toward collaboration are related to their collaboration level. Further, this study indicates that advanced collaborative platforms such as GD cannot facilitate learners' collaboration without teacher support. Teachers should intervene to promote students' online collaboration, which in turn improves their writing skills.

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## **Acknowledgements**

Primarily, I am grateful to Allah the Almighty for his endless support and assistance, without which I would not have completed this thesis. I would also like to thank all those people who have supported and inspired me during my journey toward obtaining my PhD. I want to express my deep appreciation for the guidance, encouragement and advice offered by my thesis supervisor, Dr Khaled El Ebyary. I am also indebted to my Thesis Advisory Panel member (TAP) Dr Zoe Handley for her insightful comments, thoughtful inquiries, and patience during the TAP meetings.

In addition, I would like to express my deepest gratitude to my father, who passed away before I completed my PhD study. Your confidence in my capabilities has greatly supported and encouraged me from my childhood through to this point in my life. If I forget anyone, I will not forget to thank my mother for enlightening my path through her prayerful supplications. My great husband Dr Khaled Albeshir is owed a deep debt of gratitude. Thank you for being my teacher, my helper, and my supporter. Through your lessons and advice, I was able to succeed in my academic endeavors. My sincere thanks go to my lovely children, who are the joy of my life, for their patience and kindness during my studies. I would like to extend my deepest gratitude and thanks to all my sisters and brothers for their love and support. In particular, my sincere appreciation goes out to my youngest sister Manahel, for her sincere prayers and caring.

In addition, I would like to take this opportunity to thank my dear friend Huda Al-Mushaiqh for listening to my complaints and offering me her support and encouragement.

Finally, I would like to express my gratitude to both students and teachers in the English Language Department at Al-Qassim University for their participation in my study. Because of your contributions, I have been able to present this work with a high level of knowledge.

## **Dedication**

This thesis is dedicated to my beloved parents and children for their unconditional love, support, and encouragement.

## **Author's Declaration**

I, Manal Alharee, declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as references. The work in this thesis has not previously been published.

# **Chapter 1 Introduction**

## **1.1 Rationale**

Collaborative writing involves two or more individuals working together to produce a text. It has been seen as an effective method for students to learn a second or foreign language (SL or FL) (Storch, 2013). In both learning and writing in a second language (L2), collaborative writing has significant advantages over solitary writing (e.g., Storch, 1999, 2005; Storch & Wigglesworth, 2007; Kim, 2008; Fernandez Dobao, 2012; Shehadeh, 2011; Bikowski & Vithanage, 2016; Strobl, 2014). Several studies on collaborative writing activities in face-to-face (FTF) settings have found that collaborative writing activities facilitate learners' collaboration by allowing them to interact with each other in their L2 and to identify language gaps, enabling them to participate in a collaborative dialogue to share their ideas and thoughts, as well as build a body of language knowledge beyond the abilities of each individual (Swain & Lapkin, 1998; Swain, 2000, 2006; Brooks & Swain, 2009; Swain & Watanabe 2013). In addition, it has been reported by studies that investigated the outcomes of collaborative writing that engagement in this activity leads to L2 learning and promotes the development of L2 writing abilities by improving the quality of the final text (e.g., Storch, 1999; Malmqvist, 2005; Storch, 2005; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009; Fernandez Dobao, 2012), by enhancing language acquisition (Kim, 2008; Kuiken & Vedder, 2002; Nassaji & Tian, 2010; Swain & Lapkin, 1998; Swain, 1998; Storch, 2002), or by developing individual writing performance (Shehadeh, 2011).

With the rapid development of technology and the appearance of Web 2.0 applications, online collaborative writing research has grown rapidly. Web 2.0 platforms such as Google

Docs (GD) and Wikis are the most appropriate technology for collaborative writing, since they allow writers to collaborate in all stages of text creation (Storch, 2013). Moreover, the logs of these applications provide evidence of each participant's contributions, recording editing behaviours, discussions and writing which help researchers and teachers to assessing the collaborative writing activity (Storch, 2011; Abrams, 2016; Kessler & Bikowski, 2012). Collaborative writing using Web 2.0 tools has been reported to yield positive results in many studies. For example, studies provided sufficient evidence that these tools promote learners' interactions in discussion mode by enabling learners to engage in collaborative dialogue while deliberating over the task (e.g., Arnold et al., 2009; Elola & Oskoz, 2010; Bradley et al., 2011; Lee, 2010; Li & Zhu, 2011; Li, 2013; Alghasab, 2015; Alkhateeb, 2020; Alharbi 2019; Elabdali & Arnold, 2020), and by facilitating learners' revision processes (e.g., Kost, 2011; Arnold et al., 2009, 2012; Kessler, 2009; Kessler & Bikowski, 2010; Abrams, 2016; Lawrence & Lee, 2017; Woo et al., 2011, 2013; Elola & Oskoz, 2010; Oskoz & Elola, 2014; Elabdali & Arnold, 2020; Kessler et al., 2012; Alharbi, 2019; Alkhateeb, 2020). In addition, some studies have reported that mediated collaborative writing activities involving Web 2.0 tools enabled learners to produce high-quality collaborative texts (Strobl, 2014; Abrams, 2019; Kuteeva, 2011; Li & Zhu, 2017; Elabdali & Arnold, 2020) and to develop their writing performance (Bikowski & Vithanage, 2016).

However, Storch (2001, 2002) provided convincing evidence from the FTF context that simply grouping students together cannot ensure effective collaboration. Students may not collaborate and may not engage in the *collaborative* pattern or the *expert/novice* pattern in which they interact mutually and exchange reciprocal feedback that leads to language learning; alternatively, they may adopt non-collaborative patterns, such as *cooperative*, in which students work independently without interacting, or *dominant/passive*, where one student assumes authority and the other remains inactive.



In online collaborative writing, researchers also agree that some learners may not collaborate despite the significant impact of Web 2.0 tools (e.g., Arnold et al., 2009, 2012; Kessler, 2009; Kessler & Bikowski, 2010; Abrams, 2016; Li & Zhu, 2011; Li, 2013; Bradley et al., 2010; Alghasab, 2015; Alkhateeb, 2020; Kitjaroonchai & Suppasetsere, 2021; Elabdali & Arnold, 2020). Students have been reported to be reluctant to participate (e.g., Kessler, 2009; Kessler & Bikowski, 2010, Bradley et al., 2010; Abrams, 2016), or to remain inactive by assuming the roles of *social loafers*, in which they are not contributing their fair share, or *free riders*, in which they rely on others to complete the task (e.g., Arnold, Ducate, Lomicka et al., 2009, 2012). Other studies have found that students choose to cooperate by contributing equally to an activity without engaging in mutually beneficial collaboration (e.g., Alghasab, 2015; Arnold et al., 2012; Li & Zhu, 2011; Alkhateeb, 2020; Elabdali & Arnold, 2020; Kost, 2011; Bradley et al., 2010; Abrams, 2016). Some studies also found that students are more likely to take an authoritative and leading role and reject other contributions (e.g., Li & Zhu, 2011; Alkhateeb, 2020; Elabdali & Arnold, 2020; Kitjaroonchai & Suppasetseree, 2021).

According to Storch (2013, 2018), mixed results obtained by the studies regarding the effect of collaborative writing on improving learners' outcomes may be explained by the fact that not all students engage in a collaborative manner while completing a collaborative task. Although studies comparing the texts produced by learners who write independently with those produced by learners who write collaboratively in the FTF context revealed that joint texts were better and more grammatically accurate than individual texts (e.g., Fernandez Dobao, 2012; Wigglesworth & Storch, 2009; Storch, 2002, 2005), studies aiming to find evidence of language learning in subsequent individual performance offer inconclusive findings. Some studies (e.g., Kim, 2008; Shehadeh, 2011) have shown significant improvement; other studies (e.g., Kuiken & Vedder, 2002) that measured the effects of one collaborative writing activity found no improvement. Similarly, in the online context, some

studies reported that collaboration during collaborative writing activities using Web 2.0 tools impacts learners' outcomes only in terms of the structure and development of ideas (e.g., Strobl, 2014; Abrams, 2019; Kuteeva, 2011; Li & Zhu, 2017; Bikowski & Vithanage, 2016; Elabdali & Arnold, 2020) – whereas some of them found no evidence of the impact of collaboration in all aspects of writing (e.g., Elola & Oskoz, 2010; Alkhateeb, 2020).

Several factors have been found to influence learners' levels of collaboration. Among these factors are the type of task to be performed (Aydin & Yildiz, 2014; Lee, 2010; Abrams, 2016, 2019; Li & Kim, 2016), group size and formation (Lee, 2010; Kessler, 2009; Arnold et al., 2009); technological purpose (Alharbi, 2019; Abrams, 2016, 2019; Kessler et al., 2012; Strobl, 2014); contextual factors such as sociocultural and institutional factors (Arnold et al., 2012; Lee, 2010; Alghasab, 2015); and the teacher's presence or intervention, which is the focus of this study (Arnold et al., 2012; Alghasab, 2015; Woo et al., 2013). Studies that have examined learners' collaborations during teacher presence have found that even in online collaborative writing, which is considered student centred, teachers play a vital role in fostering collaboration between learners (Alghasab, 2015; Woo et al., 2013; Arnold et al., 2012). However, these studies reported that teachers may hinder rather than promote collaboration (Arnold et al., 2012) if the teachers do not intervene in a non-authoritative and collaborative manner (Alghasab, 2015). Despite the useful findings provided by these studies, particularly by Alghasab (2015), where the researcher examined not only students' but also teachers' collaborative and non-collaborative behaviour, the researcher did not show whether teacher intervention influences students' writing outcomes.

From a sociocultural theory (SCT) perspective, the importance of collaboration is not restricted to enabling learners to complete difficult tasks through reliance on each other's knowledge; rather, its importance lies in its role in the process of constructing new knowledge and the ability to achieve similar tasks independently in the future. Arguably, if a

teacher can promote learners' collaboration and help them engage in collaborative dialogue that involves mutual interaction and instances of co-constructing knowledge, learners will improve their writing outcomes in subsequent individual performance.

## **1.2 Research objectives and questions**

The purpose of this thesis is to address the literature gap pertaining to the effect of Google Docs mediated collaborative writing (GMCW) with teacher intervention on improving learners' writing outcomes of English as a foreign language (EFL). In other words, it seeks to determine whether the impact of GMCW with teacher intervention on promoting learners' collaboration and improving their outcomes would be more effective than using GMCW without teacher intervention. More specifically, it aims to provide an opportunity for Saudi EFL students to engage in GMCW activities to help them improve their L2 writing abilities as well as their L2 more broadly. It should be noted that the teacher's role in this study is to motivate and guide students to engage in effective interactions. This can be accomplished through collaborative intervention strategies such as encouraging students to exchange feedback, stimulating their responses, creating a supportive and non-threatening environment, and allowing students to interact with each other by minimizing authority (for more information see Appendices C and E).

For the purpose of achieving the overarching aim, there are three objectives that must be examined between the two conditions (GMCW without teacher intervention versus GMCW with teacher intervention): learners' writing outcomes before and after the intervention; the level of student collaboration in both modes of interaction, namely the GD comments page in discussion mode and revision behaviours in text mode; and learners' attitudes toward GMCW activities. To achieve this comparison, a mixed-methods study was used, employing pre- and post-tests, tracking students' collaboration processes in both modes of GD interaction, and

semi-structured interviews. There are four main research questions that can be derived from this purpose:

1. Will Saudi university EFL students who are engaged in GMCW with teacher intervention improve their writing outcomes in subsequent individual performance more than those who are engaged in GMCW without teacher intervention?
2. To what extent do Saudi EFL students collaborate when they engage in GMCW with teacher intervention, compared with those who collaborate in GMCW without teacher intervention?
3. Do differences in learners' patterns of interaction result in different writing outcomes?
4. What are students' perceptions of GMCW in the groups that have teacher intervention, compared to the groups that do not have such intervention?

### **1.3 Significance of the study**

The current study is significant both theoretically and pedagogically. According to the study's theoretical framework (SCT), social interaction offers an excellent opportunity for language learning. Many studies have supported this claim by exploring the impact of learners' interaction during collaborative writing on the improvement of their language learning. However, it has been found that simply grouping students to collaborate does not guarantee successful collaboration. Therefore, some researchers argue that teachers play a critical role in promoting learners' collaboration, even in learner-centered approaches like collaborative writing. Although some studies have examined the role of teachers in promoting learners' interaction during collaborative writing activities, none of them have investigated whether teacher intervention contributes to improved language gains (Alghasab, 2015; Arnold et al., 2012; Woo et al., 2013). Therefore, this study adds to the body of knowledge from a theoretical standpoint by demonstrating that teacher intervention in

GMCW can have a significant impact on students' collaboration, language learning and writing outcomes.

Having taught writing skills at Al Qassim University for many years, the researcher has observed that EFL students generally fail to meet the intended target for English writing assessments. As a result, the researcher believes that the empirical findings of this study have pedagogical significance, demonstrating that ESL/EFL teachers can play an important role in shaping language-learning processes during online collaborations and improving learners' writing skills.

This study also contributes methodologically. The impact of collaborative writing activities on learners' writing outcomes is related to the level of collaboration, as discussed in chapters 2 and 5. Storch (2013) calls for studies that investigate both learners' collaboration processes and writing outcomes, as well as learners' attitudes, to provide a complete picture of the impact of collaborative writing on learners' outcomes. To the best knowledge of this researcher, all studies that examine learners' outcomes, particularly those seeking evidence of learning in subsequent performance, have focused solely on the product, with no analysis of the process. As a result, this study responds to this call by conducting a broad examination of the impact of collaborative writing on learner outcomes that also investigates the level of collaboration and attitudes to provide a complete picture. Furthermore, the current thesis is unique in that it employs a mixed-methods approach, in which data collected from various sources is analysed quantitatively (pre- and post-test written tasks, as well as frequency counts (the number of times students engaged in the collaborative process) and qualitatively (extracts of students' interaction and learners' interviews).

## 1.4 Structure

The thesis is divided into six chapters. Following this introduction, the remainder of the thesis is organised as follows:

In Chapter 2, the theoretical foundation of the study is introduced, namely SCT, which is presented as a theoretical framework for understanding language classroom interaction (2.2). Among the implications of this theory is the facilitation of social interaction between students through collaborative activities. Consequently, section 2.3 aims to define and differentiate collaboration from other forms of interaction. Writing activities are presented as a context for collaboration throughout this chapter. Particular focus is placed in section 2.4 on the process writing approach, which emphasises peer feedback and collaborative writing activities. Additionally, this section clearly defines collaborative writing activity and highlights the patterns of interaction involved in collaborative writing. Section 2.5 presents FTF collaborative writing in L2 classrooms and a review of empirical research demonstrating the impact of such activities on language learning (2.5.1), as well as the factors that facilitate or hinder FTF collaborative writing (2.5.2). Online collaborative writing is presented in section 2.6, which discusses previous research findings and focuses on studies involving Web 2.0 tools in relation to students' collaboration processes in both modes of interaction offered by these tools, as well as their outcomes (sections 2.6.1, 2.6.2 and 2.6.3). The chapter then discusses the factors that influence students' collaboration processes in Web 2.0-based collaborative writing activities, with a focus on teachers' online interventions as a factor that promotes students' collaboration processes. Furthermore, this section identifies a gap in the literature and makes the case that if learners collaborate with teacher intervention, they are more likely to engage in language learning and perform better in subsequent performances. Section 2.7 discusses the role of teacher intervention in promoting students' collaboration and

highlights collaborative and non-collaborative behaviour of teachers, building on previous research about how teachers should intervene.

In Chapter 3, the method used to answer the research questions and reach the goal of the research is explained. Sections 3.2 and 3.3 discuss the current study's research paradigm and strategy, as well as the rationale for using a mixed-methods approach. Participants and the sampling procedure for the study are described in section 3.4. The chapter also presents the study design (section 3.5), the materials and instruments used for data collection (section 3.6) and the procedures employed in the main study (section 3.7). Data analysis and the analysis process for each method used to collect data are described in section 3.8. Then, the pilot study is presented (3.9). The remaining section of the chapter discuss ethical considerations, reliability and validity (section 3.10).

In Chapter 4, the performance of the participants is shown in four sections based on the outcomes measured in this study. The results of writing completion are provided in section 4.2. The results of the GD-collaboration process are presented in section 4.3. Section 4.4 investigates whether the differences in learners' patterns of interaction result in different outcomes. Section 4.5 discusses the interview results.

The purpose of Chapter 5 is to discuss the findings reported in Chapter 4. The chapter begins by summarising the main findings of this study. The discussion is then presented in relation to the three aspects addressed in the current study: collaboration, outcomes and attitudes.

## **Chapter 2 Literature Review**

### **2.1 Overview**

Since the aim of the present study is to investigate the effect of GMCW with teacher intervention on EFL students' writing outcomes by comparing empirically between the GMCW with and without teacher intervention on improving learners' writing outcomes in subsequent individual performance, this chapter first discusses and focuses on SCT to provide a theoretical background for the current study, emphasising the importance of social interaction in language learning (section 2.2). The definition of collaborative learning (CL) adopted in the present study, which includes a high degree of interaction and contribution, is then presented in section 2.3.

This is followed by a discussion of collaborative writing as an activity that is effective in promoting collaboration and improving learners' writing abilities (section 2.4); this discussion focuses on the process approach to writing as a pedagogical approach that supports the use of collaborative writing through its emphasis on peer response activity (section 2.4.1). A definition of collaborative writing activity, showing how it differs from other group writing activities, is also provided in this discussion (section 2.4.2). The discussion also includes how collaboration should take place in a writing activity (section 2.4.3). Following this, section 2.5 discusses collaborative writing in L2 classrooms, aiming to highlight the impact of collaborative writing activity on learners' outcomes considering previous research into FTF collaborative writing (section 2.5.1). Additionally, factors that may promote or hinder collaborative writing activities in the FTF context are also discussed (section 2.5.2).



With rapid technological development, Web 2.0 tools have become popular for collaborative writing activities in language-learning settings (section 2.6). As a result of recent technological advancements and the creation of web-based writing platforms such as Wikis and GD, previous research in the L2 context has indicated that collaborative writing has increased its potential benefits. The following subsections categorise these benefits into three significant advantages based on previous studies' focus on promoting either learners' interaction in discussion mode (section 2.6.1), revising behaviours in text mode (section 2.6.2) or improving learners' writing outcomes (section 2.6.3). Reviewing the literature on collaborative writing using Web 2.0 tools with inconclusive findings suggests that language learning is affected by the degree of learners' collaboration; issues that affect learners' collaboration in online collaborative writing are highlighted in section 2.6.4. Section 2.7 discusses the role of teacher intervention in promoting student collaboration, discussing teacher intervention as a factor that impacts learners' collaboration in collaborative writing using Web 2.0 tools suggests the need to examine the impact of teacher intervention on improving EFL learners' writing outcomes. After identifying the gap and considering the aim of the current study, it is necessary to highlight the collaborative behaviours educators should adopt to facilitate student collaboration and the non-collaborative behaviours educators should avoid based on empirical research in sections 2.7.1 and 2.7.2. Finally, the research questions proposed for the current study are presented.

## **2.2 Sociocultural theory**

Vygotsky's (1978, 1981) SCT provides a theoretical background to CL (Thousand, Villa & Nevin, 1994; Gillies & Ashman, 2003; Vanderburg, 2006; Rojas-Drummon & Merce, 2003) because it highlights the relationship between social interaction and the development of cognitive competencies in an individual (Donato, 2000; Lantolf, 2000; Swain, Kinnear &

Steinman, 2011; Zuengler & Miller, 2006). Vygotsky's theory proposed that learning is predominantly a social process, and the development of all mental abilities, such as intentional memory, voluntary attention and language learning, takes place in a social interaction when a novice or less capable person (a child or less knowledgeable peer) interacts with more capable experts (parents, a teacher or a more knowledgeable peer) (Storch, 2001, 2005, 2013, 2018).

The role of language in Vygotsky's theory is crucial, since language is the mediator in human social interaction. It has been argued by Lantolf et al. (2015) that human language is one of the most powerful cultural artefacts that has enabled people to connect with the world and with one another. Storch (2001) states that "language is the symbolic tool that not only mediates cognitive development but also reflects and shapes that development" (p. 36). In his sociocultural theory, Vygotsky (1978, 1981) claimed that a child's cultural development occurs on social and psychological planes. Language is the mediator on both planes: on the interpsychological plane, when people interact with each other using a form of social speech, and on the intrapsychological plane, when language is used to mediate an individual's thoughts as a form of private speech, or what Vygotsky called "egocentric speech". Using these two planes, Lantolf (2000) explains how Vygotsky's theory explains individual cognitive abilities. Functions in individual cultural developments occur first on the intermental plane, through social interaction, and then they internalise into individual systems and appear on the intramental plane.

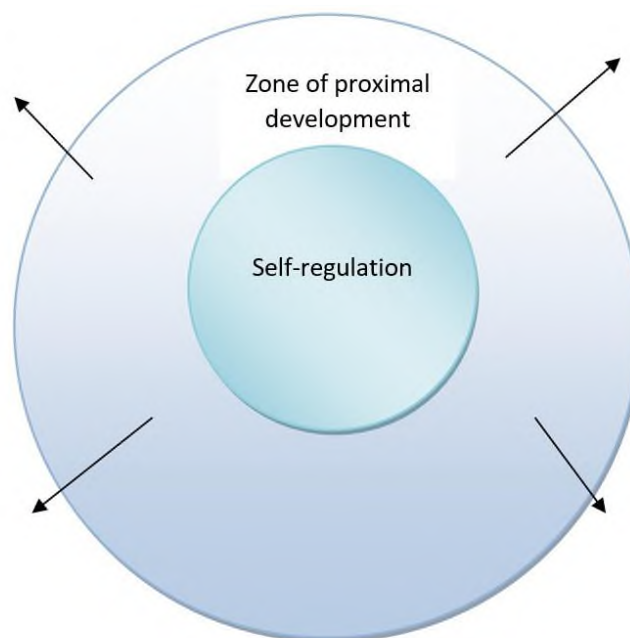
In Vygotsky's theory, "the child develops from being 'object regulated' to being 'other regulated' by a more able peer before becoming 'self-regulated'" (Storch, 2001. p 33). For example, in dialogues between individuals (the interpsychological plane), an expert interprets and clarifies the meaning of any action performed by the novice in a meaningful conversation. The meaning imputed by the expert is then internalised and integrated within

the novice's system and becomes part of that individual's own resources, which can be adapted and used independently (the intrapsychological plane). According to Lantolf, (2005) internalisation, whereby cognitive development processes are constituted, is the transition from depending on social sources of knowledge to depending on internal sources of knowledge. However, many researchers (e.g., Wertsch, 1998; Wertsch & Stone, 1985; Aljaafreh & Lantolf, 1994; Lantolf, 2000; Leont'ev, 1981) have pointed out that when the novice is involved in this transitioning, they should not only imitate or copy what an expert does or says; rather, they should adopt the action into their internal mental function for use in the future.

Vygotsky's idea of the zone of proximal development (ZPD) highlights the significance of social interaction in cognitive development. He defines it as "The distance between the actual development 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). The ZPD thus involves an expert and a novice, and it operates on two levels: the current level, or the actual ability of the learner, and the potential level, or the ability that could be acquired with the assistance of a more capable individual (De Guerrero & Villamil, 2000). The expert's role is to give novices assistance not only by improving their performance but also by encouraging them to take responsibility for completing an activity by themselves. In the literature, this assistance is referred to as 'scaffolding' (Wood et al., 1976). Dennen (2004), as cited by Albeshier (2012), defines scaffolding as "a metaphor for a structure that assists learners in attaining their goals and is gradually removed as it is no longer required, similar to physical scaffolding placed around a building during construction and removed as it nears completion" (p. 22). Vanderburg (2006) asserts that ZPD and scaffolding are the critical components of learning from an SCT perspective. Wells (1999a) listed three aspects that determine the effectiveness of scaffolding

operating in the ZPD: 1) the nature of the interaction and guidance offered by the expert; 2) the kind of task in which learning takes place, and 3) the role of artefacts that mediate learning.

The ZPD is clearly depicted in Lier's (1996) diagram (Figure 2.1). The large circle indicates the portion of the ZPD where learners are unable to complete a challenging task without assistance from a more capable individual. The circular area in the centre, labelled 'self-regulation', represents the point at which the learner can complete the task independently.



**Figure 2.1** Zone of proximal development

It is thus the distinctive notion of assisted performance in Vygotsky's theory of the ZPD that attracts many researchers and educators in language learning: the idea that a learner's ability to perform a difficult task with mediation or assistance today is indicative of their ability to perform the same task alone in the future (Lantolf et al., 2014).

## **Language learning from the SCT perspective**

Unlike cognitive theories which argue that internal cognitive processes and biological mechanisms serve as primary contributors to knowledge (Krashen, 1985; Varonis & Gass, 1985; Long, 1983; Gass & Varonis, 1994; Pica, 1994), SCT hypothesised that learning a language is a fundamentally social activity that is generated by the social interaction between an expert and a novice. According to Storch (2001, 2013), the rationale for using interaction inside the L2 classroom, when the expert (a teacher or more capable peer) interacts with the novice learner, is derived from Vygotsky's theory. Two key concepts in SCT have attracted the attention of L2-learning researchers: the use of language and the nature of scaffolding in the ZPD.

- **The use of language**

Language is an essential concept in SCT as it mediates cognitive learning development. In the field of L2 learning, researchers believe that language plays a unique mediation role. For example, using language in learning in fields such as mathematics mediates the learning of mathematic concepts and skills, while in the field of language, language mediates language learning and its own construction. Swain has paid considerable attention to explaining the role of language in mediating L2 learning. Influenced by SCT, Swain (2000) suggested that during engaging in collaborative language activity, students identify gaps that exist within their own or other's language productions and pool their language knowledge to find a solution. Language, according to Swain (2006), is a social cognitive tool that mediates language development, and learners use language in their deliberations when attempting to solve linguistic problems. As a result, she created the term 'languaging'. Languaging means "using language to direct thinking when attempting to solve a problem" (Storch, 2013; p. 165). As a unit of analysis, Swain and Lapkin's (1995) language-related episodes (LREs) are

commonly used by researchers investigating the nature of learner–learner interactions during collaborative activities. These episodes illustrate learners’ conversations regarding grammatical rules, for example, when they deliberate about language issues, the meaning of particular words or even about the mechanics of writing these words while completing the task (Storch, 2011, 2013, 2018).

It has been argued that languaging includes both private speech and collaborative speech. Both forms of languaging occur when learners try to solve a problem; the difference is that in private speech the talk is directed to the self, while in collaborative dialogue the speech is directed to others. Lantolf (2005) reported that although private speech could help the learner to understand something they did not understand before, the solving of the problem using private speech cannot be guaranteed. However, according to Storch (2013), the role of languaging is not restricted to solving problems; rather, its importance lies in its role in the process of constructing new knowledge.

In a 1999b study Wells suggested that interaction among L2 learners during collaborative activity enabled them to engage simultaneously in both private and collaborative speech. In other words, when working collaboratively learners notice linguistic gaps. They first engage in a self-dialogue to try to find a solution; the private speech then becomes public when the learner asks questions or seeks an explanation in collaborative dialogue. Storch (2013) suggested that in a CL activity, learners’ vocalised hesitation is a form of private speech that can be considered as a signal of requesting assistance, while the response in the form of a suggestion or confirmation is provided by the other learners.

- **The nature of scaffolding in the ZPD.**

Inspired by Vygotsky, L2 researchers argue that learners will be able to accomplish any language activity that is beyond their current cognitive ability with effective scaffolding. In

other words, language engagement is thought to assist students in negotiating their ZPD when working with a more knowledgeable person. Some researchers have analysed teacher–learner interaction to examine the learner’s development after being involved in interaction with the teacher, and whether the assistance provided by the teacher was helpful in developing the learner’s language (e.g., Hawkins, 1988; Aljaafreh & Lantolf, 1994; Nassaji & Cumming, 2000). For instance, Aljaafreh and Lantolf (1994) analysed the amount of guidance given by the teacher, whether it was explicit guidance, such as giving the learner the correct answer; or implicit guidance, such as asking the learner to identify their own errors. The findings of this study indicated that the scaffolded assistance provided by the teacher increased the learner’s awareness of using grammatical rules and reflected the process of transition from other-regulated to self-regulated activity. Although these studies emphasised the important role of the expert’s assistance in language-learning development, others argue that learners can work collaboratively in groups without or with little teacher guidance just as effectively. This gives rise to the need to investigate whether the scaffolded assistance provided by pairs or groups in L2 classroom leads to language learning.

Despite the fact that in SCT, scaffolding in the ZPD should be provided by a capable person, other studies suggest that homogeneous pairing in L2 classrooms can also be effective in language-learning development (e.g., Kowal & Swain, 1994; Donato, 1988, 1994; Ohta, 1995, 2001). For example, Kowal and Swain (1994) reported that pairs of students sharing a similar proficiency level in L2 took turns assuming the role of expert. Both learners were able to scaffold each other by participating equally in the collaborative activity and taking equal responsibility for solving any problem in language accuracy. Ohta (1995) found that in pairs of learners with different levels of L2 proficiency (heterogenous), the role of the expert was similarly fluid. Learners can engage in CL and share their strengths in correcting language errors. Thus, it is even possible for a less knowledgeable learner to provide help to more

knowledgeable learners (Ohta, 1995, 2000; Watanabe & Swain, 2007). This led Ohta (2001) to give a revised definition of the ZPD, defining it as “the distance between the actual developmental level as determined by individual linguistic production, and the level of potential development as determined through language produced collaboratively with a teacher or peer” (p. 9).

Donato’s (1988, 1994) studies produced different findings regarding mutual assistance by learners engaged in a collaborative activity. His studies involved learners of French divided into two different groups: collective and loosely knit groups. He reported that not all the learners succeeded in scaffolding each other in the collaborative activity. Unlike learners in loosely knit groups who work individually, learners in the collective group engaged in what he termed “collective scaffolding”, where the learners were able to pool partial knowledge to find solutions for language difficulties and reach an outcome that they may not have been able to reach individually. A noteworthy finding of Donato’s studies was that collective interaction was conducive to L2 learning. Learners in the collective group were not only successful in providing collective scaffolding; they were also able to retrieve most of the language items in a subsequent individual activity. Storch’s (2002) study which will be discussed in detail in section 2.4.3 provided further convincing evidence of language learning: she found that not only did learners engage in different patterns of interaction, but, more importantly, some interaction patterns led to knowledge retention and the development of language learning. She indicated that learners involved in *collaborative* and *expert/novice* interaction patterns engaged in mutual discussion and transferred the language knowledge acquired from pair work to subsequent individual performance. However, there was no evidence of knowledge internalisation in the other two patterns of dyadic interaction (*cooperative* and *dominant/passive*).



From the above discussion, it appears that L2 researchers informed by SCT agree that language learning occurs when learners work on a collaborative activity and notice their own or other's linguistic gaps. They engage in languaging, whereby they can articulate their own linguistic knowledge and scaffold each other by pooling linguistic resources. They do this by asking for suggestions or clarifications that enable them to construct extensive linguistic knowledge that exceeds their individual capabilities. However, in the study of Donato (1994) and Storch (2002), it is noted that language learning is facilitated by certain types of interaction. Their findings draw attention to the fact that some factors must be present for CL to take place. Researchers suggested that some characteristics of learners' discourse and actions, as well as the characteristics of their relationships, are important for effective collaboration. In the next section, these factors are explained further to present a clear definition of CL from the SCT perspective and to show how collaborative learning differs from cooperative learning.

### **2.3 Collaborative learning**

As hypothesised in SCT, learners' interaction is a site for constructing knowledge. Thus, the application of CL activities in language classrooms is supported by SCT (Swain, 2006; Donato, 2004; Storch, 2011, 2013). In terms of learning L2, the use of language in a classroom collaborative activity provides opportunities for learners to acquire the target language. Collaboration can be defined in general as the process of sharing labour (oral or written) by two or more learners to achieve the target (Storch, 2013; Beatty, 2010). Although some researchers refer to any group or pair work as a CL activity, many language researchers believe that simply placing learners in groups is not sufficient to guarantee collaboration (e.g., Wells & Chang-Wells, 1992; Storch & Aldosari, 2013; Roschelle & Teasley, 1995; Alkhateeb, 2020; Bruffee, 1995; Li, 2013; Dillenbourg, Barker, Blaye & O'Malley, 1996;

Abrams, 2016; Donato, 2004; Kim & McDonough, 2008; Rouhshad & Storch, 2016; Alghasab, 2015; Li & Zhu, 2011; Elabdali & Arnold, 2020; Storch, 2002, 2013; Tan, Wigglesworth & Storch, 2010; Kitjaroonchai & Suppasetsee, 2021). These researchers have all concluded that that specific features of learners' discourse and actions determine the level of their collaborative learning. They proposed that learners' discourses should be viewed as collaborative dialogues in which learners exchange reciprocal feedback, while their actions should reflect mutual agreement on each other's contributions, as well as sharing responsibility for and authority over the tasks. Moreover, researchers highlighted the importance of building strong group relationships to facilitate better collaboration. According to them, these characteristics distinguish *collaborative* learning from *cooperative* learning, in which the process of collaboration is based on task distribution among learners.

- **characteristics of learners' discourse**

According to researchers guided by SCT, collaboration occurs in collaborative activities when learners engage in reciprocal interaction to negotiate the process of decision-making in order to produce the activity and achieve the common goal. This process is not merely a form of exchanging ideas and feedback; it involves the sharing of understanding and a reliance on each other's resources to co-construct new knowledge.

In CL, learners use language as a semiotic tool to deliberate about the given task, to clarify any difficulties and to give feedback on ideas. However, researchers argue that in L2 learning, learners engaged in CL will not be able to reach an agreement on how to construct the task unless they are involved in collaborative dialogue (e.g., Camps et al., 2000; Storch, 2013; Swain, 2000, 2006; Swain & Watanabe 2013). According to these researchers, collaborative dialogue occurs in a collaborative activity when learners notice a gap in their knowledge and ask for feedback or request an explanation, or when learners disagree with

their partners' views, thus obliging them to justify their suggestions. This collaborative dialogue leads to what researchers call collective cognition, where learners rely on each other's knowledge. Swain and Lapkin (1998), Donato (1994), Swain (2000), Kitade (2008) and Storch (2002) convincingly argue that the important outcome of CL is not the co-constructed production; rather, it is this collective cognition, whereby learners obtain insights they could not have obtained when working individually. In other words, if learners adopt a collaborative orientation, they will engage in a collaborative dialogue that involves pooling each other's resources of knowledge in order to solve any problems that arise in the task, and collectively scaffold each other in constructing new knowledge. Thus, their collective abilities enable them to accomplish a task that goes beyond their individual competences and to develop their individual cognitive abilities.

According to Storch (2013), collaborative talk from the SCT perspective does not require a comprehensible message as in Long's input hypothesis; it occurs as a consequence of learners' deliberations over the best way of expressing an idea. She claims that the level of collaboration can be assessed by measuring the degree of learners' engagement with each other's contribution, or what she called 'mutuality', that is considered an essential element of collaborative dialogue. For example, Storch discovered instances of pairs whose discourse was rich in reciprocal feedback, indicating a high level of mutuality. The high level of mutuality helped these pairs to become involved in collective scaffolding, whereby they were able to enhance their linguistic abilities while co-constructing the collaborative task effectively. They were also able to translate their new knowledge into subsequent tasks performed individually. A high level of mutuality in learners' discourse may therefore be considered as evidence of collective scaffolding, which not only helps learners to co-construct the task, but also enables them to internalise the newly constructed knowledge for future individual use.

- **characteristics of learners' actions**

some characteristics of learners' actions are important for effective collaboration. Learning collaboration is determined by the extent to which learners are willing to contribute together, or what Storch refers to as 'equality' (De Guerrero & Villamil, 2000; Johnson & Johnson, 1987, 1989; Beatty & Nunan, 2004; Donato, 2004; Storch, 2002, 2013). Researchers argue that simply forming students into small groups will not lead to collaboration if learners do not share the responsibility to complete the task and if they do not know how to deal with each other correctly (Johnson & Johnson, 2009; Donato, 2004; Storch, 2001, 2002, 2013). According to Storch (2002, 2013), CL is evident when learners contribute equally to the task and share responsibility for and authority over the task. This means that learners' awareness that everyone in the group has to collaborate effectively is an important indicator of CL (Donato, 2004). In other words, the realisation that the failure of any individual in the group will lead to the failure of the whole group helps to ensure that students collaborate effectively (Johnson & Johnson, 1987, 1989). Conversely, a group's reliance on a single person to finalise a task or to take an authoritarian stance by controlling the task and imposing ideas on others are negative actions that hinder collaboration (Dillenbourg, 1999; Storch, 2013; Littleton & Hakkinen, 1999; Kagan, 1994). Therefore, CL is effective when learners are willing to contribute to the task, sharing ownership and responsibility equally for co-constructing the task without any conflict (Nelson & Murphy, 1993; Storch, 2013; Beatty & Nunan, 2004; De Guerrero & Villamil, 2000).

- **characteristics of learners' relationship**

Learners will not be able to engage in collaboration with a high level of mutual interaction and an equal level of contribution unless they first establish a social relationship by working *as* a group rather than merely *in* a group, and by viewing their individual goals as team

objectives instead of competitive ones. According to Storch (2013), the best way of explaining the social relationship of learners is through examining learners' orientation to the activity. Here, the notion of orientation includes learners' attitudes toward working collaboratively, the goals which drive their actions and "whether these goals overlap or compete" (p. 69). In other words, if learners are willing to work collaboratively and jointly construct their goals, they will develop a sense of social relationship which will be reflected in their interaction and action. In her studies, Storch interviewed learners to investigate their attitudes toward working collaboratively (2001, 2004). She found that learners who were oriented to performing writing activities in a collaborative way (*collaborative* and *expert/novice* relationships) regarded collaborative writing as valuable activity and praised each other's contributions. In addition, the discourse analyses of pair talk in these two patterns of interaction showed that the learners had a sense of text ownership which could be observed through the high frequency of first-person plural pronouns (we and our). The use of these pronouns not only signified a high level of collaboration among the learners, but also indicated that the learners had built good social relationships through sharing responsibility for the task (Tan et al., 2010; Li & Zhu, 2011; Storch, 2001, 2002, 2013).

- **Cooperative versus collaborative**

Despite the distinctive features of CL, some authors do not distinguish between the two terms *cooperative* and *collaborative*. These terms are widely used in the field of language teaching; however, many researchers use them alternately (e.g., Dickinson, 1986; Gonzalez-Edfelt, 1990; Kohonen, 1992; Greenfield, 2003). It is therefore important to consider the similarities and differences between these two approaches.

According to Storch (2013), cooperation is a form of group learning activity in which learners contribute equally to complete a task that is structured by the teacher. Cooperative

learning is considered to be a teacher-centred approach, the aim of which is to apply classroom techniques that help learners to complete a particular task and achieve specific goals (Panitz, 1999; Rose, 2002). Thus, the process by which the structure is imposed by the teacher, and the labour is divided equally among the learners – with each learner completing a particular part of the task individually – is referred to as the cooperative approach. The philosophy of CL, on the other hand, is quite different, in that it is considered to be a democratic process that gives students the opportunity to share authority with the teacher (Abrami et al., 1995). For instance, students are given the power to govern and evaluate their group (Pradl, 1991). According to Bruffee (1993), CL is a re-acculturative process that gives students the right to make decisions which in the traditional method were the prerogative of the teacher.

Despite the general consensus among researchers that both approaches entail the notion of learners working together in order to achieve a shared goal, as Underwood and Underwood (1999) and Storch (2013) point out, cooperative learning involves a division of labour in which each learner is responsible for completing one sub-task individually to facilitate the fulfilment of one overall task, while in CL, there is no division of learners' roles or their contributions to the task. Rather, all learners coordinate their efforts through effective interaction and share responsibility for the accomplishment of the task.

Although Paulus (2005) suggests that the division of labour among students in cooperative learning is necessary so that the task can be completed in the right amount of time, this method does not promote effective interaction among participants that results in the co-construction of knowledge. CL, on the other hand, requires more than the simple accomplishment of a task on time; the emphasis is on mutual engagement with others in the entire learning process (Dooly, 2008; Storch, 2002, 2013). Schrage (1990, cited in Paulus, 2005) describes collaboration as a “process of shared creation: two or more individuals with

complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own” (p. 113).

The preceding discussion identified when CL takes place. The next section discussed how collaborative writing tasks promote CL and social interaction.

## **2.4 Collaborative writing**

L2 researchers suggest that the distinct nature of a CL activity is what encourages learners to engage in interaction and to focus on language. They have reported that some tasks are more effective in promoting collaboration than others. For example, Cumming (1989), Williams (1999, 2008, 2012) and Adams (2003, 2006) (cited in Storch, 2013) state that a collaborative writing task where the learners practise both speaking and writing is preferable, since it offers better conditions for learning the language than a purely oral task, and it gives learners the opportunity to enhance their language and writing abilities.

Writing in general is a formal act that represent thoughts, not merely by putting words and ideas on a piece of paper but rather through the enormous amount of effort and concentration that are involved in the process (White, 1987; Smith, 1989, cited in Alshahrani, 2011). However, in the context of L2 learning, writing has been viewed by researchers as a social act that requires an authentic audience to encourage learners to improve their writing abilities (Osuna, 2000; Warschauer, 2000; Al-Jamhour, 2005). Previous research into writing (Bruffee, 1984; Harris, (1994, cited in Storch 2013) claimed that writing in all its forms can be considered a collaborative activity, since individual writers obtain assistance by having a reader in mind. However, L2 researchers have provided convincing evidence of the great advantages of collaborative writing over solitary writing in both learning the language and learning to write in L2 (e.g., Storch, 1999, 2005; Storch & Wigglesworth, 2007; Kim, 2008; Fernandez Dobao, 2012; Shehadeh, 2011).

According to Bruffee (1984), collaborative writing and the process approach to writing, since they are both social activities, affirm that writing is a social activity in which social interaction between reader and writer should take place. In section 2.4.1, the process approach to writing is described in detail, as well as how it promotes group activity (i.e., peer feedback). Additionally, it discusses the factors that influence peer feedback's effectiveness. This is followed by a definition of collaborative writing activities, distinguishing them from other forms of group writing, such as peer planning and peer editing, in section 2.4.2. Section 2.4.3 describes when the collaboration in collaborative writing occurs.

### **2.4.1 Process approach of writing**

Prior to the development of the process approach, it was widely assumed that effective writing was solely dependent on linguistic knowledge (spelling, grammar, punctuation and vocabulary) rather than linguistic skill (planning, revising and drafting) (Badger & White, 2000). This traditional method is known as the product approach, in which writing is evaluated on the production of grammar, lexicon, vocabulary and syntax (Pincas, 1982; Silva, 1990; Porto, 2001). In this approach, students mimic and imitate given texts and patterns, focusing on the outcome rather than the process (Nordin, 2017; Gabrielatos (2002, cited in Al Khateeb, 2014). However, in the 1970s, Western linguistics researchers started to make a transition from the writing product approach to the writing process approach (Williams, 2003). They discovered that writing is an iterative process that should involve activities such as planning, drafting and revising (Emig, 1971; Raimes, 1985; Belinda, 2006; Zamel, 1983; Hyland, 2003; Albeshar, 2012; Rose, 1980; El Mortaji, 2001; El-Aswad, 2002;). In the process approach, writing is a recursive process in which the stages of pre-writing, drafting, revising and editing can be moved forward or backward at any time during the writing activity (Perl, 1978, 1980; Raimes, 1985; Hyland, 2003). Unlike the product-based approach, which concentrates on the generated written text, the process approach focuses more on how



texts are constructed (Grami, 2010). With L2 writers, the activities and stages of the process approach help them to solve their language problems and improve their writing abilities. Brown (2001) reported that the process approach is useful in language learning because its elements and activities increase students' attention to language choice and encourage them to focus on content when they convey their message. In the Saudi context, Al-Qurashi (2009) found that Saudi EFL writers lack many writing process techniques, but after being involved in the stages of the writing process approach, there was a noticeable improvement in their writing.

### **Activities and steps of the writing process approach**

Students involved in writing should practise activities and go through stages such as brainstorming, planning, mind-mapping, collecting ideas, discussing, drafting, revising, editing and publishing (Tribble, 1996, 2003; Kroll, 2003; Williams, 2003). According to Graham (2006), the process of writing includes three stages: 1) planning, which means organising ideas and content; 2) writing, which results in a written draft, and (3) reviewing, which involves correcting errors. For the purposes of the present study, the activities of the process approach to writing are summarised in four important stages: 1) pre-writing, which the student does before the actual writing; 3) drafting, which takes place during the writing process, and post-writing, which includes two stages – 3) revising; and 4) editing. These stages are discussed below.

### **Pre-writing**

Before beginning to write, a student will engage in various activities to plan their writing, such as collecting ideas and brainstorming (Zamel, 1982; Elbow, 1973). The planning stage is critical and should be completed by the writers before they begin writing. Making an outline, organising ideas and gathering information are all parts of this stage. Making an outline

assists writers in organising their ideas by beginning with small ones and progressing to larger ones (Williams, 2003). Manchón et al., (2007) suggested that the planning stage is a chain of guiding principles that help the writer to embark on the writing process. Robinson (2003), Schmidt (2001) and VanPatten (2002) (cited in Alshahrani, 2011) state that the planning stage promotes the use of problem-solving strategies; this aspect makes this stage particularly useful with L2 writers, because they are engaged in a struggle to find the best vocabulary and the most appropriate grammatical and rhetorical patterns to convey their ideas at the same time.

### **Drafting**

After brainstorming, collecting ideas and making an outline, the writer needs to write the first draft. According to El-Aswad (2002), writers draft when they put their ideas into sentences and paragraphs. During this stage, writers must explain and support their ideas in detail in order to establish connections between the ideas they are presenting. Roca de Larios et al. (2008, cited in Alshahrani, 2011) mention that most L2 writers find the drafting stage to be a challenging one, accounting for 60 to 80% of the total time spent writing. Yang (2006, cited in Alshahrani, 2011) attributed this difficulty to ESL writers' lack of vocabulary. He claims that, due to their limited knowledge of words in the target language, ESL students are frequently unable to bridge the gap between what they wish to express and what they can express in writing.

### **Revising**

The focus in the revision stage is on checking and correcting the content rather than the grammar, spelling or punctuation (Hedge, 1988; Tribble, 2003). After writing the first draft, students will need to delete, add and rewrite the material so that their ideas are expressed as accurately as possible. Deleting needless sentences or expanding on important ideas and

moving paragraphs forward or backward are essential activities in the revision stage (Hedge, 2000; Williams, 2003).

## **Editing**

Editing is a stage that focuses on correcting grammar, punctuation and spelling (Harris, 1993). Since writing is commonly regarded as a tool for reflecting on vocabulary and grammar learned, EFL writers strive to produce error-free writing; therefore, King and Chapman, (2003) and Hewings and Curry, (2003) reported that involving learners at this stage using different strategies and techniques, such as working in groups and using technology, is beneficial.

There is widespread agreement that a process-based approach to writing facilitates interaction in L2 (Graham and Sandmel, 2011; Liu and Hansen, 2002; Storch, 2013; Nunan, 1991). Graham and Sandmel (2011) reported that the view of writing as a social collaborative act has led many writing scholars to integrate the process approach with CL or group work.

According to Storch (2013), the philosophical foundation of the process approach is “social constructivism, which draws on the work of scholars such as Vygotsky (1978), Dewey (1938/1970) and Freire (1970)” (p. 23). These theories consider the classroom as a social site for learning, and knowledge should be constructed by learners through social interaction. Therefore, researchers believe that the process approach promotes the use of classroom writing activities such as group brainstorming, peer editing and peer feedback (e.g., Nunan, 1991; Ferris & Hedgcock, 2005; Liu & Hansen, 2002; Hyland & Hyland, 2006). For example, Liu and Hansen (2002) state that there is an inextricable relationship between peer feedback and the process-oriented writing approach. In addition, Nunan (1991) mentioned that applying the process approach in teaching writing skills enhances learners’ motivation with regard to writing, since it advocates the use of various collaborative activities. When

learners work together in groups to articulate their ideas or exchange comments with each other, social interaction takes place, increasing motivation.

It has been argued that integrating peer response activities with some stages of the process approach (e.g., integrating peer feedback with the revision and editing stages) is advantageous to L2 writers (Desmet et al., 2008; Hyland & Hyland, 2006; De Guerrero & Villamil, 2000; Tsui & Ng, 2000). Desmet et al. (2008) state that the revision process is an integral part of the writing process, in which peers provide feedback and edit each other's writing. The peer feedback process contributes to the formative development of a text and allows writers to discover other's interpretations (Hyland & Hyland, 2006). In peer feedback, learners make comments on each other's texts, which obliges them to interact with each other. These comments can be either on form: for example, aspects of language accuracy, or on content, in which the focus is on ideas and organisation. Through peer feedback learners can assist each other and engage in effective collaboration, providing suggestions, alternative explanations or evaluating through giving feedback (e.g., correcting or confirmation) (Liu & Sadler, 2003; Storch, 2013; Woo et al., 2013). This type of peer feedback helps learners to improve their writing more than teacher feedback due to its alignment with their linguistic and cognitive abilities (Daiute & Dalton, 1993).

Furthermore, in peer feedback, students assume the role of critical reader, resulting in a more meaningful audience for the text as well as a greater awareness of what they write. For instance, Tsui and Ng (2000) reported that in their study the learners' awareness of their writing was increased after engaging in a peer feedback activity because they realised that their peers would read their texts. The learners in their study also acknowledged that observing their peers during writing and developing ideas helped them to learn how to improve and revise their texts.

However, there have been some issues with peer feedback. For example, although some learners valued peers' comments, other students reported that they mistrusted peer reviewing and rejected these comments. According to Hyland and Hyland (2006), Yang et al. (2006), and Nelson and Carson (1998, 2006), mistrust of peer feedback from students could be attributable to the influences of sociocultural contexts that limit the efficacy of peer reviews (Sengupta, 1998; Zhang, 1995). For instance, a higher value placed on teacher feedback, particularly by those who are accustomed to teacher-centred learning, leads to a lack of trust in peer feedback (Hyland & Hyland, 2006). According to Hamouda (2011), in Saudi Arabia, where the teacher-centred approach was adopted, learners value teacher comments more than those of their peers. Nelson and Carson (1998) also found that Chinese and Spanish ESL students were more likely to use teacher feedback than peer feedback in their final essays, as they were unsure about their peers' language proficiency.

On the other hand, Storch (2013) reported that the unwillingness to give feedback to peers in peer activities is related to the idea of text ownership. She claims that because the reviewed text in peer activities is not a collaboratively produced text, learners avoid making comments out of fear of losing face if the writer finds them offensive. However, the cultural aspect has a significant impact on the concept of face. Nelson and Carson (1998), Ho and Savignon (2007) and Nelson and Carson (2006) said that Spanish ESL students often identify mistakes in other people's writing that need to be fixed, but Chinese ESL students rarely comment on the writing of others or try to claim authority over it.

#### **2.4.2 Definition of 'collaborative writing activity'**

In collaborative writing, a group works together to create a text or a single document (Bossley, 1989, cited in Lowry et al., 2004). However, completing a document collaboratively should involve the stages of the writing process; namely, planning, brainstorming, collecting

ideas and vocabulary, and revising and editing (Rice & Huguley, 1994). From a language-learning perspective, Storch presents a clear definition of collaborative writing activity. She states that collaborative writing is “an activity that requires the co-authors to be involved in all stages of the writing process, sharing the responsibility for and the ownership of the entire text produced” (2019a, p. 40). In other words, participants collaborate at every stage of the writing process, from brainstorming ideas to debating how to structure the text to editing each other’s work. Participating in other’s writing is not limited to one stage of the writing process but is possible at all stages of the writing process (Dale, 1994; Storch, 2013). So, when students work together on a group project, they create a text that cannot be divided into small parts.

A distinction should also be made between collaborative writing activities and activities associated with a process approach to teaching writing, such as peer feedback and group planning (Storch, 2011). Pedagogical collaborative L2 writing can be divided into two categories: process and product. The collaborative writing process involves brainstorming, creating an outline, generating ideas, revising and editing. Collaboration during some parts of the writing process, such as group planning, in isolation does not qualify as collaborative writing because writing means producing a piece of text. The collaborative writing product is the text that everyone in the group worked on together at every step of the writing process (Storch, 2013; Srahl, 2016).

Therefore, what distinguishes collaborative writing from other peer writing activities is co-ownership of the text. For example, as part of a peer-review activity, students exchange feedback with each other, but they cannot change or edit the text since they have no co-ownership of it (Storch 2005). In addition, a writer is free to ignore feedback given by peers they choose (Nelson & Murphy, 1993). When writing collaboratively, on the other hand, both writers should share ownership of the text and be open to any comments made by their

partners. Furthermore, the feedback provided by peers is given only following completion of the text, while in collaborative writing it is provided during all stages of the text's construction (Storch, 2013).

Based on the preceding discussion, second-language acquisition (SLA) researchers agree that collaborative writing differs from other types of groups writing activities, such as peer planning and peer editing. Storch's (2013, 2017, 2019a) definition clearly demonstrated that collaborative writing is unlike any other group writing activity, because it allows students to collaborate in all stages of the writing process by constructing the text, building ideas, and engaging in editing with each other, as well as sharing responsibility for text ownership. However, co-authoring texts by students is not always associated with these distinct collaborative writing characteristics. As a result, the section that follows discusses when collaboration occurs in collaborative writing.

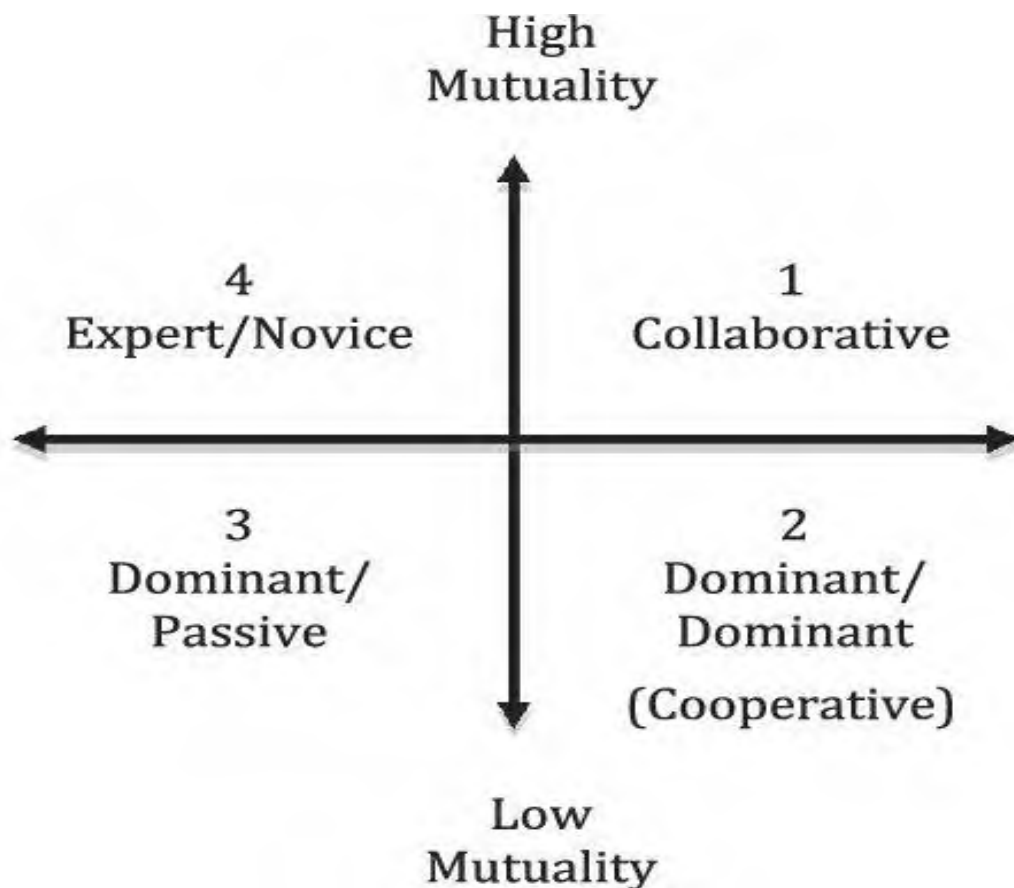
### **2.4.3 Patterns of interaction in collaborative writing**

Wells and Chang-Wells (1992) claim that in collaborative writing, the text mediates students' thinking, opening space for thought and discussion. In other words, co-authoring a text generates external and explicit thinking, such as discussions about content, ideas and language. It is important to note, however, that such discussion is not always feasible when learners collaborate in different ways (Storch, 2013).

The research conducted by Storch (2002) which was briefly mentioned in section 2.2, emphasised that other patterns of interaction may occur in collaborative writing activities. The researcher developed a dyadic interaction model by analysing the audio recordings of ten pairs of ESL students at an Australian university in terms of equality and mutuality (see Figure 2). Equality means the level of learners' contribution to the task while mutuality means the level of learners' engagement with each other contributions.

Storch's dyadic interaction model indicated that in a collaborative writing activity, students engaged in four distinct patterns of interaction, each with a different degree of mutuality and equality. The first pattern of interaction is labelled *collaborative*, which reveals a high level of mutuality and equality. The second interaction pattern is called *dominant/dominant*, or referred to as *cooperative*, indicating high equality and low mutuality. *Dominant/passive* describes the third pattern of interaction, and it represents a low level of mutuality and equality. The fourth pattern is *expert/novice*, which shows a low level of equality but a high level of mutuality.

**Figure 2.2** Storch's dyadic model





Based on this model, many studies have reported instances of students engaging in different patterns of interaction, although they have been asked to write collaboratively (e.g., Storch, 2002; Bradley et al., 2010; Abrams, 2016; Li & Zhu, 2011; Tan et al., 2010; Elabdali & Arnold, 2020; Alkhateeb, 2020). These researches confirmed that some learners in collaborative writing did not contribute equally to the task and did not interact with the same degree of mutuality. Only learners whose relationships could be described as *collaborative* showed high levels of both equality and mutuality. Students in this pattern engaged in collaborative dialogue and collective scaffolding. They contributed jointly to all aspects of the task and engaged with each other's contributions by considering others' suggestions, pooling each other's language resources, deliberating about how to resolve language issues, and sharing responsibility for co-authoring the text.

Based on the previous discussion, a collaborative writing activity in this study is the co-construction of an online essay using GD, in which students contribute equally and interact mutually at all stages of the writing process. Equality in contributions means that learners share responsibility for the generated essay by contributing almost equally to the task. This does not imply that learners will divide the task into subtasks, or sections, with each section being written by an individual student, as in the cooperative approach. Instead, they should share ownership of the essay they produce by adding to each other's writing, editing it and expanding each other's ideas; while mutuality means students' engaging in collaborative dialogues to deliberate over how best to express their ideas. This deliberation should elicit reciprocal feedback between learners, which will in turn facilitate collective scaffolding. In GD discussion mode, learners should provide constructive comments in a friendly manner by asking for assistance from other learners, providing alternative suggestions for improving the

accuracy or meaning of the text and clarifying or justifying what they have written. Mutuality should also be observable in learners' revision behaviour in GD text mode, whether through editing each other's texts from the point of view of grammar and word meaning, expanding on each other's ideas or even incorporating each other's suggestions into the final text. This process should give learners the opportunity to use each other's resources in co-constructing new knowledge and achieving a level of language that would have been unreachable had they worked alone. As a result, this knowledge can be internalised and used in future individual writing.

In the previous sections, collaborative writing based on the underlying assumption of SCT was discussed in detail. The process approach to writing was described as a pedagogical approach that supports collaborative writing; in addition, it is concluded that a collaborative writing activity is considered to be a natural environment for language learning, as it allows learners to engage in collaborative dialogue during all stages of text creation, rather than restricting the learners' interaction to one stage of the writing, as in other group writing activities. Also, characteristics of equality and mutuality that distinguish collaboration in collaborative writing were highlighted. However, the question that remains to be addressed is whether participating in collaborative writing activities results in improvements L2 learners' language-learning gains. In other words, do collaborative writing activities help L2 learners improve their writing abilities to write accurate and well-structured text in L2? Therefore, concerning the aim of the present study, in the next section, the impact of collaborative writing on improving learners' L2 writing outcomes is discussed from the perspective of previous studies on FTF collaborative writing as well as the factors that may shape L2 students' collaborations.

## **2.5 FTF collaborative writing in L2 classes**

Collaborative writing has been adopted in L2 classrooms as a method for learning. According to Storch (2018), Manchón's (2011) notion of 'writing-to-learn' supports using collaborative writing in L2 context. A distinction is made by Manchón between 'learning to write' and 'writing to learn'. The former supports the use of collaborative writing in a first-language (L1) context with the aim of improving writing abilities, while the latter supports the use of collaborative writing in L2 with the aim of encouraging learners to learn L2 through writing. According to Storch (2013, 2018), there are two main components of collaborative writing: interaction and text production. Interaction is the basis of cognitive and SCT of L2 learning. When students interact in a collaborative writing activity, they use L2 to construct and share their knowledge and give each other feedback by asking questions and making suggestions. Production is considered to be an important part of L2 collaborative writing, since it gives students the opportunity to reflect on their language skills. Swain (1998) claims that in a collaborative task L2 learners should produce a jointly written text in order to help them to improve the accuracy of their language and achieve a high level of L2 proficiency. According to Storch (2019a), Swain's (1998) argument encourages researchers to employ collaborative activities in writing classes, because in collaborative writing activities learners pay more attention to their choice of language when they express their ideas. L2 research using think-aloud protocols indicate that writing in L2 requires more time and effort than writing in L1 because the writers need to refer to their knowledge not only for collecting ideas but also for articulating these ideas in L2 (Chenoweth & Hayes, 2001; Manchón et al., 2009; Roca et al., 2006). Writing collaboratively could mitigate these difficulties by giving learners the opportunity to collaborate with each other to find solutions to language-related problems, pooling their linguistic knowledge, rather than each individual depending on their own linguistic resources, thus producing more accurate written texts.

### **2.5.1 The impact of FTF collaborative writing on L2 learners' outcomes**

The number of studies that have been conducted to investigate the outcomes of collaborative writing, in particular those which have aimed to find evidence of learning L2, is very small. Studies in this area have tended to examine the outcomes of collaborative writing by applying two methods. Some of these studies investigated the impact of collaboration on the product by comparing individual and collaborative texts (e.g., Storch, 1999; Malmqvist, 2005; Storch, 2005; Storch & Wigglesworth, 2007; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009; Fernandez Dobao, 2012). The other studies examined whether engagement in collaborative writing led to L2 learning (e.g., Swain & Lapkin, 1998; Storch, 2002; Watanabe & Swain, 2007; Kim, 2008).

With regard to whether collaborative effort could help learners to produce accurate texts, the results of most of the studies that investigated this subject revealed that joint texts were better and more accurate than individual texts. For example, the results of Storch's (1999), Malmqvist's (2005) and Storch's (2005) studies indicate the positive impact of collaboration on accuracy. In her (1999) study, Storch aimed to investigate the impact of discussing grammar collaboratively on producing accurate text. She asked advanced ESL learners at an Australian university to complete three different tasks (closed exercise, text reconstruction and composition) in two versions (individually and collaboratively). Although the students writing collaboratively took a long time to produce their texts, their work was shorter than individual texts. In addition, the results indicated that the products of all the collaborative tasks were more accurate than those of tasks completed individually. In Malmqvist's study, L2 learners of German at a Swedish university were asked to complete two tasks individually and one collaboratively. The tasks were all dictogloss-type tasks. The participants took approximately the same amount of time to complete the individual and collaborative tasks. However, the learners wrote longer texts with more complex sentences when they

collaborated. Therefore, the findings of both the above studies confirm that collaboration helps learners to improve the accuracy of their writing. It should be pointed out, however, that the quality of writing is not limited to the accuracy of the text. Students should focus on all aspects of writing, including the content and structure of the text.

In this regard, Storch (2005) argued that the impact of collaboration can go beyond accuracy to the quality of the text. She compared texts written by students in groups with others written individually in terms of fluency, accuracy, complexity, structure and task fulfilment using quantitative and qualitative measurements. The ESL participants were given the option of completing their work either individually or in pairs. Most of them chose to work collaboratively, with the exception of five students who decided to work individually. Similar to her study in 1999, the researcher found that the pairs took a much longer time and produced a shorter text than the students who wrote individually. However, they produced a more accurate and better-quality text. Since Storch's studies (1999, 2005) had shown that pairs spent longer on writing because of the interaction, Storch and Wigglesworth (2007, 2009) decided to give the collaborative group more time than the individual group; however, significant differences were only found relating to accuracy and not to fluency or complexity. Similar findings were reported by Fernandez Dobao (2012), who examined the accuracy, fluency and complexity of the written texts produced by small groups, pairs and individuals learning Spanish as L2. All groups were given the same amount of time (30 minutes) to produce a text. As in Malmqvist's study, the results indicated that working collaboratively led to students producing a more accurate text even when they were only allowed the same amount of time as the other groupings.

In all the studies mentioned above, collaborative writing was proven to be superior to individual writing in all aspects, especially in terms of accuracy. This may be due to the fact that students can pool knowledge from multiple linguistic resources when they participate in

collaborative writing activities. However, none of these studies have provided evidence that learners are able to retain their newly acquired knowledge and apply it to their own individual writing. Storch (2013) claims that an improvement in accuracy in joint texts does not indicate learning acquisition.

With regard to evidence of language acquisition, there are a few studies on collaborative writing that have attempted to examine the effect of collaborative writing on learning L2 using various approaches. For instance, Kim (2008), Kuiken and Vedder (2002) and Nassaji and Tian (2010) compared the pre- and post-test gains of individual and collaborative groups. The aim of these studies was to measure explicit knowledge of specific linguistic items. Kim (2008) examined the differences in vocabulary performance of learners of Korean as L2. Half of the participants were put in pairs to complete the dictogloss task, while the other half used think-aloud to complete the task individually. Analyses of LREs revealed that both groups produced same number of LREs; however, the majority of resolved LREs were found in pair talk. As a result, the performance of the collaborative group was better than that of the individual group in both immediate and delayed vocabulary post-tests. In contrast, In Kuiken and Vedder's (2002) study, native speakers of Dutch were asked to underline the targeted structure (passive verb) in a set of English sentences in pre- and post-tests. Even though there was a slight improvement in performance from the pre-test to the immediate post-test and the delayed post-test for both groups of ESL learners (individual learners and learners working in small groups), the differences between the two groups were not statistically significant. Similarly, Nassaji and Tian (2010) found no statistical differences between individual and collaborative tests. During the two-week study, two types of tasks (cloze and editing) were completed by ESL participants. After taking part in a pre-test, both groups of students were given a mini lesson each week as a treatment, focusing on a specific linguistic item (phrasal verbs). The post-test was then administered to measure the differences between the two

groups. Despite the finding that all learners in both groups had learned more about the target linguistic items, the results did not indicate that collaboration had a positive effect on learning. In addition, the researchers' analysis of pair interaction showed limited use of phrasal verbs. The authors cited this limitation as the reason for the lack of superior performance in the pair's post-test.

Other researchers have employed a tailor-made post-test, designed after examining students' interactions (LREs) (e.g., Swain & Lapkin, 1998; Swain, 1998). They suggested that the subsequent test should be associated with what learners focus on in their deliberations. According to Storch (2013), "tailor-made tests elicit the learners' explicit knowledge of the specific linguistic item that was deliberated about during the LRE" (p. 82). In their study (1998), Swain and Lapkin used tailor-made tests with high school French immersion learners. After the researchers had qualitatively analysed the nature of LREs in the discussions of pairs as they carried out a jigsaw task, they designed the post-test to examine the learners' ability to retain the linguistic knowledge co-constructed during the LRE. The results of the post-tests showed that learners were able to recall the language knowledge they had discussed. Similar results had been reported by Swain (1998), although learners' retention in his study related to resolved LREs. Around 79% of the resolved LREs were remembered by the learners in the post-test.

Although both studies provide evidence of learning by linking LREs and post-test outcomes, Loewen and Philp (2006, cited in Storch, 2013) mention that tailor-made tests lack a pre-test to assess learners' knowledge prior to treatment. Thus, this kind of test may only indicate a strengthening of existing knowledge rather than the acquisition of new knowledge. Furthermore, Swain and Lapkin (1998) admitted that applying this kind of test is extremely difficult and puts a great deal of pressure on the researcher, particularly since the post-test should be designed during the timespan of the study.

Clearly, from this review of empirical studies on language-learning gains, regardless of the approach they adopted to measure outcomes that attempting to find evidence of learning through the impact of collaborative writing provided mixed results. However, all the previous studies examined the differences in gains after engaging learners in only a few activities or even a single collaborative activity for a short period of time. In Kuiken and Vedder's study, discussed above, the researchers admitted that, because of the short time span of the study, no evidence that the interaction made an impact appeared in the outcomes of the collaborative group. Furthermore, Swain and Lapkin (2001) and Storch (2011, 2013, 2018) confirm that in order to gauge the impact of collaborative writing on language-learning outcomes, longitudinal studies where the learners have the opportunity to take part in several collaborative writing activities are required. However, only one longitudinal study, by Shehadeh (2011), which aimed to examine the impact of collaborative writing on learning a language, has been conducted FTF. Shehadeh's (2011) study assessed the impact of collaborative writing on language learning over a period of 16 weeks, using pre- and post-tests. Lower-intermediate level EFL learners were divided into two classes (experimental and control). Learners in the experimental class worked in pairs and produced 12 essays (one every week), while the learners in the control class generated the same number of essays but worked individually. What distinguishes this study is not only the fact that the learners in the experimental class engaged in a series of collaborative writing activities before taking part in the post-test, but also the fact that the tasks used in both pre- and post-tests assessed learners' implicit knowledge in all aspects of writing (content, organisation, vocabulary and grammar), unlike other studies that used separate grammatical item activities. Although the results of the study indicated that learners who wrote in pairs during the term were more able to develop content, organisation and vocabulary in their subsequent individual performances than those who worked individually, the collaboration did not affect grammatical accuracy. Therefore,



the result of Shehadeh's study provided convincing evidence that despite the notable features of providing learners with the opportunity to engage in several collaborative writing activities, this does not lead to improved outcomes in all aspects of writing. Storch (2013) mentioned that one of the obvious limitations of Shehadeh's (2011) study was that the researcher did not examine the learners' collaboration process. She affirmed that in order to investigate the impact of collaborative writing on learning outcomes, a longitudinal study that examines linguistic accuracy, as well as the quality of writing, is required. Such a study should also not neglect to investigate the learners' collaboration process, because focusing "only on the outcomes or only on the process provides only half the picture" (p. 169).

Storch's perspective on the importance of analysing learners' interactions in examining the impact of collaborative writing on learning outcomes was informed by the findings of her study (2002) which, as mentioned in sections 2.2 and 2.4.3, found that in a collaborative writing activity, learners may follow different patterns of interaction and that not all of these patterns lead to language-learning gains. Storch (2013) confirmed that applying the process-product approach is a better way to gauge the impact of collaborative writing on L2 learning. This approach is related to one of Vygotsky's genetic concepts (micro-genesis), the aim of which is to record the development of mental processes over a short period of time. Studies that have employed this approach have tended to analyse how knowledge is co-constructed during the collaborative activity, and then to examine the learners' implicit language knowledge in subsequent individual performances. It should be noted that measuring implicit language knowledge relies on the learners' abilities to use the discussed language item, unlike assessing explicit language knowledge by asking learners to recall targeted language items, as in the two approaches mentioned previously (pre-/post-tests, tailor-made tests).

In Storch's study (2002) conducted over a period of 12 weeks, Storch used the process-product approach to investigate whether the pattern of interaction affects learners' language

individual gain. Each pair of ESL learners at an Australian university first completed one version of three collaborative writing tasks (text reconstruction, editing and composition), then they subsequently completed another version of the three tasks individually. Based on her analysis, the learners displayed four distinct patterns of interaction. The first pattern was *collaborative*, where learners interacted with high mutuality and equality. The second pattern was *dominant/dominant*, where learners displayed high equality but low mutuality. The third pattern was *dominant/passive*, in which learners showed low mutuality and equality. The fourth pattern was *expert/novice*, where learners displayed low equality but high mutuality. The findings indicated that the pattern of interaction does affect language-learning outcomes in subsequent individual performance and that the *collaborative* and *expert/novice* pairs contributed jointly to all aspects of the task, engaged in collective scaffolding and presented evidence of L2 learning in their subsequent individual tasks. In contrast, there was no evidence of language learning in the other patterns (*dominant/dominant* and *dominant/passive*).

The review of the literature regarding the effect of FTF collaborative writing on improving learners' outcomes indicates that collaborative writing activities help learners to generate high-quality joint texts, since collaboration enables them to combine their efforts and resolve language issues. However, the findings with regard to evidence of language learning in subsequent individual performance are inconclusive. The studies' contradictory findings could be attributed to the previously mentioned point (sections 2.2 and 2.4.3) that simply putting students in groups to complete a collaborative activity does not ensure that they will collaborate, and that learners may follow different patterns of interaction. According to Storch (2013), studies on language-learning gains adopting a process–product approach (e.g., Storch, 2002) have provided empirical evidence that there is a strong relationship between the way learners interact and their language-learning gains in subsequent individual performance,

which explains why studies on collaborative writing outcomes have produced mixed findings. It means that the improvement in L2 learners' writing abilities is determined by the degree of their collaboration while composing the collaborative text. Therefore, with a view to promoting learners' collaboration, Research on FTF collaborative writing has identified several factors that may affect learners' collaboration. These factors are discussed in the following section.

## **2.5.2 Factors promote/hinder learners' collaborative writing**

### **Factors which promote learners' collaborative writing**

According to Storch (2013), the main factors that affect learners' interactions are the nature of the writing task (e.g., Storch, 1998; Swain & Lapkin, 2001; Storch & Aldosari, 2010; Kim & McDonough, 2008; Storch & Wigglesworth, 2007; de la Colina & Garcia Mayo, 2007; Wigglesworth & Storch, 2009). The size and formation of the group (e.g., Ohta, 1995; Fernandez Dobao, 2012; Lesser, 2004; Watanabe & Swain, 2007; Storch & Aldosari, 2010, 2013) and the mode of interaction (e.g., Rouhshad & Storch, 2016; Tan et al., 2010). However, in consideration of the aim of the current study, only those studies that have examined the impact of the mode of interaction are discussed in this section (for further information about the other factors, see Storch, 2013).

Some recent research on collaborative writing suggest that the medium of interaction plays an essential role in shaping the nature of learners' interactions in collaborative writing (e.g., Tan et al., 2010; Rouhshad & Storch, 2016). Using Storch's model, Tan et al. (2010) investigated how the mode of interaction impacts students' interaction patterns. During this study, two similar versions of a number of collaborative writing activities were completed by six pairs of beginner Chinese learners in two distinct modes of interaction. Learners wrote the first version of these activities collaboratively in FTF mode, while the second version was

completed in online mode using instant messaging. The study's findings indicated that the mode of communication influenced learners' interaction patterns. Learners working in online mode were more likely to collaborate and cooperate, whereas in FTF mode they tended to form *dominant/passive* and *expert/novice* relationships. The analyses of learners' interactions revealed that learners who collaborated in both modes of interaction were able to engage with each other's suggestions and ideas by giving feedback to each other. In addition, the analyses of the data provide evidence that the online mode encourages equal participation in the task, since more instances of *cooperative* patterns were found in this mode. On the other hand, instances of unequal contribution to the activity were observed in FTF mode, in that most of the students dominated the interaction while others remained passive. However, the authors mentioned that, although the medium of communication in online mode provides more opportunity for learners to participate in the task, this mode may not promote mutual interaction among learners. Rouhshad and Storch (2016) attributed the finding of Tan et al. (2010) to the type of technology used in their study, which is considered to be a communication tool but not a text-creation tool. Therefore, they attempted to examine the impact of mode by using an advanced collaborative writing tool (GD), which not only encourages communication but also assists in the creation of the collaborative text (see section 2.6). In their study, Rouhshad and Storch analysed the talk of the same ESL pairs in FTF mode and in online mode using GD. The comparative analyses revealed that the mediated mode affected learners' interactions. Both modes of interaction exhibit a variety of patterns (i.e., *collaborative*, *cooperative* and *dominant/passive*), but the results about the patterns of the online mode were the same as Tan et al. (2010) had found, in which a *cooperative* pattern was the predominant pattern. The students formed a cooperative relationship by dividing the labour into roles, with one learner acting as scribe and the other

as editor. Despite the author's incorporation of the editor's suggestions, no evidence of engagement was found.

Tan et al. (2010) and Rouhshad and Storch (2016) concluded that online collaboration promotes equal participation among students. However, Rouhshad and Storch reported that the collaborative online platform used in their study (GD) was highly effective in assisting the collaborative writing activity since it provided discussion space. As a result, they proposed that the collaborative writing activity mediated by such a tool should be "carefully designed and monitored" in order to increase both the opportunities for participation among learners and the degree of mutual interaction (p. 285).

### **Factors which hinder learners' collaborative writing**

Studies of students' perceptions highlighted other factors that may impede learners' collaboration during collaborative writing (Abahussain, 2020; Al Ajmi & Ali, 2014; McDonough, 2004; Zhai, 2021; Storch, 2005; Dabao & Blum, 2013). Storch (2013) argues that learners' perceptions and experiences of particular activities in language learning are rooted in their underlying beliefs about language learning. Researchers finding in studies of students' perceptions supported Storch's argument and highlighted some issues that shaped learners' language beliefs, including language-learning history, educational systems and the cultural beliefs of teachers and students. It appears from the findings that a lack of language skills (Al Ajmi & Ali, 2014; Storch, 2005; Abahussain, 2020; Zhai, 2021), perceiving writing as an individual activity (Shehadeh, 2011; Dabao & Blum, 2013; Abahussain, 2020; Storch, 2005), and cultural beliefs regarding the role of the teacher and the student (Dabao & Blum, 2013; McDonough, 2004; Abahussain, 2020) all impact student collaboration.

One of the important issues related to the prior language-learning experience is perceiving writing as an individual activity. For example, Storch (2005) found that an Australian

university's adult ESL students were unwilling to participate collaboratively in writing tasks because they perceived writing as solitary. According to Abahussain (2020), based on a study conducted at Al Qassim University in Saudi Arabia, most Saudi learners demonstrated a positive attitude toward collaboration as an effective method of L2 learning following participation in new collaborative writing experiences; however, some students preferred to write independently because their beliefs about L2 learning were influenced by the teaching methods used in Saudi Arabia (i.e., a teacher-centred approach), classroom activities and individual assessments.

Furthermore, Storch (2005), Abahussain (2020) and Zhai (2021) observed that learners' collaboration was negatively impacted by low-level language proficiency. For example, in a study done by Zhai (2021) with Chinese foreign-language learners, it was found that the learners' lack of confidence in their ability to write in Chinese affected their level of collaboration and how they felt about working together. Based on interviews with 55 intermediate-level Spanish learners, Dabao and Blum (2013) also noted that most learners preferred writing individually rather than collaboratively as it was difficult and time consuming. Time constraints were also cited as a barrier to collaboration in Zhai's study (2021), where many students reported that writing collaboratively was time consuming, which was a primary demotivator.

Another language-related issue that hampered learners' collaboration was mentioned in a study conducted by Al Ajmi and Ali (2014) in an Omani public college with 64 foreign-language learners and five English teachers, which revealed that learners prefer writing independently through a division of labour, because they believed that working in a group does not facilitate grammar-rule acquisition. McDonough (2004) also reported that despite significant gains in performance after a group activity, most Thai EFL students held the view that group work did not contribute to grammatical knowledge.

The sociocultural beliefs of participants are another important issue. For example, maintaining the relationship was an issue that may limit collaboration. Both McDonough (2004) and Dabao and Blum (2013) have observed that despite being aware of grammatical errors, students avoided editing each other's mistakes in order to maintain good interpersonal relations. Abahussain (2020) also reported that some Saudi learners were unable to work in their ZPD because they were worried about offending others. Another cultural issue is valuing teacher feedback over peer feedback. For instance, McDonough (2004) noticed that students relied more on their teachers because they viewed their classmates as untrustworthy resources of linguistic knowledge.

This section discussed in detail the impact of collaborative writing on improving L2 learners' writing abilities and outcomes in the FTF context. The mixed results yielded by the reviewed studies draws attention to the relationship between the level of learners' collaboration and their language gains. Therefore, factors that may promote and hinder learners' interaction while composing the collaborative text were highlighted. Given the aims of the current study, attention was also drawn to the use of technology to assist in the implementation of a collaborative activity with a view to maximising the opportunities for promoting learners' contributions. Tan et al.'s (2010) and Rouhshad and Storch's (2016) studies suggest that implementing a collaborative writing task using a computer-mediated mode results in equal participation among learners. Furthermore, Rouhshad and Storch (2016) reported that the affordances of new collaborative tools (i.e., GD) may not only increase equality in learners' contributions but also the mutuality of the interaction if the collaborative activity carried out using these platforms was well organised and monitored.

In the next section, research findings on the effectiveness of Web 2.0 in supporting students' collaborative processes and improving their final product in collaborative writing activities are introduced.

## **2.6 Web 2.0-mediated online collaborative writing in the L2 context**

With the rapid development of technology and the arrival of web-based writing platforms such as Wikis and GD, the definition of online collaborative writing has expanded. In the last decade, the writing engaged in through Web 1.0 applications such as message boards and chatrooms was only for communicating and exchanging ideas; the writing done through the more recent Web 2.0 tools is considerably more sophisticated. According to Storch (2013, 2018) among all Web 2.0 tools, Wikis and GD are the more relative platforms for collaborative writing. Unlike blogs, where a single author creates the text and the reader can only read and comment without making changes to the originally posted material, these tools allow a group of people to create an online text collaboratively. Based on SCT principles, Wikis and GD are used as tools to facilitate student collaboration in online collaborative writing (Javela, Bonk & Sirpalehti, 1999). Consequently, this section focuses primarily on these instruments. Although GD was used as a mediated collaborative tool in the present study, the use of this tool in academic research has been relatively underexplored (Chu et al., 2009; Rouhshad & Storch, 2016). As a result, it was necessary to cover the literature on both Wikis and GD, since they share similar traits.

The functions of Wikis and GD involve writers in all aspects of the writing process, including exchanging ideas; constructing a text; and revising, editing and producing the text (Li, 2018). Both collaborative platforms (GD and Wikis) include two modes of interaction: discussion and text modes. Each mode has its own purpose, as well as a record of history page; first, the discussion mode allows learners to interact collaboratively and provides them with opportunities for collective scaffolding and for relying on each other's resources of knowledge. In this mode, a page containing the comment history displays all comments in chronological order. Text mode not only permits a reader to write on a specific page but also permits editing and revisions to one's own writing or that of others. Furthermore, this editing



is preserved in the revision histories, and writers can save their documents and engage in editing and revision at any time and from any computer, which means that collaboration and peer editing are not limited by time or space (Yan, 2010; Firth & Mesureur, 2010).

The only feature that makes GD different from a Wiki is the synchronous editing function, which allows contributors to edit the document simultaneously, allowing them to observe each other's editing in real time (Sharp, 2009). According to Yang (2010), collaborators in GD can become involved in synchronous communication by sharing their writing and editing in real time, while in a Wiki, the process of communication is asynchronous (delayed-time). According to Lee and Wang (2013), Taiwanese university students' collaboration is hindered by Wikis' asynchronous communication. The analyses of learners' interview data revealed that students suffer from waiting for other's feedback. In addition, some learners admitted that explaining their viewpoints was difficult in delayed-time communication.

However, Warschauer and Grimes (2007) and Godwin-Jones, (2018) reported that interest in collaborative writing has increased significantly as people have come to realise that writing is a social act, and because of the affordances provided by Web 2.0 tools which allow students to work in pairs or small groups and increase their opportunity for language learning. In L2 classes, there is a growing interest in implementing online collaborative writing using Web 2.0 tools due to its benefits for language learners. For example, many studies have explored the effectiveness of involving learners in online collaborative writing in promoting various skills: for instance, in developing learner autonomy (Kessler, 2009; Lee, 2010; Aydin & Yildiz, 2014; Kessler et al., 2012), in promoting learners' revision behaviour (e.g., Abrams, 2016; Kessler & Bikowski, 2010; Li & Zhu, 2011; Elola & Oskoz, 2010; Kessler, et al., 2012; Kessler, 2009; Arnold et al., 2009; Kost, 2011; Arnold et al., 2012; Mak & Coniam, 2008; Lawrence & Lee, 2017; Elabdali & Arnold, 2020), in facilitating learners' interaction (e.g., Arnold et al., 2012; Alghasab, 2015; Alkhateeb, 2020; Bradley et al., 2010; Alharbi,

2019; Kitjaroonchai & Suppasetseree, 2021), and in improving the quality of the collaborative texts (Kuteeva, 2011; Li & Zhu, 2017; Elola & Oskoz, 2010; Strobl, 2014; Bikowski & Vithanage, 2016; Abrams, 2016; Elabdali & Arnold, 2020).

A review of online collaborative writing studies revealed that previous studies examined the impact of collaborative writing-mediated web 2.0 tools on learners' collaboration by focusing on three different aspects: 1) learners' interaction in an online discussion mode; 2) learners' revision behaviour in text mode; or 3) learners' writing outcomes. The purpose of this section is to synthesise the findings of previous research into online collaborative writing using Web 2.0 tools considering their focus.

### **2.6.1 Learners' interaction in discussion mode**

Studies in online collaborative writing have sought to find evidence of collaboration by examining learners' online discussions, or, in more detail, to determine whether writing collaboratively via Web 2.0 tools promotes learners to deliberate about and reflect upon language use, pool their resources of knowledge to solve linguistic or content problems, and provide corrective feedback to assist each other in co-constructing the text (e.g., Elabdali & Arnold, 2020; Arnold et al., 2009; Elola & Oskoz, 2010; Alharbi 2019; Bradley et al., 2011; Alghasab, 2015; Lee, 2010; Alkhateeb, 2020; Kost, 2011; Li & Zhu, 2011; Li, 2013;; Kitjaroonchai & Suppasetseree, 2021). These studies used the comments the learners posted on online discussion pages as the main source of data, which they then examined to see if there was any evidence of collaboration in the learners' interactions while co-constructing the joint text. Some studies were conducted with university ESL learners (Li, 2013; Li & Zhu, 2011) at Chinese universities or at Saudi universities (Alharbi, 2019) or at an international university in central Thailand (Kitjaroonchai & Suppasetseree, 2021). Others were conducted with learners of English for specific purposes (ESP) (Bradley et al., 2010) at a Swedish

university. Some studies have analysed learners' online discussions in languages other than English and have been conducted with learners of German (Arnold et al., 2009; Strobl, 2014; Kost, 2011), Spanish (Lee, 2010; Elola & Oskoz, 2010) and Arabic (Alkhateeb, 2020). The only study that has been conducted with school students was Alghasab's (2015) study of high school students in Kuwait. The findings of these studies suggested that numerous studies demonstrated that collaborative writing using Web 2.0 tools enables students to interact with one another at all stages of the writing process via discussion mode. However, others suggested that even with Web 2.0 tools that facilitate collaborative activities, some learners may not collaborate.

With regard to learners' planning discussions, Elola and Oskoz (2010) and Kost (2011) noticed that students planned their task collaboratively with an emphasis on enhancing the content of their essay through brainstorming, sharing of resources (such as grammar websites) and discussion of how ideas should be organised in writing. Similarly, Alghasab (2015) observed instances of planning discussions in learners' Wikis in which they proposed ideas and discussed each other's suggestions. Arnold et al. (2009) found that the majority of learners' comments related to planning, but they focused primarily on coordinating and assigning tasks to group members. Bradley et al. (2011) found evidence that students took part in group planning, where they built on each other's ideas by interacting mutually.

Furthermore, some studies showed that collaborating using advanced tools during the drafting stage enhances learners' ability to engage in language talk and deliberate over how best to articulate their ideas. For instance, Lee (2010) reported instances of language-related talk; she found that learners with different levels of proficiency used discussion mode in the Wiki to discuss language-related issues with each other, to provide feedback on linguistic aspects, and to request edits for grammatical issues they were uncertain about. Lee suggested that this type of interaction between students with high and low levels of proficiency enabled the learners

to engage in collective scaffolding that helped them to bridge the linguistic gaps they faced while they co-constructed the text. In the same vein, Kost (2011) found that learners engaged in collaborative dialogue by asking for feedback associated with linguistic aspects, such as grammar and seeking help with editing. She stated that these language-related comments were incorporated into the learners' final product and played an important role in improving writing quality. However, to demonstrate the alleged improvement in writing quality, the researcher did not present the data in terms of frequency or distribution, nor did she examine the learners' final written texts. On the other hand, Stroble (2014) attempted to provide data regarding learners' discourse. To provide evidence of language-related discussion via GD, a small extract of learners' speech has been analysed. Based on these findings, the researcher attributed the improvement in learners' textual accuracy to their mutual interaction about language use. Despite this, the data were insufficient as the extract chosen did not represent the entire dataset.

Alharbi (2019) and Alkhateeb (2020) by contrast, examined all learners' comments based on their frequency. Both studies revealed that the GD discussion mode helped learners place more emphasis on grammar lexis than on meaning. Alharbi (2019) investigated the use of GD as a tool to promote learning practices in an EFL writing course at a Saudi university. Quantification of learners' contributions to the discussion mode showed that learners provided more language-related feedback (63%) than content-related feedback (38%). The researcher reported that EFL Saudi learners typically demonstrate limited proficiency in identifying and providing feedback on global issues within their written texts, primarily focusing on commenting on local issues instead, as they are accustomed to a grammar-based approach to learning the language. In Alkhateeb's (2020) study, six of the nine groups concentrated their discussions on grammatical and lexical issues related to subject-verb agreement, article and word arrangement, word order, plural forms, verb conjugation,

spelling, and phrase structure. The researcher agreed that the GD feature is what draws students' attention to the form.

Similarly, Elola and Oskoz (2010) obtained sufficient data from learners' online discussions to analyse them not only in terms of frequency but also in terms of distribution. In this study, SL Spanish learners were required to write two argumentative essays using Wiki: the first was completed individually, while the second was completed collaboratively. During collaborative writing, learners deliberate more about content than language. The researchers found that the students improved their final writing product by deliberating about essay components, with most of these deliberations dealing with content (51.94%). The learners in this study also engaged in various types of collaborative behaviour, such as showing dis/agreement and providing feedback. Showing agreement or disagreement with their partners' opinions formed the greatest proportion of the total of the learners' collaborative behaviour (44.1%). Advanced Spanish learners found that Wiki discussions assisted them in organizing their assignments and enhancing the content of their essays. However, the researchers suggested that learners' emphasis on content rather than form was due to their high level of language proficiency.

Although the preceding studies suggested that the functions of online tools and the level of language proficiency drew learners' attention to content or form, Alghasab (2015) suggested that teacher intervention contributed to learners' language focus. She did a deep qualitative analysis of three groups' discussions and their teachers at two high schools in Kuwait. The result indicated that one group among these groups exhibited high instances of meaning-related deliberation in which students raised questions, agreed with other's ideas, and provided each other with explanations and clarifications. In addition, students were involved in collaborative scaffolding where they discussed each other's grammatical accuracy. According to Alghasab, the teacher who intervened with this particular group played a crucial

role in encouraging and motivating the learners to negotiate their language and content issues. The teacher did this by stimulating answers from the students, providing hints for correcting language-related errors, and urging them to deliberate on how to organize their ideas effectively. While Alghasab (2015) examine learners discussion through qualitative analysis only, Elabdali and Arnold (2020) examine learners' discussions quantitatively and qualitatively. The researchers found that EFL learners from different language backgrounds at a US university demonstrated a high degree of mutuality when deliberating over meaning rather than language use. Researchers have identified mutuality in meaning discussion as an influential factor driving text quality, as learners were able to improve the quality of the joint text but not accuracy. The researchers suggested that meaningful activity (a short story) encouraged a focus on meaning over form. Therefore, the researchers suggested that meaningful writing assignments be coupled with a process-based writing approach that has distinct stages for formal, stylistic, and content editing.

Studies that analysed students' discussions to examine patterns of interaction revealed that not all students collaborate when writing together using Web 2.0 tools; instead, they engage in different patterns of interaction. For example, Alghasab (2015) found that despite having an advanced tool for group work (Wiki), not all students engaged with each other collaboratively during their discussion. She observed instances of students cooperating by equally contributing to a task, but not collaborating through mutual interaction. Two groups out of three groups did not use the discussion mode effectively. The researcher reported that the two teachers who intervened with these groups contributed to this result. In one group, the teacher took an authoritative approach by assigning tasks to each student individually. As a result, her students showed non-collaborative behaviors such as ignoring each other's suggestions and relying on the teacher. In the other group, the teacher's behavior, in which she stepped back and only asked the students to participate, resulted in an absence of

discussion. Although the researcher claimed that learners in these groups contributed equally but not mutually, she did not provide evidence of their equality by quantifying their contributions to the Wiki.

Other patterns of interactions have also been observed in a study by Li and Zhu (2011), Alkhateeb (2020), Elabdali and Arnold (2020), and Kitjaroonchai and Suppasetseree (2021) which examined learners' patterns of interactions based on Storch's (2002) mutuality and equality criteria. In all these studies learners' contributions to the discussion were quantified and qualitatively analysed. In Li and Zhu's (2011) study, nine EFL students in China were divided into three groups, each with three members. They are assigned to work on three different types of tasks, one task per week. The researchers analysed these tasks and found that learners exhibited three distinct interaction patterns, including *collaborative/mutually supportive*, *authoritative/responsive*, and *dominant/withdrawn*. Learners who engaged in a *collaborative/mutually supportive* pattern of interaction engaged in mutual discourse through deliberating about language use and engaging with one another's text contributions. They also collaborated to scaffold each other by pooling their knowledge resources. In the *authoritative/responsive* interaction pattern, one student assumed authority and made the most contributions to the task. While monitoring the group, this learner encouraged the two other learners to work together, and both accepted his leadership position. This pattern indicated that linguistic resources were pooled to solve language problems, whereas students who exhibited a *dominant/withdrawn* pattern neither engaged in mutual interaction nor contributed equally. In this pattern, two students contribute to the assignment, but they frequently disagree and disregard one another's contributions. The third student was uninvolved and contributed nothing to the discussion. This pattern lacked evidence of collective scaffolding because students did not interact with each other. Although no data were collected to determine the factors that may affect learners' patterns in this study, the

researchers reported that the study's findings are influenced by the learners' unfamiliarity with using Wiki, their different levels of language proficiency, and the degree of familiarity among group members. As a result, the researchers emphasised the importance of providing students with technical training before implementing online collaborative writing activities. Furthermore, they urged teachers to consider the relationships between students and their level of language proficiency when forming small groups.

Similarly, Alkhateeb (2020) investigated the interaction patterns of FL learners of Arabic while discussing their joint essays via GD. using quantitative and qualitative methods, the researcher found that learners exhibited distinct patterns when engaging in discussions compared to when they were involved in the editing process. In discussion mode, learners followed four distinct dynamics: *collaborative*, *collaborative/passive*, *cooperative*, and *dominant/passive*. In the *collaborative* pattern, every member of the group contributed to the discourse by discussing and evaluating the ideas of others. Two students in the *collaborative/passive* pattern actively participated in the conversation throughout the writing process. However, one student played a more passive role and did not contribute to the discussion. Learners formed a *cooperative* pattern, working in parallel with each student completing an assigned part, and did not contribute to one another's ideas. In the *dominant/passive* pattern, one student controlled the conversation while the other two were inactive. While the above-mentioned Li and Zhu's (2011) study suggested that technical difficulty contributed to variations in learners' patterns of interaction without providing supporting data, Alkhateeb (2020) offered evidence from learners' questionnaire responses indicating that the challenges associated with using the discussion mode of GD and typing in Arabic within this tool do indeed affect learners' patterns of interaction. Additionally, students reported that poor task management impeded their participation in the task. As a result, the researcher advocates for teacher intervention in online collaborative writing to



monitor task progress and guide students in using the collaborative platform. In Elabdali and Arnold's (2020) study, discussed previously, the researchers analysed the group dynamics of four groups. As in Alkhateeb's (2020) study, the researchers found that the degree of mutuality and equity affected by mode of interaction of interaction. The result showed that discussion via Wiki led learners to form two interaction patterns. Two of the four groups displayed a *collaborative* discussion pattern in which participants not only contributed equally to the discussion mode, but also engaged with each other's suggestions. The other two demonstrated a *cooperative* pattern. Even though each peer contributed equally to the discussion, they ignored each other's other suggestions. Although this study yielded valuable findings, the researchers did not investigate learners' perceptions to understand the underlying factors behind these observed patterns.

Unlike the studies discussed so far, collaborative patterns were not observed in learners' dynamics via GD in the study of Kitjaroonchai and Suppasetsee (2021). The study aimed to investigate the interaction patterns of two groups of six university students from Asian countries as they completed a descriptive essay and an argumentative essay. The analysis of students' interaction based on Storch's criteria revealed two distinct and consistent patterns of interaction: the *expert/novice* pattern, where one student plays the role of an expert while the other two assumed the role of novices; and the *authoritative/withdrawn* pattern, in which one student controls the task and makes the most contributions, and with the second joining in later and contributing little, while the third member plays a passive role and does not participate in the task. The researcher went beyond examining learners' interaction patterns by conducting a post-interview to gain additional insights. The interview results revealed that factors such as learners' English proficiency, individual roles within the group, and individual goals significantly influenced the patterns of interaction among learners.

Some researchers studying collaborative writing examined their students' discussions to find social talk (Li, 2013; Lee, 2010), also referred to as socio-effective interactions by Alghasab (2015) or phatic communication, according to Elabdali and Arnold (2020), to determine whether Web 2.0 aids in the creation of friendly environments among learners. Based on these findings, learners can establish a positive social relationship when they engage in mutual discussion while completing the task. In Alghasab's (2015) study, for instance, there were many expressions of greeting, encouragement and warmth among the collaborative group members. Furthermore, Elabdali and Arnold (2020) found that phatic posts constituted approximately a third of the posts made by learners who engaged in a high level of mutual interaction, which indirectly promoted their collaboration. Studies by Li (2013) and Alghasab (2015) presented data that showed how learners established strong and cohesive social relationships by complimenting one another's language abilities, such as "How I envy your appliance to words! You are so rich in complex and long English words." (Li, 2013, p. 759) or by expressing emotion, such as "Hello, my lovely group" (Alghasab, 2015, p. 204). In both studies, participants used first-person plural pronouns (we, our) which reflected their close relationships and sense of ownership over the joint text. As discussed in section 2.3, language-learning scholars (e.g., Donato, 2004; Storch, 2002) emphasise the fact that this type of interaction helps learners to establish social relationships, which is important in CL.

### **2.6.2 Learners' revision behaviour in text mode**

Studies that have analysed learners' revisions in the L2 context suggest that this recursive editing process during collaborative writing helps learners to consolidate their use of the new language (Storch, 2011). However, collaborative writing researchers reported that the revision process using newer technologies is more convenient: it allows for a faster response time and therefore increases motivation and creativity (Lam & Pennington, 1995). According to Storch (2019a), learners' contributions to the online joint text, by adding or deleting

content or correcting linguistic errors, are equivalent to interactions and should be evaluated. Therefore, the vast majority of researchers into online collaborative writing in the L2 context have focused primarily on learners' contributions to the online collaborative text because of the general agreement that paying attention to language use during the revision and editing process is beneficial to L2 learning (Kessler, 2009; Storch, 2013), or because collaboration during co-constructing a text should not simply entail adding text segments without considering what others have already written, but rather entails enhancing and expanding on what has already been written by collaborating with other's ideas and words. Some examined the revision process of collaborative writing using Wikis (e.g., Kost, 2011; Arnold et al., 2009, 2012; Kessler, 2009; Woo et al., 2011; Aydin & Yildiz, 2014; Woo et al., 2013; Kessler & Bikowski, 2010; Elola & Oskoz, 2010; Oskoz & Elola, 2014; Elabdali & Arnold, 2020) or via GD (e.g., Kessler et al., 2012; Abrams, 2016; Lawrence & Lee, 2017; Alharbi, 2019; Alkhateeb, 2020). These studies used the learners' editing that appeared in the revision history as the main source of data. Most of these studies quantified the frequency of learners' amendments manually. The vast majority of these studies were carried out at American universities, with ESL students (Kessler, 2009; Kessler & Bikowski, 2010; Kessler et al., 2012), FL Spanish learners (Elola & Oskoz, 2010), SL German students (Arnold et al., 2009, 2012; Kost, 2011; Abrams, 2016) or SL Arabic learners (Alkhateeb, 2020). Some were conducted with EFL learners at a Turkish university (Aydin & Yildiz, 2014), at a Chinese university (Li, 2013) and at a Saudi university (Alharbi, 2019), while others have been applied with learners of ESP (Bradley et al., 2010) at a Swedish university. Some studies have been carried out in the school context with EFL and ESL learners. (Lawrence & Lee, 2017; Woo et al., 2011; Alghasab, 2015; Woo et al., 2013; Mak & Coniam, 2008). These studies reported divergent findings regarding learners' revision behaviours. There is evidence

that students collaborate effectively in some research, while in other research students engage in a non-collaborative manner.

Regarding the assumption that students' attention to form when revising and editing joint texts indicates that they are collaborating and engaged in language learning, several studies show that the functions provided by Web 2.0 tools draw learners' attention to form while revising the joint text. For example, Kost (2011), Oskoz and Elola (2014), and Alghasab (2015) reported that when working with Wikis, students were able to prioritise form revisions over meaning revisions. In Kost's (2011) study, the researcher explored the strategies and revision behaviors employed by L2 learners of German while collaboratively writing an essay on a Wiki platform. The researcher confirmed that the Wiki environment enhances learners' writing review behaviour and encourages them to focus on form. Quantifying learners' contributions to the text mode of Wiki revealed that eighty-nine percent of the changes made by the learners were formal, and only 11% of the amendments were related to meaning. In addition, the intermediate-level learners in all the groups were able to produce long essays; however, the groups differed in the number of revision pages (some groups produced six times more than others). Similar results were obtained by Oskoz and Elola (2014). In this study, the researcher examined how online tools, specifically Chats and Wikis, facilitate L2 learners' collaborative Spanish writing. Analysing learners' revision behaviour quantitatively indicated that the real-time nature of voice communication allowed students to prioritise the global aspects of writing, such as content and organisation, and the editing feature of Wikis assisted students in focusing on the local aspects of writing, such as grammar and vocabulary, more than the global aspects (i.e., content). While the above studies attributed students' emphasis on form to Wiki features, Alghasab (2015) study, mentioned earlier, discovered that students in all groups tended to engage in more formal revision than in meaning revision when editing their texts through Wiki. She identified two reasons for the emphasis on form.

The first reason is the students' educational background, particularly in Kuwait, where English writing instruction frequently emphasises grammar rules. As a result, students may have become accustomed to prioritising formal aspects of writing, such as grammar and sentence structure, over delving deeply into the meaning and content of their texts. Furthermore, she observed that the teacher's example and instructions on how students should edit the text significantly impacted their attention to form. The teacher's instructions most likely emphasised the importance of correctness and adherence to grammatical rules, reinforcing the students' tendency for formal revisions.

Similarly, Lawrence and Lee (2017) and Alharbi (2019) used GD's revision history to examine students' writing processes and revision behaviours. Lawrence and Lee (2017) examined how Malaysian ESL learners with a low intermediate language proficiency level participated in collaborative writing using GD. The result indicated that GD facilitates recursive writing in the form of at least ten written drafts, allowing students to focus on form while writing. According to the researchers, the students' writing accuracy improved from the first to the last draft because their peers commented on most language-related errors. The researchers noted that within each group, one member was accountable for approximately half of the proposed changes. To estimate the students' proficiency levels, the researchers referred to their grades in the midterm exam. Interestingly, the student with the higher grade made significant formal changes. The researcher emphasised the necessity of teacher intervention to guide learners with diverse language proficiencies in collaborative writing, specifically through facilitating meaningful discussions during the text editing process. In Alharbi's (2019) study, mentioned earlier, analysing learners' revision practices quantitatively in the text mode of GD revealed that the majority of EFL Saudi learners' amendments (68%) dealt with local aspects, particularly grammar and word choice. In contrast, 32% of the text revisions aimed at improving the global aspects of writing,

encompassing content, organisation, and coherence. This suggests that the learners demonstrated a greater emphasis on form rather than meaning. While this study offered insights into the proportion of learners' revision practices, it did not specifically examine individual learners' behaviors. Analysing the distribution of revisions among learners would reveal if the revisions were made collaboratively or individually.

In contrast, Arnold et al., (2009), Mak and Coniam (2008), Woo et al. (2011), and Kessler (2009), reported that students contributed to the text by making many amendments that were related to meaning. In Arnold's (2009) study, the researchers examined learners' attention to form in both teacher-guided and unguided classes of German as a second language. The quantitative analysis of the students' Wiki pages indicated that in both classes, the majority of learners paid more attention to adding and deleting content than addressing grammatical and lexical errors. In the same vein, Mak and Coniam (2008) explored how Year 7 ESL learners in a Hong Kong secondary school utilise Wikis for collaborative writing purposes. The researchers quantified the editing practices of students by using Wiki archives. they found that the most observed writing act was the addition of new ideas, while the least frequently observed writing act was the editing form. According to the researchers, learners in this study worked independently without teacher support, potentially explaining their limited focus on form due to their young age and independent work. The researchers also suggested that the cultural background of Chinese learners prevented them from offering corrective feedback, as they were concerned about embarrassing their peers by exposing their errors. However, the researchers did not examine learners' perceptions of the activity, which could have provided further evidence to support their attributions. Similarly, Woo et al. (2011) examined the challenges and potential benefits of implementing a Wiki in a Hong Kong primary five English-language classroom for students and teachers. Data were collected from Wiki pages and questioners. The findings revealed that the most frequently observed revision act was the

addition of new ideas to content, and learners made numerous revisions to the content of their ideas. Based on the data collected by learners' and teachers' attitudes, learners' attention to meaning was attributed to the availability of spell checks on the Wiki and internet connectivity. The spell checks alleviated the cognitive load on students, enabling them to focus on the content. Likewise, the Internet provided abundant ideas and information, allowing the students to concentrate on reviewing and evaluating the content to extract the key points for their writing. In Kessler's (2009) study, the researcher examined the attention students paid to aspects of form such as spelling, punctuation, coordination, subject/verb agreement and prepositions in an autonomous online collaborative writing activity using Wiki. A high frequency of peer editing reflected the fact that they were confident about critiquing each other's work. However, the writers' editing concentrated more on meaning than on form. The participants (EFL pre-service teachers) were asked in interviews why they ignored grammatical editing, and they confirmed that even though they could correct grammatical errors, they preferred to ignore them since errors are not likely to affect the meaning. The researcher attributes the students' disregard for grammar mistakes to their lack of a teacher, which prevented them from seeking accuracy.

In another study by Kessler et al. (2012), the effect of GD on learners' revision behaviour was examined. Researchers analysed the texts the students had written together to determine the frequency and distribution of their revisions. They found that the students made more language-related (e.g., changes in form or adding and deleting text) than non-language-related changes (e.g., formatting and style changes). The result revealed that the simultaneous changes that GD makes possible during collaborative writing enabled the students to pool their linguistic resources and information. However, the finding indicated that learners focused more on meaning than form.

Studies by Kessler (2009), Arnold et al. (2009), Lee (2010), and Elabdali and Arnold (2020) found that when learners are involved in editing the joint text, their revision behaviour when they edit their own writing is different from when they edit their peers' writing. For example, Lee (2010) assessed Wiki-Mediated Collaborative in Elementary Spanish Courses at a US university over a period of 14 weeks. Data were collected from Wiki archives and interview. Lee reported that collaborative writing via a Wiki had a positive impact on L2 learners' writing and assisted them in becoming engaged in the scaffolding that occurred during revision, in that students assisted each other in organising the content and correcting grammatical errors. However, learners edited their own and their classmates' formal errors and avoided the meaning errors of others. The researcher believed the type of task (an open-ended task) encouraged the revision of the form. while the students' comments in interviews indicated that this was because they thought changing the meaning of other's ideas without permission was impolite. According to the study, instructors should assist students in revising their work and guide them in making effective use of feedback. The participants in studies by Kessler (2009) and Arnold et al. (2009) demonstrated similar behaviour. They seemed more willing to amend other's grammatical mistakes than to delete or change their ideas. However, learners engaged more in self-editing practices which were associated with meaning.

Although examining learners' attention to form or meaning is crucial for language learning, Bradley et al. (2010), Alghasab (2015) and Abrams (2016) argued that collaboration in the text mode goes beyond drawing learners' attention to form or meaning; it enables learners to engage mutually with each other's writing by modifying their own and other texts in terms of meaning and form. In their studies, the researchers found that learners' revision behaviours when they are working collaboratively extend beyond adding their own ideas to revising each other's texts to improve the ideas and correct grammatical errors. For example, Bradley et al. (2010) examined the impact of learners of interaction on learners' contribution to Wiki. The



participants were learners of ESP in Sweden university. The researchers analysed learners' Wiki pages and found that more than half of the learners' groups (15 out of 25) formed a collaborative pattern by adding ideas, correcting their own and other's language-related mistakes, and deleting and expanding each other's ideas. The researchers attributed the high proportion of students who engaged in collaborative behaviour to the collaborative nature of Wikis. Likewise, Alghasab (2015) noticed instances of students focusing on both form and content editing of not only their own writing, but also that of others. She argued that the collaborative interventional behaviour of teachers encouraged students to engage in each other's writing not only by correcting each other's grammar errors but also by refining and expanding each other's ideas.

In addition to high levels of learners' mutual engagement in each other's writing, Abrams (2016) identified collaborative work as characterised by an equal number of contributions from each group member. The purpose of his study is to examine the GD-mediated collaborative writing process among L2 learners of German in a US university. Analysing learners' contribution to the text mode of GD showed that four of the nine groups of students collaborated and exhibited high levels of mutuality and equality. The learners in these groups generated equal instances of contributions, engaged with each others' writing, elaborated on each others' ideas, and edited each others' form and meaning errors. However, the researcher did not investigate why only four out of nine groups demonstrated such an effective pattern. Similarly, Li (2014) conducted a study to explore how ESL learners with different L1 backgrounds collaborated on written tasks using a Wiki. Through a descriptive analysis of learners' revision behavior, the study found that some students made substantial mutual and equal contributions to the text, with students cooperating by engaging in the same amount of revision behavior. This included correcting each other's linguistic errors, adding, deleting, and expanding each other's ideas. The researcher proposed that these students adopted a

collaborative pattern because they had a common goal. Students stated in an interview that improving their L2 was their main objective when working together effectively.

Under the same assumptions as the above studies, Kessler and Bikowski (2010) and Arnold et al. (2012) reanalysed data from Kessler (2009) and Arnold et al. (2009) to determine whether students collaborated during their contributions to the Wiki text. In both studies, learners showed participation inequalities. In Kessler and Bikowski's study, 22 of the 40 students did not contribute to the text (editing the Wiki only once). The researcher attributed learners' reluctance to complete the task to the large group size, stating that some relied on others to complete the task. In Arnold et al.'s (2012) study, some students chose to become *free riders* by relying on others to complete the task, while others contributed less than fairly by being *social loafers*. However, the researchers suggested that learners' grammar revision behaviours showed two distinct patterns: in structured classes (where instructors provide feedback and guidance throughout the writing process), students formed a *cooperative* pattern in which they corrected their formal errors (61%) more than they corrected other's grammar errors; in unstructured classes (in which the instructor provides feedback at the end of the writing process), learners frequently (69%) edited the writings of their peers rather than their own, showing a *collaborative* pattern. In both classes, a *cooperative* approach to editing content (i.e., meaning) was evident. According to the researcher, this result is due to the directive feedback from the teacher. Instead of directing the feedback to all groups, the teacher offered language-related feedback to each student individually.

The *cooperative* pattern in learners' contributions to text was also observed in Alghasab (2015) and Kost (2011). A closer examination of learners' contributions in Alghasab's study showed instances of learners dividing the task. In this case, students write and edit their individual sections without engaging in other's text or accepting other people's edits. According to Alghasab, non-collaborative interventional behaviours by the teacher in this

group lead learners to follow this pattern. The teacher intervenes during learners' collaboration processes to encourage division of labour by instructing students to divide the task and work individually in their sections. Similarly, Kost (2011) observed that some students (one pair out of four) demonstrated a *cooperative* pattern, but instead of dividing the work, one student assumed the role of the writer and the other the role of the grammar checker.

In addition to the *cooperative* pattern, Bradley et al. (2010), Abrams (2016), and Alkhateeb (2020) demonstrated that learners followed another non-collaborative pattern while editing the text. According to Bradley et al. (2010), 10 out of 15 groups did not follow collaborative patterns. Five of these groups exhibited a *cooperative* pattern in which each member completed one section individually after the task was divided into subsections. In addition, the remaining five groups demonstrated *no interaction* pattern, in which one member wrote the entire essay while others did not contribute anything. Similarly, the analysis of learners' revision behaviours based on Storch's (2002) criteria of "equality and mutuality" in Abrams' study revealed that some of the learners adopted a non-collaborative pattern. Some of the students adopted a *sequentially additive* pattern of interaction, in which the learners produced the same amount of writing without evidence of mutual engagement in their editing practice. Others followed a *low pattern* of interaction, with some of the learners demonstrating a passive attitude towards producing collaborative text. Despite the fruitful findings of Bradley et al. (2010) and Abrams (2016), researchers in these two studies relied solely on text mode to examine the pattern of learners' interactions, leaving an incomplete picture of learners' levels of collaboration. Alghasab (2015) asserted that analysing learners' levels of collaboration using Web 2.0 tools necessitates an in-depth examination of learners' contributions in the two interaction modes available on these platforms (discussion and text modes). Alkhateeb (2020) and Elabdali and Arnold (2020), whose studies were discussed in

the preceding section, investigated both modes of interaction in GD and found that some students' interaction patterns changed from discussion mode to text mode. According to Alkhateeb (2020), two of the four groups behaved differently in text mode than in discussion mode. Despite involving them in a collaborative discussion, the students followed the *main editor* pattern in text mode, delegating the editing task to one student. While other learners followed a *cooperative* pattern in discussion mode, during the editing process, they employed an interactive editor pattern in which they edited each other's writing. The mode had no effect on the other two groups, as learners who adopted *collaborative/passive* roles in discussions also displayed *interactive/passive* editing patterns, in which two learners collaborated on editing while a third participant played the role of a passive editor. Students who used a *dominant/passive* pattern in the discussion also displayed a *main editor* pattern in the text, in which the dominant students wrote and edited the entire essay. Similarly, in Elabdali and Arnold's (2020) study, learners who collaborated in discussion mode engaged mutually in text mode with each other's writing; however, one learner maintained the role of the primary writer and leader, and performed a significantly higher number of revisions than other learners, resulting in an *expert/novice* pattern in text mode. In addition, learners who were *cooperative* in discussion mode engaged in a *dominant/passive* pattern in text mode, with one student exerting authority by dominating the editing process.

### **2.6.3 Learners' writing outcomes**

Studies that have examined whether collaborative writing through Web 2.0 platforms has an impact on learners' writing outcomes are relatively scarce. Among those that do exist, some have aimed to examine whether writing collaboratively using Web 2.0 tools helped learners to improve the quality of the collaboratively produced text (e.g., Strobl, 2014; Kuteeva, 2011; Elola & Oskoz, 2010). Others investigated whether patterns of interaction affect the quality of the text produced (e.g., Abrams, 2019; Li & Zhu, 2017; Alkhateeb, 2020; Elabdali &

Arnold; 2020), while other studies have attempted to find evidence of learning in subsequent individual performance (e.g., Bikowski & Vithanage, 2016).

Some of the studies were conducted with EFL or ESP learners at a Chinese university (Li & Zhu, 2011), a Swedish university (Kuteeva, 2011) and an American university (Bikowski & Vithanage, 2016; Alkhateeb, 2020), while others were conducted with learners of European languages such as learners of German (Strobl, 2014; Abrams, 2019) or Spanish (Elola & Oskoz, 2010). The conclusions drawn from these studies are inconclusive: some claim that using Web 2.0 tools to collaborate results in better writing outcomes, while others report contradictory findings.

Kuteeva (2011), Elola and Oskoz (2010) and Strobl (2014) investigated whether collaboration impacts the quality of text produced by learners. In Kuteeva's (2011) study, the qualitative analysis of the joint text produced by learners revealed a higher use of interpersonal discourse (e.g., engagement markers, hedges and attitude markers). The researcher suggested that the ability of learners to produce a text with a high level of accuracy was related to the fact that the affordances of a Wiki enhanced the students' audience awareness. In contrast, Elola and Oskoz (2010) conducted a quantitative analysis to compare the individual and collaborative texts using Wikis. they reported that there were no statistically significant differences in term of fluency, accuracy or complexity between the two texts. Similarly, Strobl (2014) compared the final product of collaborative and individual writing using GD. The statistical analyses indicated that there were no significant differences between the collaborative and individual texts in terms of complexity, accuracy or fluency. However, there were significant improvements in the collaborative text in terms of content and organisation.

Although both Elola and Oskoz (2010) and Strobl (2014) reported that there was no significant improvement in the collaborative text, the researchers in the two studies noticed some differences between the collaborative and individual groups in their writing process. The individual writers adopted a linear approach, while the group writers structured their essays and then adopted a recursive writing approach in the writing and editing stages. In Strobl's opinion, a recursive writing style enabled learners to review their work in depth, particularly with regard to meaning-related changes, resulting in a well-organised text.

Regarding the impact of the pattern of interaction on the collaborative text produced, Alkhateeb's (2020) study, discussed in sections 3.6.1 and 3.6.2, concluded that interaction patterns have no effect on the quality of the texts produced by learners. Elabdali and Arnold (2020) discovered that mutuality, rather than equality, determines the quality of joint texts. Students with high levels of mutuality, regardless of their level of equality in contribution, were able to improve the quality, but not the accuracy, of the joint text. The reason for this is that their mutuality is centred on discussing ideas rather than language.

Abrams (2019) and Li and Zhu (2017), on the other hand, examined the texts produced by learners in Li and Zhu's (2011) and Abrams's (2016) studies, discussed in sections 3.6.1 and 3.6.2, and concluded that the learners' interaction patterns have an influence on the quality of the texts produced. For example, Li and Zhu (2017) qualitatively analysed the texts produced by the three identified patterns of interaction in their previous study (*collaborative*, *authoritative/responsive* and *dominant/withdrawn*). The result indicated that learners who formed a *collaborative* pattern produced high-quality texts, particularly in terms of structure and coherence. Students who demonstrated an *authoritative/response* pattern, which is comparable to an *expert/novice* pattern, produced a good quality text, but it fell short of the collaborative text's quality, while the writing quality of those who displayed *dominant/withdrawn* was relatively low. The researchers attributed this finding to the fact

that learners working in a *collaborative* pattern have a sense of text ownership. In the same vein, Abrams (2019) also compared the quality of the collaborative texts produced by learners who formed different patterns of interaction while co-constructing the joint text via GD (e.g., *collaborative*, *sequentially additive* and *low*). A qualitative analysis of the texts produced by these different group dynamics in terms of complexity, accuracy, fluency, lexical diversity and propositional content indicated that learners who formed a collaborative pattern were able to write the highest-quality texts in terms of propositional content and coherence. However, the high levels of mutuality and equality in the collaborative pattern of interaction did not affect other aspects of writing, such as accuracy, fluency and lexical diversity.

It was obvious that studies of Strobl (2014), Li and Zhu (2017), and Abrams (2019) revealed that the collaborative condition leads to a higher quality text but not to higher levels of accuracy. This finding contrasts with the findings of studies of FTF collaboration, which claim that collaborative writing leads learners to achieve a higher level of accuracy in writing (e.g., Fernandez Dobao, 2012; Storch, 2005; Wigglesworth & Storch, 2009). According to Abrams (2019), the impact of online collaborative writing on quality rather than accuracy can be attributed to the fact that learners in online collaborative writing tend to prioritise meaning over form in their revision behaviour, as many earlier researchers observed (Kessler, 2009; Arnold et al., 2009; Kessler, et al. 2012; Kost, 2011).

Although the findings of Strobl (2014), Li and Zhu (2017) and Abrams (2019) provide evidence that collaborating effectively by interacting mutually through Web 2.0 tools enables learners to produce high-quality collaborative texts, these studies focused solely on the collaborative text the learners produced and did not examine the learners' individual writing in a subsequent performance to find evidence of learning. As mentioned previously the purpose of CL is not only to enable learners to co-construct a task that exceeds their

individual abilities; it is also designed to help them to develop their individual knowledge. Thus, learners' ability to produce a high-quality online collaborative text can be attributed to their reliance on each other's resources of knowledge in all stages of the writing process; however, their ability to produce a high-quality collaborative text cannot be taken as reliable evidence that their individual writing abilities will improve in the future.

There was only one study, by Bikowski and Vithanage (2016), which attempted to find evidence of learning in online collaborative writing by implementing a pre- and post-test research design. In this study, learners were divided into two groups (an experimental group and a control group). Each group engaged in four in-class GD writing tasks; however, the experimental group worked collaboratively while the control group worked independently. The researchers compared pre-test with post-test scores for both groups in terms of academic style, organisation and grammar in order to explore to what extent collaborative writing using GD supports ESL writers' outcomes. The findings indicated that the gains of both groups improved significantly; however, the GD-collaborative writing group had higher gains. Although this study can be considered to be the only study among all the online collaborative studies to have attempted to investigate the impact of online collaborative writing on learners' writing outcomes in subsequent individual performance, this study did not analyse learners' collaboration processes to provide evidence of collaboration.

Reviewing research that focused on discussion mode (section 2.6.1) or revision behaviour (section 2.6.2) demonstrates that simply asking learners to compose a text collaboratively using advanced technology tools does not ensure their effective collaboration. This can explain the contradictory results of the research that have examined the effect of collaborative writing using Web 2.0 tools on learners' writing outcomes (sections 2.6.3). According to Storch (2002, 2013) and Elabdali (2021), there is a strong and a logical link between the degree of learners' collaboration and the desired outcome of collaborative writing activities.



Therefore, in order to be able to claim that online collaborative writing has a positive impact on learners' individual writing outcomes, learners must engage collaboratively with the online collaborative task (Storch, 2002; Bradley et al., 2010; Li & Zhu 2017; Abrams 2019). According to the studies reviewed in sections 2.6.1 and 2.6.2, several factors may influence the level of learners' collaboration. The following section discusses these factors with a view to promoting students' collaboration.

#### **2.6.4 Factors which affect learners' collaborative writing using Web 2.0 tools**

Although the review of the studies regarding student collaboration in discussion and text modes suggested that writing collaboratively via Web 2.0 tools promotes students' collaboration, certain factors appeared to either facilitate or impede students' collaboration processes. Typically, these factors are associated with the type of task (Aydin & Yildiz, 2014; Lee, 2010; Abrams, 2016, 2019; Li & Kim, 2016), the group size and formation (Lee, 2010; Kessler, 2009; Arnold, Ducate, Lomicka et al., 2009), the affordances of technology (Alharbi, 2019; Abrams, 2016, 2019; Kessler, et al. 2012; Strobl, 2014; Li and Zhu, 2011; Alkhateeb, 2020). A number of factors related to the context, such as sociocultural and institutional factors, may also affect learners' collaboration (Arnold et al., 2012; Alghasab, 2015; Lee, 2010), as well as the presence of teachers or their intervention (Arnold et al., 2012; Kessler, 2009; Alkhateeb, 2020; Lawrence & Lee, 2017; Alghasab, 2015; Woo et al., 2013).

According to some studies, students' collaboration and participation can be influenced by the type of task. For example, Lee (2010) found that open-ended writing tasks resulted in greater collaboration among students. She observed that the nature of this task fostered participants' creativeness and enabled them to make frequent formal revisions. Aydin and Yildiz (2014), on the other hand, found that informative tasks did not get students to work together when compared to argumentative and decision-making tasks. In the informative tasks, students

were more likely to fix their own mistakes than those of others; however, in the argumentative essays and decision-making tasks, students were more likely to contribute to each other's ideas. Li and Kim (2016) analysed two groups of learners' data obtained by Li and Zhu (2011) to determine whether the interaction pattern differs between the two types of activities. The results suggested that the type of task affects learners' dynamic patterns of interaction, with learners following distinct patterns for each task.

The size and composition of groups also have an effect on learners' collaboration on some studies. For instance, Kessler (2009) found that a large group hindered students' contribution to the task. It was found that due to the high number of students in the group (i.e., 40) more than half of the group were reluctant to participate and relied on others to complete the task. In term of group formation, Arnold, Ducate, Lomicka, et al. (2009) observed that the assignment of group leaders affects students' collaboration. In their study, the leaders of each group developed distinct behaviours that influenced the actions of their members. In one group, the leader's behaviour fostered collaboration by employing an emotionally driven leadership style, but in the other group, the leader's behaviour impeded collaboration by adopting a more controlling and directive style of leadership.

The technical affordances of Web 2.0 tools have also been identified as a factor that may affect learners' collaboration in some previous studies. For example, Kessler, et al. (2012) and Alharbi (2019) mentioned that collaborating via GD promotes learners' contributions. Having the ability to preserve previous learners' work in revision histories enabled learners to edit and revise their work from any computer at any time. This indicates that collaboration among students was not constrained by class time. However, in Alharbi's study the researcher reported that Saudi EFL learners faced some difficulties in using GD, which affected their participation. Furthermore, Strobl (2014) found that simultaneous writing and editing through GD impact the learners' collaboration as it led to constant intertwining in all

stages of the collaborative writing process. Additionally, according to Alkhateeb (2020), the challenges associated with typing in Arabic using GD hindered the cooperation of L2 Arabic learners.

Factors that are shaped by context and prior language-learning experiences also hinder collaboration in some of the previous studies. These factors include perceiving writing as an individual activity, viewing teachers as a reliable source of feedback and social relationships. For example, Strobl (2014) found that 70% of students preferred the individual writing condition to the collaborative one, which influenced the level of collaboration in some groups. According to the researcher, the preference for independent writing may stem from familiarity and the belief that writing is primarily a solitary activity. In addition, Arnold et al. (2012) confirmed that students did not share text ownership. Most of the participants' contributions, according to the researchers, were focused on improving the grammar of their texts rather than revising each other's ideas. The authors suggest that such behaviour is a result of previous educational experiences in which L2 writing was primarily viewed as a means of gauging grammar knowledge. With Kuwaiti EFL learners, Alghasab (2015) reported that the nature of classroom activities that focused on individual writing assessments in Kuwaiti schools had a significant impact on student collaboration. She found that some groups of learners were unwilling to write collaboratively, preferring instead to write their assignments independently. According to Lee's (2010) study, a lack of confidence is also a barrier to collaborative editing. As evidenced by interview data, some students admitted that their doubts about their language proficiency prevented them from editing each other's work. In Lee's (2010) and Alghasab's (2015) research, learners rarely criticise or challenge one another's ideas because they value group harmony. According to Lee (2010), the comments made by students during interviews indicate that changing the ideas of others without their permission is considered impolite. Alghasab (2015) argued that while this behaviour may

improve student relationships, it may also minimise students' collaboration at the socio-cognitive level. Moreover, Lee (2010), Arnold et al. (2012) and Alghasab (2015) found that teachers' perceived superiority and authority have a significant impact on students' collaboration. According to these studies, students considered the instructor to be the most reliable source of information. Rather than relying on peer editing, students saw the teacher as the sole authority figure with the authority to make corrections. Furthermore, Alghasab (2015) mentions that students who care about their teachers often ask them for help and reassurance during the writing of the joint essay. They also try to impress them by writing in an individual and competitive way.

Other studies have also indicated that the teacher's presence or intervention impacts learners' collaboration (Arnold, Ducate, & Kost, 2009, 2012; Bikowski & Vithanage, 2016; Woo et al., 2013; Abrams, 2019; Alghasab, 2015, Lawrence & Lee, 2017; Kessler, 2009). Concerning the aim of the current study, this factor will be discussed in a separate section.

## **2.7 Teacher intervention**

Some researchers have advocated teacher intervention as an important factor in promoting student collaboration. For example, Kessler (2009), Bikowski & Vithanage (2016), Lawrence & Lee (2017), and Abrams (2019) recommend that a teacher be present during the collaborative process as a result of their observations that students make limited contributions. Kessler (2009), for example, found in his study that students exhibit certain behaviours due to the absence of the teacher that limit their level of collaboration, such as being reluctant to contribute to the joint text and avoiding correcting grammar mistakes. According to Bikowski and Vithanage (2016), students' reluctance to collaborate affects their performance and perception, so teacher attendance is essential to mitigate this reluctance. Moreover, Lawrence and Lee (2017) reported that long exposure to traditional, teacher-

centred learning activities leaves students unaware of the significance of collaboration in learning language. As a result, the researchers believe that a teacher should be present throughout the collaboration process to help students understand the value of collaboration by facilitating discussions and encouraging them to build on each other's ideas. Despite the positive conclusions reached in the preceding studies, the recommendations were based on an assessment of the limits of student collaboration rather than the presence of the instructor.

On the other hand, Woo et al.'s (2013), Arnold et al.'s (2012) and Alghasab's (2015) findings were derived based on the presence of the instructor. For example, Arnold et al. (2012) compared three classes: one unstructured, in which students worked autonomously, and two structured, in which the teacher was present to provide feedback throughout the collaboration process. Students in both structured and unstructured classes generated a similar number of revision behaviours, and regardless of the teacher's presence, some students did not contribute effectively and took on the roles of *social loafer* and *free rider*. Despite this, the results indicated that independent students were more likely to modify the texts of their peers than their own, resulting in a collaborative effort. In contrast, students in the other two structured classes concentrated more on refining and editing their own work than on engaging with the contributions of others. According to the authors, the teacher's behaviour in structured classes contributed significantly to this result. As a result of the instructor's criticism, students were encouraged to concentrate on their own writing rather than that of their classmates. Conversely, Woo et al. (2013) found that a teacher's behaviour promotes students' collaboration by fostering their participation. Using the timestamp feature of the Wiki, the researchers found that after teacher intervention, the number of students' contributions rose.

However, neither the Arnold et al. (2012) nor the Woo et al. (2013) studies focused on how teacher behaviour affects student collaboration; rather, these studies only considered

students' contributions. In contrast, Alghasab's (2015) study provided a more in-depth analysis of how teacher behaviour affects student collaboration. Alghasab focused on two levels of Wiki interaction, namely threaded discussion mode and text mode, to investigate how teachers' interventional behaviours promote student collaboration. An analysis of the teachers' interventional behaviours in three groups revealed that when the teacher used non-authoritarian and collaborative interventional behaviour, students were able to interact collaboratively not only by engaging in collaborative dialogue and joint scaffolding by becoming involved in organisational and socio-cognitive/effective interaction, but they were also willing to add to, expand on and correct their own and each other's texts. Based on the data obtained from student interviews, it appears that students place a high value on teacher intervention, without which collaboration would not have occurred naturally. On the other hand, students were able to participate but not collaborate through mutual interaction when the teacher used non-collaborative interventional behaviour (e.g., asking students to participate in an authoritative tone). Therefore, Alghasab argues that teachers' roles are essential in an online student-centred environment; nevertheless, in order to promote student collaboration, they should be trained in effective collaborative pedagogy. Despite Alghasab's (2015) research fruitful findings, she did not examine whether collaborative teachers' interventional behaviours affect learners' outcomes or not.

It therefore appears necessary to investigate the impact of teacher intervention on learners' outcomes based on two major reasons that have been identified in the literature. First, reviewing the literature on the outcomes of collaborative writing using Web 2.0 tools suggests mixed results; some studies suggest that learners improved their outcomes while most did not. Researchers found that significant improvement in learners' outcomes is associated with their level of collaboration (e.g., Donato 1988, 1994; Storch, 2002; Bradley et al., 2010; Li & Zhu 2017; Abrams 2019; Elabdali, 2021). Examining learners' collaboration

in the current literature, however, revealed that students do not always follow a collaborative pattern and non-collaborative patterns are prevalent among learners during the writing process of a collaborative text using Web 2.0 tools. Second, studies investigating the effectiveness of teacher intervention on promoting learners' collaboration, specifically the study conducted by Alghasab (2015), provide convincing evidence that if teachers intervene collaboratively, learners will engage in collaborative behaviour. However, these studies do not examine whether students' outcomes are influenced by teacher intervention or not.

An additional issue arises from evaluating the literature on online collaborative outcomes studies, particularly those aimed at obtaining evidence of learning in subsequent performance: research focuses solely on the outcomes and neglects the collaborative process. According to Storch (2013, 2019a), studies that explore the potential impact of collaborative writing activity on improving learners' writing outcome in an individual performance are scarce, in both the FTF context (only one study: Shehadeh, 2011) and in the online context (Bikowski & Vithanage's 2016 study); however, neither of these studies analysed the learners' collaboration process. Storch argue that focusing only on the outcomes provides an incomplete picture. In order to address this gap, the collaboration process and outcomes need to be examined jointly. The current study addresses these two important gaps namely, the impact of teacher intervention on learners' writing outcomes, and the methodological requirement to examine both processes of collaboration, outcomes, as well as learners' attitudes to identified the factors that may affect learners' collaboration. In this broader examination, a comprehensive picture of collaborative writing can be obtained.

This study focuses on how learners collaborate with teacher intervention rather than how the teacher intervenes. However, in light of Alghasab's (2015) argument that teachers should be trained in effective collaborative pedagogy in order to adopt collaborative interventional behaviours that facilitate collaboration among learners, it is necessary to highlight the online

collaborative behaviours that teachers should adopt to facilitate student collaboration and the online non-collaborative behaviours that teachers should avoid based on the findings of empirical research on online contexts.

Research findings are presented in the following subsection (sections 2.7.1 and 2.7.2) concerning teacher behaviour when mediating student interactions in online small-group collaborative activities. The purpose of presenting these studies is to (1) highlight online teacher collaborative behaviours that have been empirically proven to promote student collaboration in order to adopt them in the current study, and (2) highlight online teacher non-collaborative behaviours that have been empirically proven to hinder student collaboration in order to avoid them in the current study.

### **2.7.1 Online teacher collaborative behaviours**

A number of studies have demonstrated that the teacher is a crucial facilitator of student collaboration in an online context (Lamy & Goodfellow, 1999; Maor, 2003; Pawan et al., 2003; Shield, Hauck, & Hower, 2001; Zhao & Sullivan, 2017; Weasenforth, Biesenbach, & Meloni, 2002; Mazzolini & Maddison, 2003, 2007; Alghasab, Hardman & Handley, 2019). In accordance with the findings of the previous studies, teachers can promote students' collaboration through adopting cognitive interventional behaviour, cognitive/social behaviours, and by limiting the number of teacher posts.

A teacher's cognitive interventional behaviour involves the use of pedagogical interventions to facilitate and direct students' cognitive processes by providing feedback and asking questions with the purpose of promoting their collaboration. For example, Zhao and Sullivan (2017) reported that the instructor's initial postings and responses helped establish examples of postings and replies. After three weeks, students were accustomed to online discussion and their collaboration level had increased. Similarly, at the beginning of their study,



Weasenforth et al. (2002) found that students' comments tend to be more superficial due to teachers' role as observers. However, during the middle and final phases of the study, there was an opportunity for students to participate in productive discussion because the teacher adopted cognitive interventional behaviour. This behaviour consisted of modelling the preferred manner of discourse, offering ideas and using probing questions to stimulate a discussion between students.

Teachers' cognitive intervention in the form of explicit instructions has also been identified as an effective method for promoting student collaboration. A study by Maor (2003) shows that students posted their work without seeking additional feedback from each other at the initial phases of online activity; however, students only began referencing and criticising one another's work after the teacher intervened and provided explicit direction on how to collaborate effectively. In the same vein, Pawan et al. (2003) found that providing explicit instructions to guide students through probing questions and modelling critical thinking in a less authoritative manner facilitated students' collaboration. The researchers concluded that teacher behaviour influenced the quality rather than the quantity of learners' interactions. Students were able to build on each other's ideas and come up with a solution to a problem together. In Kwon et al. (2019), perspective-widening comments have been shown to improve students' ability to construct knowledge when a teacher proposes alternative or challenging viewpoints regarding the original message. This encourages students to evaluate each other's ideas and initiate new discussions, while teachers' elaboration-encouragement comments promote learner interaction by asking students to elaborate on each other's contributions.

Regarding the implementation of cognitive and social strategies, Lamy and Goodfellow (1999) and Shield et al. (2001) emphasised the need for a teacher to incorporate cognitive and social behaviours. In both studies, it was found that teachers' cognitive behaviour, such as

encouraging discussion about language knowledge, improved students' language accuracy, while Shield et al.'s (2001) study demonstrated that students' fluency can be enhanced through teacher's social behaviour. Although Lamy and Goodfellow have found that teachers' social behaviours contribute to off-task conversations among their students, he emphasises that teachers should always include both cognitive and social interaction during their intervention with students.

To adopt both cognitive and social behaviour simultaneously, Alghasab, Hardman and Handley (2019), and Zhao and Sullivan (2017) argue that a dialogic, rather than a directive approach, is required. For example, a closer examination of teacher moves and student actions/contributions in Alghasab, Hardman and Handley's (2019) study, revealed that one teacher among three promoted a dialogic Wiki environment by adopting both cognitive interventions that improved students' fluency and accuracy, as well as social behaviours that established a social community among students. Collaborative behaviours such as setting ground rules for collaborative work, encouraging collaborative construction of meaning and form, and praising collaborative efforts by learners contribute to the creation of an open social space for dialogue that facilitates joint thinking and co-construction. However, behaviours such as giving formative feedback and suggesting resources play a significant role in guiding the writing process and supporting students in discussing and resolving problems on their own.

The number of teacher posts should also be minimised in order to facilitate student collaboration, as well as creating a space in which students can interact with one another. Mazzolini and Maddison (2003, 2007) found that teachers intervened in students' collaborative activities using two different styles. In the first style, which the researchers termed 'sage on the stage', the teacher frequently participates in the discussion and plays a leading role, while in the second style ('guide on the side'), the teacher guides the discussion

from the side, intervening students are reluctant to discuss, in order to promote collaboration without being controlling. According to the researchers, adopting the ‘sage on the stage’ style of intervention led learners to contribute little to the discussion. On the other hand, students engaged in constructive discussions with a teacher who acted as a guide on the side, because the teacher provided an opportunity for students to share their ideas by not dominating the discussion. Similarly, Zhao and Sullivan (2017) and Alghasab, Hardman and Handley (2019) emphasised that minimising teacher intervention is an effective behaviour that promote learners’ collaboration. According to Zhao and Sullivan’s (2017) analysis of learners’ discourses and their teachers’ interventions, the less teacher’s presence resulted in more peer interaction as well as instances of cognitive interaction and knowledge co-construction. Likewise, Alghasab, Hardman and Handley (2019) showed that teacher intervention decreased significantly from 12 interventions in week 1 to 7 interventions in week 4 and just 1 intervention in week 8. As a result of this gradual reduction, students’ participation and interaction increased. There were 9 contributions by learners in week 1, 20 contributions in week 4 and 30 contributions in week 8. Both Zhao and Sullivan (2017) and Alghasab, Hardman and Handley (2019) concluded that gradually minimizing teacher intervention helped students reduce their reliance on teachers and raise their confidence and independence so that they could handle and solve difficulties on their own.

### **2.7.2 Online teacher non-collaborative behaviours**

According to some studies, some teacher behaviours impeded rather than promoted student collaboration (e.g., Pawan et al., 2003; Mazzolini & Maddison, 2003, 2007; Zhao & Sullivan, 2017; Alghasab, Hardman, & Handley, 2019). Based on the findings of this research, it appears that teachers can negatively affect the process of online collaboration between learners by: (1) adopting directive approach and (2) adopting authoritative role.

Adopting a directive approach, such as acting as a monitor and providing direct feedback, has been identified as a non-collaborative behaviour that hinders learners' collaboration. For example, according to Pawan et al. (2003), some teachers failed to engage actively in students' collaboration. Instead of engaging students through questions to promote collaboration, teachers provided comments to students, which are acknowledged and affirmed by the students. Similarly, Alghasab, Hardman and Handley (2019) also revealed that two teachers out of three adopted a directive approach. There was no visible interaction between students in these classes, and students relied heavily on their teachers' instructions and wrote concurrently. This is because teachers provide one-on-one feedback, assume the roles of monitors and editors, and also direct students in the writing process.

In addition, adopting the authority's role impeded the interaction among learners. A study by Pawan et al. (2003) found that some students were not able to collaborate effectively due to the traditional and authoritative role assumed by teachers, as well as the lack of encouragement they received. The two teachers mentioned in Alghasab, Hardman and Handley (2019) also interacted with students in an authoritative manner. As a result of the interview data, it became evident that these two teachers viewed themselves as authorities who were responsible for monitoring and prescribing the content and form of written tasks.

## **2.8 Summary**

A key aim of this chapter is to introduce SCT, which presumes that language learning is the result of social interaction. It also suggested that collaboration in collaborative writing activities contributes to language learning. In addition, this chapter focused on the role played by the online medium of interaction in facilitating and promoting collaboration among L2 learners. It suggested the use of Web 2.0 tools (i.e., GD) in collaborative writing activities in order to facilitate student interaction. A number of studies have demonstrated that Web 2.0

tools promote L2 learners' collaboration in discussion and text modes, as well as providing numerous opportunities for them to engage in language learning. Despite its role in promoting learners' collaboration, empirical evidence suggests that learners may engage in a non-collaborative pattern of interaction while using these advanced tools. This fact impacts negatively on learners' improvement in language-learning outcomes. Following this, the chapter discussed the factors that may affect L2 learners' collaboration. Considering the aim of the study, teacher intervention among these factors was discussed in detail. Following this discussion, this chapter presented two major gaps: (1) the necessity of investigating the impact of collaborative writing with teachers' intervention on L2 learners' outcomes, and (2) the need for examining both processes and outcomes to provide a comprehensive picture of the impact of collaborative writing. Therefore, this thesis's aim was to investigate how collaborative writing with teacher intervention affects the learning outcomes of EFL learners. This investigation was done by comparing learners' collaborative writing with and without teacher intervention in terms of level of collaboration, outcomes, and attitudes. To achieve this objective, the following research questions were proposed:

1. Will Saudi university EFL students who are engaged in GMCW with teacher intervention improve their writing outcomes in subsequent individual performance more than those who are engaged in GMCW without teacher intervention?
2. To what extent do Saudi EFL students collaborate when they engage in GMCW with teacher intervention, compared with those who collaborate in GMCW without teacher intervention?
3. Do differences in learners' patterns of interaction result in different writing outcomes?
4. What are students' perceptions of GMCW in the groups that have teacher intervention, compared to the groups that do not have such intervention?

## **Chapter 3 Methodology**

### **3.1 Overview**

In the previous chapter, research related to the study was discussed. In this chapter, the research methodology is discussed in detail in order to illustrate how it was applied to answer the research questions and achieve the research objectives. A pragmatism paradigm was adopted in order to examine how collaborative writing can improve learners' individual writing outcomes using GD with teacher intervention. This is because it provided an opportunity to follow a cyclical process of deduction and induction when examining the hypothesis of this study (section 3.2). Section 3.3 explains that a mixed-methods approach was deemed to be the most appropriate research strategy for answering the research questions. The population for the study and the justification for selecting an appropriate sampling method (convenience sampling) is described in section 3.4. The research design (i.e., experimental design) and the design used in implementing pre- and post-tests (counterbalancing) are discussed in section 3.5. The materials used in the study as well as the research methods used to collect data (instruments: pre-tests, post-tests, tracking the students' collaboration process via GD and interviews) are discussed in section 3.6. Description of the study procedures are provided in section 3.7. Section 3.8 describes the procedures employed to analyse the data, and then a detailed analysis of each approach to data analysis is provided. The piloting stage that preceded the main study is discussed in section 3.9, while issues of reliability, validity and ethics are addressed in section 3.10.

### **3.2 Research paradigm**

Due to the current study's focus on resolving learners' writing issues, a mixed-methods approach was used to give a comprehensive picture of the intervention's effects. Therefore, this study can be said to fall into the Pragmatism paradigm. According to Maxcy (2003), pragmatism as a research paradigm aims to come up with practical solutions to real-world problems. Pragmatists have a different approach than positivists and constructivists when it comes to acquiring knowledge. While positivists believe that objective knowledge can only be obtained through empirical evidence and hypothesis testing, and constructivists believe that knowledge is subjective and reality is too complex to comprehend fully, pragmatists view the acquisition of knowledge as a continuum rather than a clash of objectivity and subjectivity (Goles and Hirschheim 2000). When a research problem has multiple layers, employing multiple methods to measure and observe these layers is necessary; thus, pragmatists reasonably and practically analyse their data through the use of various methodological combinations to tackle the research issues (Feilzer 2010, Patton 2002). Therefore, there is a consensus among researchers that mixed-methods research should adopt a pragmatic approach. Pragmatism offers a flexible research approach that combines both quantitative and qualitative methods, unlike positivism, which mainly emphasizes quantitative techniques and follow a deductive logic, and constructivism, which favors qualitative techniques and follow inductive logic (Feilzer 2010; Morgan 2007; Pansiri 2005). Pragmatism involves a cyclical process of deduction and induction, where the researcher actively generates data and develops theories (Goldkuhl, 2012; Morgan, 2007).

The choice of this paradigmatic stance was appropriate for the current study, as this research utilises mixed methods and employs multiple sources of data and knowledge to answer research questions. The main hypothesis in the current study is that collaborative writing using GD with teacher intervention will improve language-learning outcomes. Using

quantitative methods (pre- and post-tests) in the current study allow the researcher to examine the hypotheses and provide empirical evidence about the impact of the intervention. Furthermore, understanding how the intervention impact learners' collaboration necessitated elaboration and clarification. This was achieved by qualitative analysis for the participants' social reality (i.e., their online collaboration process) and understanding participants' views and beliefs ((i.e., interviewing them). Thus, the pragmatic paradigm was perceived to fit with the current research's objective to investigate the effects of GMCW with teacher intervention on EFL writing outcomes because this study not only examines the hypothesis and provides practical evidence but also explores how learners collaborate as well as how their beliefs and experiences shape results (Morgan 2013).

### **3.3 Research strategy**

Various research methods have been used to investigate whether the use of GMCW improves the writing outcomes of EFL students, and the extent to which this Web 2.0 tool promotes student interaction when writing the joint text. The main methods used in previous research studies included analyses of the collaboratively produced texts (Abrams, 2019; Strobl, 2014; Alkhateeb, 2020), using pre- and post-tests to examine students' writing abilities (Bikowski & Vithanage, 2016), tracking the students' revision behaviour to investigate their language focus or their pattern of interaction (Abrams, 2016; Alharbi, 2019; Kessler & Bikowski, 2012; Lawrence & Lee, 2017; Strobl, 2014; Alkhateeb, 2020) and observing the students' discussion in the GD comments to examine their language focus and patterns of interaction (Alharbi, 2019; Alkhateeb, 2020; Kitjaroonchai & Suppasetseree, 2021). While some studies have focused on learners' outcomes (Abrams, 2019; Bikowski & Vithanage, 2016; Strobl, 2014), others have paid attention only to learners' interaction (Abrams, 2016; Alharbi, 2019; Kessler & Bikowski, 2012; Lawrence & Lee, 2017; Kitjaroonchai & Suppasetseree, 2021). In



the present study, the learners' outcomes, the collaboration process of the EFL Saudi learners and their perceptions of collaborative writing using GD were investigated. This explored the potential impact of collaborative writing using GD with teacher intervention on promoting collaboration and writing outcomes in individual performance. Therefore, a mixed-methods approach was employed for collecting data in this study. The quantitative method looked at pre- and post-test written tasks and frequency counts (i.e., the number of times the students engaged in the collaboration process). The qualitative method analysed extracts of students' discussions and learners' interviews. The rationale behind using a mixed-methods approach was that the researcher can obtain valid and accurate data on exploring the development of language-learning outcomes. A mixed-methods approach was deemed to be essential for collecting valid and solid evidence relating to the use of the intervention (Cohen et al., 2008; Greene, Caracelli & Graham, 1989; Torrance, 2012). In other words, using only one method to explore the impact of online collaborative writing on language-learning outcomes could "inevitably yield biased and limited results" (Greene et al., 1989, p. 256). When using a mixed-methods approach, the strength of one method compensates for the weakness of the other (Robson, 1993). Therefore, given the fact that each method serves to complement the limitations of the other, it was appropriate to employ triangulation of data for finding evidence about language-learning outcomes of GD-mediated collaborative writing activities.

For clarification, examining learners' individual outcomes through pre- and post-testing alone cannot provide a complete picture of the impact of online collaborative writing on improving language-learning outcomes. Storch (2013) emphasises that focusing on the learners' outcomes and neglecting their interaction in collaborative writing-outcome research provides only half the picture. She reports that to understand why collaborative writing may or may not lead to language-learning gain, the learners' collaboration process must be analysed because it not only mediates learners' development but also reflects the process of their

development. Thus, to obtain a complete picture and ensure the validity of the data collected by assessing learners' outcomes in individual subsequent performance via pre- and post-tests, the learners' collaboration process was investigated to determine the extent to which it influenced their outcomes. In examining the learners' collaboration process, the frequency counts – the number of times the students engage in the collaboration process, was useful in measuring the level of equality in the students' contribution to the task and provided an overall perspective of their online collaboration. However, showing the extent to which learners are willing to offer and engage with each other's contributions cannot be easily identified through quantifying learners' contributions. Thus, besides quantifying learners' collaborative behaviour it was also necessary to analyse qualitatively some extracts of the students' discussions in order to determine the level of mutuality in the learners' discourse. Although examining the learners' outcomes in individual subsequent performance and tracking students' collaboration provides strong evidence of the impact of collaborative writing using GD on learners' writing outcomes, they cannot reveal the learners' views on the activity and the factors influencing their collaboration. This is important in “understanding the learners' observed behaviour and language-learning outcomes of collaborative writing activity” (Storch, 2013, p. 117). Herring (2004) points out that an online text gives clear and reliable evidence of the writer's behaviour, but not what the writer felt and thought. Consequently, interviews were used to explore the learners' experience of and reflections on their online collaboration via GD. Pawan et al. (2003) report that an additional source of data can be obtained from student interviews, which can provide insight into factors affecting online collaboration among students.

### **3.4 Sampling**

The quality of a research study depends on the selection of appropriate instruments and of an appropriate sample (Cohen et al., 2018). Because of a variety of factors such as accessibility and time, it was not easy to collect data from the whole population. The current study was conducted in the English Language Department (ELD) at Al Qassim University, Saudi Arabia. There are around 300 students in the department. For the purposes of collecting data, a small number of subjects that represent the whole population should be selected (Cohen et al., 2018). According to Cohen et al. (2018) and Bryman (2011), there are two types of sampling: probability sampling means that each participant has an equal chance of being nominated to be involved in the study, and non-probability sampling means that some participants have more chance of involvement in the study than others. There are five types for the non-probability sampling: (1) purposive or judgemental sampling, (2) a sample of convenience, (3) restrictive sampling, (4) quota sampling and (5) a sample of volunteers (Wu & Chen, 2006). The researcher preferred to recruit a number of classes to the study (e.g., a split class) to avoid class or cluster effects by allocating half of the first class to the experimental condition and the other half to the control. Because of COVID-19 and institutional constraints, this was not feasible. Therefore, convenience sampling that is under the non-probability sampling approach was used to collect data to help answer the study's research questions.

Once permission has been obtained from Al Qassim University in Saudi Arabia to collect data from EFL students at the ELD, the researcher selected the sample to be recruited from students in the third level that comprises two classes, for three reasons:

1. Students are in the same level: they are lower-intermediate adult EFL students aged between 19 and 22. They have less experience of studying English in general, and specifically writing skills, than students in the upper levels (e.g., levels 6, 7 and 8).
2. The syllabus of the writing course in the third level focuses on teaching writing skills through stages, namely: pre-writing, revising and editing. This assisted the researcher in determining whether CL using GD improved the writing ability of the Arabic EFL students.
3. The primary objective of the course is to teach students how to compose an essay of three main types (e.g., argumentative, cause-and-effect, advantages and disadvantages).

The researcher endeavoured to ensure that the sample of students selected was representative of all the students in the ELD so that the results of the research could be generalised to all the students in the department with a high degree of confidence.

The total number of students in the two classes of level 3 was 49. An experimental group of 24 students was represented by one class, while a control group of 25 students was represented by the other class. However, three students withdrew from the course in the control group, so the remaining number of students that engaged in the study was 46, as shown in Table 3.1.

**Table 3.1** Participant numbers

Groups	Participants
Experimental condition	24
Control condition	22

The two groups needed to be similar to each other before conducting the study. Dornyei (2007) states that “from a theoretical perspective, the ultimate challenge is to find a way of making the control group as similar to the treatment group as possible” (p. 116). During the

experiment, the researcher should ensure that both groups are equal (Mitchell & Jolley, 1988). Even though there was inevitably some variation in the students' levels of proficiency, however, the two groups were at the same level, their average ages were 21, they were taught three hours a week with the same curriculum. In addition, their backgrounds were very similar since they are from the same context and the same gender. Besides that, the pre-test in both conditions helped the researcher to confirm whether their scores were similar in terms of proficiency before conducting the study.

### **3.5 Research design**

The present research consisted of a pre-test, the treatment and a post-test. It included two groups of Saudi university EFL students in level 3 at the College of Arts and Sciences of Al Qassim University in Saudi Arabia. As mentioned above, the total number of students in level 3 was 46, distributed into two classes; one represented the experimental group and the other was the control group. Thus, taking pragmatic as the research paradigm, a quasi-experimental study design was employed. The current study explored whether the writing outcomes of Saudi EFL students engaged in collaborative writing using GD with a teacher intervention improved more than those of the students involved in the collaboration without a teacher intervention. Thus, the use of an experimental approach was deemed appropriate. According to Cohen, Manion and Morrison (2018), in experimental and quasi-experimental research, an intervention is introduced, and the researcher then measures the difference it has made. The current study consisted of teaching writing skills to two groups of students using the following stages of the writing-process approach: pre-writing, revising and editing (see section 2.4.1 for more details). The students in the first group were taught using GMCW with teacher intervention, while the students in the other group were taught using GMCW without teacher intervention, as shown in Table 3.2.

**Table 3.2** Treatments and tests

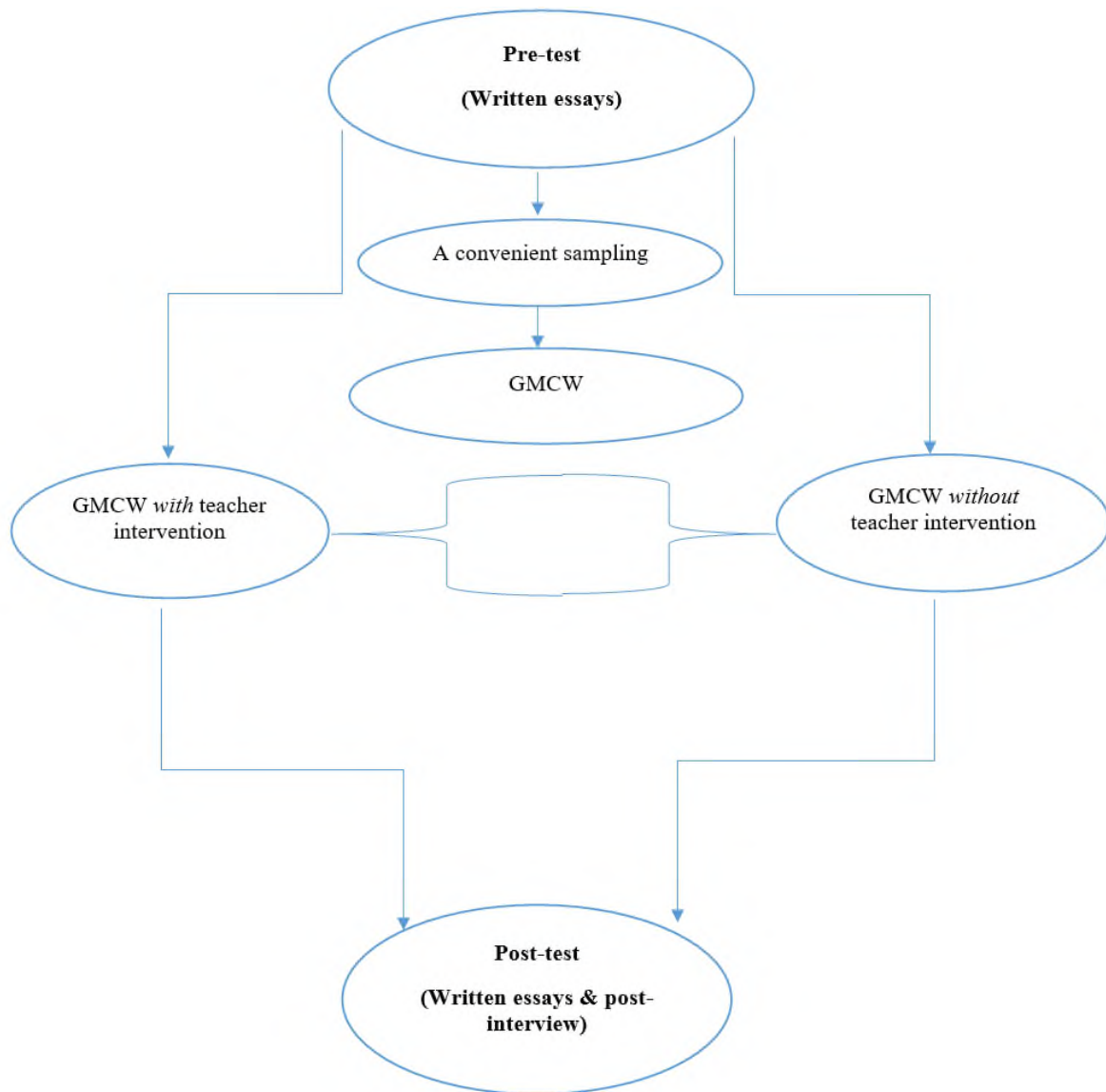
Groups	Pre-test	Treatment	Post-test
Experimental condition	O	GMCW with teacher intervention	O
Control condition	O	GMCW without teacher intervention	O

According to Campbell and Stanley (1963), (O) measures the impact of the treatment before and after involvement in the study. The following reasons illustrate why this study can be described as quasi-experimental:

- Researchers believe that both true experimental and quasi-experimental research can be used to investigate cause–effect relationships between independent and dependent variables.
- In both true experimental and quasi-experimental research, a group of participants is given a treatment. Their results are then compared with those of another group of participants who are similar, apart from the fact that they have not received the treatment (Dornyei, 2007). In true experimental research, participants are randomly assigned to control and experimental conditions. However, in the current study, random assignment of participants is limited, making it a quasi-experimental study. This limitation may affect the generalizability of results beyond the study’s specific groups and the ability to establish causality. According to Rogers and Revesz (2019), researchers of applied linguistics often want to test teaching methods in real-life learning environments. As a result, it may not be possible to randomly assign students to different groups due to practical and ethical considerations. Although the lack of random assignment may limit the study’s generalizability, researchers should still consider practical constraints and ethical concerns (Rogers and Revesz, 2019). In this study, due to COVID-19 and the institutional constraints in the Saudi university

context, the researcher used a convenient sampling design to collect the study's data (see section 3.4. for more details).

- The researcher in both true experimental and quasi-experimental research must have the authority to expose their participants to various experimental conditions and to maintain control over any variables that might affect the behaviour of the subjects (Blaxter, Hughes & Tight, 1996). In this study, the researcher is a member of staff in the college where the study was conducted, so she has sufficient authority and knowledge of the students' abilities to ensure that all the students in the class were eligible to be involved in the study, and that the intervention was suitable for all the students taking part. A diagram of experimental design is provided in Figure 3.1.



**Figure 3.1** Experimental design

The key dependent variables of the research design are the students' writing outcomes, the level of collaboration and attitudes towards GD-mediated collaborative writing. Development of that was measured through pre-post-tests, tracking the learners' collaboration process and follow-up interviews.

After assigning the first class as the experimental condition (GMCW with teacher intervention) and the second class as the control condition (GMCW without teacher intervention), pre-tests were completed and collected to measure learners' writing abilities.



Before starting the intervention, the teacher and all the students engaged in a technical session and received training in how to use GD when practising writing skills. The session covered features of GD, such as creating an account in Gmail, logging into an account, writing, posting, revising, editing and accessing the page history (see appendix B & D). Furthermore, the teacher was trained on how to foster students' collaboration. This was done by giving him an intervention handout that depicted collaborative and non-collaborative interventional behaviours. The teacher should intervene to encourage student collaboration by promoting the exchange of cognitive feedback and creating a nonthreatening GD environment. However, Teachers must limit the number of posts to allow students to interact with one another (for more information see appendices C & E).

Regarding the task used in the pre- and post-tests, two parallel versions of a composition essay were selected from the students' textbook (*Effective Academic Writing-III*, Jason, Davis & Rhonda Liss, OUP 2006; Unit 4: Argumentative Essays) (see appendix A). A selection of tasks was taken from authentic ESL teaching textbooks to ensure they were compatible with the students' level (Jones & Williams, 2004; Kehe & Kehe, 2011; Keller & Warner, 2002; Mariani, 2010; Ward, 2010), and to make sure that both tests matched and elicited similar language in terms of grammar and vocabulary. Selecting these two parallel versions served the purpose of controlling any test effects, or the possibility that the students may have acquired any knowledge or learning from the pre-test to the post-test.

With regard to the strategy utilised in applying the pre- and post-tests, a counterbalancing strategy was adopted to neutralise any test effects related to the task achievements (Haslam & McGarty, 2014; Marsden & Torgerson, 2012), in which the two parallel versions of the tests (an argumentative essay) were employed. After dividing the students into two conditions (convenience sampling), half of the students at the pre-test in both groups were assigned to write an argumentative essay (A), and the second half of the students wrote an argumentative

essay (B). In the post-test, an argumentative essay (B) was completed by the first half of the students in both groups, and an argumentative essay (A) by the second half of the students. The purpose behind using this design is to neutralise any test effects related to the order and equivalence of these tests (Haslam & McGarty, 2014). The next table shows the rotation process over the two tests times.

**Table 3.3** Rotating the two versions (A and B)

Groups	Allocation participants alphabetically	Pre-test	Post-test
<b>Experimental</b>	12 students	A	B
	12 students	B	A
<b>Control</b>	11 students	A	B
	11 students	B	A

Given the aims of the current study, assessing students was done at the individual level in pre- and post-tests, while the intervention was undertaken at group level, as shown in Figure 3.2.



**Figure 3.2** Individual and group levels diagram

Having reviewed the literature on the impact of online collaborative writing on improving learners' writing abilities, it has been found that the majority of the research on L2 collaborative writing outcomes (e.g., Abrams, 2019; Elola & Oskoz, 2010; Fernandez Dobao, 2012; Kuteeva, 2011; Li & Zhu, 2017; Malmqvist, 2005; Storch, 1999; Storch, 2005; Storch

& Wigglesworth, 2007; Strobl, 2014; Storch & Wigglesworth, 2007; Wigglesworth & Storch, 2009; Elabdali & Arnold, 2020) assessed learners' writing abilities at the collaborative level. These studies reported that collaboration provides learners with the opportunity to rely on each other's linguistic resources and to co-construct a high quality of collaborative joint written text. However, as previously discussed (in section 2.6.3) the impact of collaboration from the perspective of SCT extends beyond the quality of learners' collaborative texts to the improvement of individual writing skills. In other words, the assistance provided by learners at group level, which is known as 'scaffolding' in the literature, does not only help them to complete the task that is beyond their individual abilities – it also provides them with an opportunity to co-construct new knowledge that, when internalised, enables them to perform the difficult task individually in the future. Thus, to investigate the impact of collaborative writing on improving individual writing abilities, it is essential to assess learners at an individual level to find evidence of learning.

Previous studies of collaborative writing outcomes have revealed inconclusive findings (e.g., Bikowski & Vithanage, 2016; Kim, 2008; Kuiken & Vedder, 2002; Nassaji & Tian, 2010; Shehadeh, 2011; Storch, 2002; Swain, 1998). Some studies provide evidence of gains (e.g., Bikowski & Vithanage, 2016; Kim, 2008; Shehadeh, 2011), while others argue that the conditions for effective collaboration do not always occur in learners' groups. Storch (2002, 2001, 2013) points out that the nature of the group's collaboration, that is, whether they engage in a collaborative pattern or not, determines their improvement in individual performance in the future.

Based on the above discussion, the researcher in this study investigated to what extent online collaborative writing with teacher intervention affected EFL learners' writing outcomes in subsequent individual performance. This was achieved by making a comparison between two different conditions (GMCW with teacher intervention in the experimental condition, and

GMCW without teacher intervention in the control condition). In both the experimental and the control conditions, the intervention was undertaken at the group level in order to expose learners to the potential benefits of collaborative writing. Writing collaboratively in a group provided an opportunity for the learners to engage mutually in a collaborative dialogue in which they could exchange reciprocal feedback and access each other's linguistic resources to collectively scaffold each other while co-constructing the online joint text. However, the role of the teacher in the experimental group was to facilitate L2 learning by promoting the students' collaboration. The teacher was able to intervene collaboratively, to support the learners and encourage them to engage in collaborative behaviour (e.g., providing feedback, expanding on each other's ideas) in order to facilitate collective scaffolding among them. After giving the learners, the opportunity to take part in several collaborative writing activities, the researcher assessed their writing outcomes at an individual level. Assessing the learners provided empirical evidence about the impact of collaboration on learners' individual performance. As a result of the teacher fostering collaboration, the learners who were engaged in GMCW with teacher intervention were expected to improve their writing outcomes more than those who were engaged in GMCW without teacher intervention. To confirm that and to crosscheck the validity of data collected by assessing learners' individual outcomes, the learners' collaboration process in both conditions (experimental and control) was analysed.

## **3.6 Data collection**

### **3.6.1 Material**

As discussed previously (in section 3.5) this study compared the impact of GMCW with teacher intervention and GMCW without teacher intervention on learners' writing outcomes.

The materials used, such as the GD-collaborative platform and students' training collaborative writing tasks, are discussed in the next sections.

### **3.6.1.1 The GD-collaboration platform**

GD was chosen over other collaborative platforms for two purposes. First, following a comparative analysis of technical features of different collaborative platforms used in the literature, it became clear that the affordances of GD make it an effective collaborative platform for students and a pedagogical tool for teachers (for more details see section 2.6). Second, although GD is the only platform that supports the synchronic communication feature, few studies of L2 collaborative writing used GD as a collaborative tool. According to Storch (20019b) the nature of learners' interactions in synchronous platforms such as GD needs to be investigated.

### **3.6.1.2 Teacher intervention**

One of the important materials used only with experimental small groups is the intervention of the teacher. Thus, it is essential to mention the rationale behind choosing this teacher in particular. The teacher is an associate professor in the Department of English Language, at Qassim University, Saudi Arabia. He has a PhD in applied linguistics from the University of Newcastle upon Tyne in the United Kingdom and holds an MA in Applied Linguistics from Kansas University in the United States. He has extensive experience in teaching English as a second language, with a particular emphasis on writing skills. His research is focused on academic writing, second language acquisition, discourse analysis, and computer-assisted language learning and teaching. His primary area of interest is second language writing, and he has published several articles on collaborative writing.

### 3.6.1.3 Students' training in collaborative writing tasks

Every three weeks the students in both groups (experimental and control) were given a topic and asked to write in small groups a collaborative essay using GD. The tasks in this study are composition tasks; they correlate with the students' curriculum that requires them to compose their essays following the process approach to writing (pre-writing, revising, etc.). They are also effective for collaborative writing because they draw the students' attention to all the aspects of writing, such as structure, vocabulary and mechanisms, enabling them to revise and edit what they write after they have completed their essay (Wells, 1999b). According to Storch (2001), a composition task gives students the freedom to focus on what they think is important for them, rather than what their teacher wants them to focus on while writing. Some previous research studies on collaborative writing have used a composition task (e.g., Bikowski & Vithanage, 2016; Donato, 1988; Elola & Oskoz, 2010; Shehadeh, 2011; Storch, 2001, 2002). Therefore, the composition tasks designed for this study were based on the students' textbook. Table 3.4 includes the essay topics that students in both conditions had to write, from week 4 to week 12.

**Table 3.4** Essay types and topics from week 4 to week 12

<b>Weeks</b>	<b>Topics</b>
<b>Week 4, 5 and 6</b>	Some people prefer living in a house while others prefer living in an apartment. Compare the two opinions by giving examples and evidence to support your answer.
<b>Week 7, 8 and 9</b>	Some people think that online learning is better than classroom learning. To what extent do you agree or disagree? Give reasons and examples to support your answer.
<b>Week 11 and 12</b>	Emotional stress is not a new phenomenon. However, people seem to be more stressed than ever. Write about the causes and effects of stress in society today.

### 3.6.2 Instruments

As described in section 3.3, the mixed-methods approach, which includes the quantitative and qualitative methods of data collection, was used. This represented quantitative (pre- and post-

test written tasks and the frequency counts, the number of times the students engaged in the collaboration process) and qualitative methods (some extracts of students' discussions and learners' interviews). These instruments are described below.

### **3.6.2.1 The pre- and post-tests (written essays)**

To explore the improvement of learners' outcomes, data were collected from the pre- and post-tests. Individual students' tests are one of the appropriate methods of collecting data (Alnaser, 2013; Gall et al., 2007). As mentioned previously; to limit the probability of the students learning from pre-test to post-test, two parallel versions of a composition essay were designed to be used in pre- and post-tests (see appendix A). It is worthwhile to mention that these two parallel versions had been piloted before being implemented in this study to make sure they matched and elicited similar language in terms of grammar and vocabulary (see section 3.9.2). Moreover, as mentioned in section 3.5, these two versions were rotated to ensure that the test- and task-order did not influence the results (see Table 3.3). The subjects' progress was measured using Paulus's rubric (Paulus, 1999), based on their improvement in six categories: organisation, development, cohesion, structure, vocabulary and mechanics. The reasons for selecting Paulus's rubric are described below.

### **Essay-scoring rubric**

Many scales and rubrics can be used to rate students' written essays (IELTS, TOEFL, FL Composition Profile, etc.). Paulus's scale rubric has been used in many previous studies (e.g., Albeshir, 2011; Alnaser, 2013; Grami, 2010; Lundstrom & Baker, 2009). It is based on a scale of 1 (which represents the lowest mark) to 10 (which represents the strongest score), for 6 categories (see appendix H).

The following reasons make Paulus's scale appropriate:

1. The use of the rubric was investigated by some studies (e.g., Albeshar, 2012; Alnaser, 2013; Lundstrom & Baker, 2009). They found that the categories make it easier for the assessors to evaluate the students' essays.
2. Most other scales go from 1 to 6 (e.g., TOEFL, either CBT or iBT). However, Paulus's rubric allows the assessors to allocate students' marks on a scale of 1 to 10, which gives a fairly delineated measurement.
3. It is an appropriate scale to rate both the global and the local features of writing. According to Lundstrom and Baker, who used it in their (2009) study, this rubric "allowed for an analytical assessment of both the global and local aspects of writing, in addition to providing a holistic, overall final assessment score" (p. 34).

Baker and Lundstrom (2009) defined the six categories of Paulus's rubric (1999) as follows:

**Organisation** means ideas should be relevant to each other and the essay topic sentence should be clear enough for the reader to understand. The essay should consist of an introduction, the main body of the essay, and a conclusion.

**Development** means developing the essay by supplying evidence such as examples, experiences, or scientific information.

**Cohesion** means using discourse markers and connecting ideas clearly.

**Structure** refers to grammatical issues such as writing correct verbs and using appropriate tenses.

**Vocabulary** refers to using appropriate words effectively.

**Mechanics** means paying attention to capitalisation, spelling, and punctuation.

For the purposes of this study, ESL teachers with experience of marking essays evaluated the pre- and post-tests of the individual students in both groups based on the six categories of Paulus's rubric (1999). The mean score of students' marks was taken. If there was a lack of correlation between the first and second judges, a third assessor was assigned to make the final assessment (see section 3.10 on reliability).



### **3.6.2.2 Tracking the students' collaboration process**

Investigating the nature of learners' collaboration is very important in justifying the level of improvement in learners' outcomes. Therefore, to explore to what extent learners collaborated in the experimental and the control groups, data were collected from GD archives (the comments page and the revision history page).

According to Ware and Rivas (2012), tracking students' online interactions is an appropriate way to collect data. In the current study, the students' comments and the changes they made to their written essays were saved on the GD platform, so the researcher was easily able to access the electronic archives at any time, which is similar to what was reported in the previous research studies (e.g., Abrams, 2016; Arnold et al., 2009; Kessler et al., 2012; Kost, 2011; Lawrence & Lee, 2017; Alkhateeb, 2020; Kitjaroonchai & Suppasetseree, 2021). The purpose behind tracking learners' collaboration was to crosscheck the validity of data collected from pre- and post-tests. As discussed previously (in section 3.3), to claim that collaborative writing using GD impacts learners' writing abilities by only assessing learners' outcomes in pre- and post-tests could affect the validity of the study. Therefore, all learners' collaborative processes were analysed to provide a complete understanding of the GMCW with teacher intervention.

### **3.6.2.3 Post-activity semi-structured interview**

In addition to tracking the students' interactions when they were writing a joint text, one student from each group in both conditions (experimental and control) was interviewed at the end of the study to collect additional information about their experiences of using GMCW. The researcher found out the students' views on online writing and interacting using GD, so the interview shed light on aspects that cannot be observed using the other instruments (Ware & Rivas, 2012; Wellington & Szczerbinski, 2007). Semi-structured interviews were used to support the analysis of the students' interactional process and to provide supporting or

supplementary information about their online interactions in the form of collaborative writing.

According to Bryman (2004) and Denscombe (2003), interviews can be structured, semi-structured or unstructured. The semi-structured interview is a tool that enables people to talk freely and flexibly. In this study, a semi-structured interview was used because the researcher wanted her respondents to speak freely without any limitations. This type of interview can be positioned between the structured interview and the unstructured interview (Berg, 2007; Cohen et al., 2011; Kvale, 2007). The positive aspects of the semi-structured interview are: (1) it enables the respondents to give open-ended answers to the questions, and (2) alternative questions can be used if any of the main questions are not understood clearly (Bernard & Ryan, 2010; Cohen et al., 2011; Robson, 1993).

The primary goal of the interviews was to collect information about students' experiences with online writing and interaction via GD in order to better understand the underlying factors that influence students' interactional processes. Topics for the student interview were derived from previous research (Li, 2014; Alghasab, 2015; Woo et al., 2013). All these topics are about students' perceptions and experiences with GD collaboration. The use of the technology (GD), interacting in small groups via GD, collaboration during the stages of the writing process using GD, and interacting with the teacher via GD were discussed. (See appendix G for the student semi-structured interview schedule).

### **3.7 Description of the procedures**

The study was conducted during the first academic term (from October 2021 to January 2022) and was completed in 14 weeks. Table 3.5 contains a summary of the procedures that were adopted during the whole period of the study.

**Table 3.5** Study procedures

<b>Weeks</b>	<b>Activity</b>
<b>Week 1</b>	Distributing consent forms to all students. Assigning one class to represent GD-mediated collaborative writing as an experimental condition with a teacher intervention and the other class to represent GD-mediated collaborative writing without a teacher intervention as a control condition. Participants in the two classes have written an essay as a pre-test.
<b>Week 2</b> <b>Teacher technical and interventional training</b>	The researcher trained the study teacher technically on how to use GD and pedagogically on how to intervene collaboratively with students.
<b>Week 3</b> <b>Students' technical training</b>	The teacher trained the students how to: <ul style="list-style-type: none"> <li>• write an essay using the process writing approach that includes the stages of pre-writing, drafting, revising, and editing.</li> <li>• use GD technically such as creating a Gmail account, logging into an account, writing, posting, revising, editing, the page history.</li> </ul>
<b>Week 4, 5 &amp; 6</b> <b>First task</b>	The teacher trained the participants in the experimental and control conditions how to write a four-paragraph essay. They wrote collaboratively about the following topic: Some people prefer living in a house while others prefer living in an apartment. Compare the two opinions by giving examples and evidence to support your answer.
<b>Week 7, 8 &amp; 9</b> <b>Middle task</b>	The teacher trained the participants in the experimental and control groups how to write a four-paragraph essay. They wrote collaboratively about the following topic: Some people think that online learning is better than classroom learning. To what extent do you agree or disagree? Give reasons and examples to support your answer.
<b>Week 10</b>	Midterm exam
<b>Week 11 &amp; 12</b> <b>Final task</b>	The teacher trained the participants in the experimental and control groups how to write a four-paragraph essay. They wrote collaboratively about the following topic: Emotional stress is not a new phenomenon. However, people seem to be more stressed than ever. Write about the causes and effects of stress in society today.
<b>Week 13</b>	The participants in the two classes have written an essay as a post-test.
<b>Week 14</b>	The researcher conducted the interviews.

At the beginning of the study, the students in the two classes of level 3 were informed about the aim of the research and were asked to sign a consent form (appendix J). After that, one class was assigned to GMCW with a teacher intervention (experimental group) and the other class was assigned to GMCW without a teacher intervention (control group). Following the assignment and allocation of the groups to the different conditions, the students were asked to write a composition essay individually as the pre-test (appendix A). As mentioned previously, two parallel versions (A and B) of the composition essays were designed, and these two versions were switched around for each of the two tests using a counterbalanced strategy to

control any effects associated with the order or the equivalence of these tests (for more details see section 3.5).

After the students' pre-tests were completed and collected in week 1, week 2 was allocated to train the teacher technically on how to use GD and pedagogically on how to intervene collaboratively with the students. Each training session lasted one hour. The purpose of the technical training was to ensure the teacher was equipped with the basic skills that could help him carry out the tasks using GD such as, writing, editing, adding, inserting charts or links, and viewing the version history page (for more details see appendix B). To achieve this purpose the teacher was given the GD basic tutorial handout that showed the different steps for using GD (see appendix F). After that, the teacher practised these steps in front of the researcher. Then the researcher asked the teacher if he had any technical problems or queries related to GD.

After the teacher was trained technically, he engaged in a pedagogical training session on how to intervene with students in the experimental group when writing collaboratively in their small groups using GD. The aim of this session was to ensure that the teacher was able to promote students' collaboration by following some instructions (for more details see appendix C.) To achieve this aim, the researcher gave teacher an intervention handout in order to foster particular types of interventions, namely cognitive, social interventions and the teacher's posts (as shown in appendix E). To ensure the teacher's employment of collaborative behaviours, the researcher observed the teacher in the first task of the intervention.

Week 3 was dedicated to teaching the students in both groups the process approach to writing that includes the stages of pre-writing, drafting, revising and editing. All the participants in both conditions were given a training class to make sure they understood the lesson and to

give them the opportunity to ask the teacher about any unclear points. According to Kroll (2003) and Belinda (2006), the process approach to writing with its stages is considered an ideal approach for ESL learners to learn how to improve the accuracy and quality of produced texts. The focus in each of the stages was explained in the literature review (section 2.4.1) and can be summarised as follows:

1. Pre-writing stage: consisting of gathering lexicon items, collecting new ideas, brainstorming and making an essay outline.
2. Drafting: emphasising writing the first draft of the essay completely. As mentioned in the literature review (section 2.1.2), learners should be encouraged to confine themselves to writing, without thinking about their mistakes and without stopping until they have finished (Hedge, 2005; King & Chapman, 2003).
3. Revising and editing stages: including coherence and cohesion between sentences, changing unrelated words, adding new words or grammatical patterns, and focusing on linguistic accuracy (e.g., spelling and punctuation).

After teaching the students how to write an essay using the process-writing approach, the teacher trained the students to use GD. The teacher taught the students in each condition (experimental and control) the same technical training steps that were presented to him in the teacher's session, such as creating an account in Gmail, logging into an account, writing, posting, revising and editing the page history. To ensure that students were able to use GD effectively, they were given opportunities to practise a GD training activity for four hours under the teacher's supervision (see appendix D).

From week 4 to week 12, the students in each condition (experimental and control) were divided into small groups to work collaboratively on GD training tasks (see section 3.6.1.2). In line with Storch (2005, 2002), group formation was based on self-selection; that is, learners were given the option of choosing their own group members. The teacher's main role

was that of monitor, trainer and facilitator to help the students follow the best ways of writing their essays using GD. Therefore, he explained to the students working in small groups that they should interact in a collaborative writing activity to share their knowledge and give feedback to each other. In addition, some concepts of collaboration were introduced to the students, such as taking responsibility for co-ownership of the text and accepting comments from their classmates (Storch, 2013). According to their writing syllabus, students in each condition (experimental and control) participated in a three-hour writing lesson every week. Based on their textbook, every three weeks their teacher taught them how to write a specific type of composition essay by following the writing-process approach. At the end of every lesson, students in both conditions (experimental and control) were asked to co-construct in small groups a jointly written essay using GD. In the experimental condition, each small group completed their essays using GD with their teacher intervention, whereas the students in the control condition completed their written drafts in small groups without any assistance from the teacher. It should be noted here that all the students could complete their drafts outside of class if they ran out of time, and submit it to get feedback from their teacher. Table 3.6 is a summary of similarities and differences between the experimental and control groups.

**Table 3.6** Comparison between the experimental and control groups

<div>Group</div> <div>Type of activity</div>	Experimental Condition	Control Condition
<b>Collaborative writing</b>	Students in both conditions <ul style="list-style-type: none"> <li>• were taught how to write an essay using the process writing approach.</li> <li>• worked in small groups.</li> <li>• were encouraged to produce a shared essay by giving an explicit instruction on how to write collaboratively.</li> <li>• The teacher's role was to answer students' questions.</li> </ul>	
<b>Using GD</b>	Students in both conditions were <ul style="list-style-type: none"> <li>• trained technically how to use GD.</li> <li>• familiarised with the main affordances of GD (see appendix F).</li> </ul> The teacher gave a presentation on the basic skills needed relating to GD, such as creating an account in Gmail, logging into an account, writing, posting, revising, editing, the page history, and an example of GD. After the presentation, the students connected online and started practising using the steps and features of GD (see Appendix D).	
<b>Teacher intervention</b>	The teacher intervened when students wrote collaborative text using GD. The teacher's role was to promote their collaboration by using the following strategies: <ul style="list-style-type: none"> <li>• stimulating answers from students and promoting students' collaboration such as raising some questions.</li> <li>• creating a nonthreatening GD environment and enhancing students' accuracy and fluency such as praising or encouraging their contributions.</li> <li>• avoiding posting too much in order to give students the opportunity to interact with one another. (see appendix C)</li> </ul>	The teacher did not intervene when students wrote collaboratively using GD.

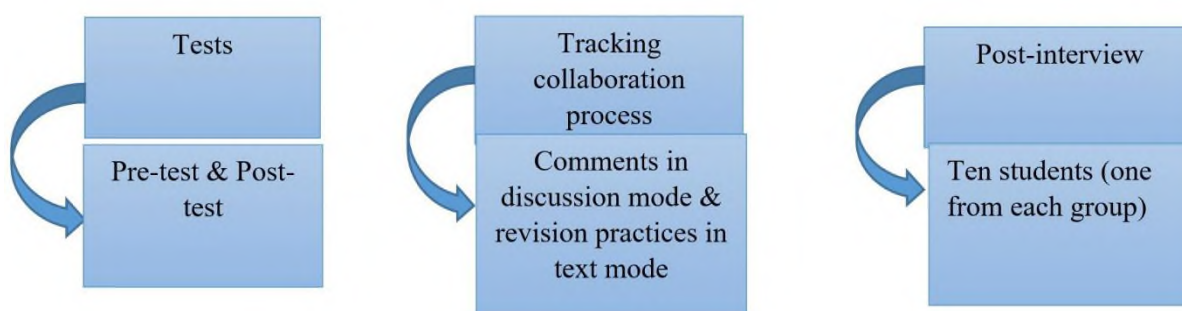
At the end of the study, the post-test was administrated in week 13. As in the pre-test, the counterbalancing strategy was used to neutralise any test effects related to tests, so the two versions (A and B) were rotated over the post-test. After the students submitted their post-test written essays, each group in both the experimental (teacher intervention) and control (no teacher intervention) conditions selected one learner on behalf of the group to be interviewed for 25 minutes in order to obtain information about their experiences of online writing and interaction via group discussion. As mentioned in section 3.6.2.3, post-activity semi-structured interviews were conducted to provide supplementary information about the

students' online interactions. All the interviews were conducted in English; however, the interviewees were given the option to respond in Arabic or English.

### 3.8 Data analysis

As mentioned in section 3.3, a mixed-method approach to data collection was adopted, including pre- and post-test written essays, tracking the students' interactional process, and conducting semi-structured interviews. Since the aim of this study is to investigate the impact of GMCW with teacher intervention on improving learners' writing outcomes in subsequent individual performance, the researcher expected that students who collaborated with teacher intervention would engage in collaborative patterns of interactions and improve their writing outcomes more than those who collaborated without teacher intervention.

The data analysis set includes the pre-test, post-test, tracking the students' interactional process, and post-interview. The researcher collected the pre- and post-tests for all students individually and tracked the students' comments in the discussion mode and revision practices in the text mode for all groups. Moreover, the post-interview data was collected from one student from each group. The data obtained were quantitative for pre- and post-tests, quantitative and qualitative for tracking the students' collaboration process, and qualitative for the post-interview. Figure 3.3 summarises the data set of the study.



**Figure 3.3** Analysis diagram



### 3.8.1 Analysis process

Firstly, the pre-and post-test scores of the experimental group (GMCW with a teacher intervention) and the control group (GMCW without a teacher intervention) were collected and rated by two ESL teachers. The researcher entered the students' scores for each category manually into the Statistical Package for the Social Sciences (SPSS).

The second step was to choose one task for all the students in both the experimental and control conditions from the GD archives in order to take a snapshot of the students' collaboration process. This step involved repeatedly reading the learners' posted comments in the GD comment history and manually coding the collaborative behaviours for each individual learner according to the three types of comments provided in the study's frameworks (planning, cognitive and social; see section 3.8.1.2.1). It was possible that a GD post could be eligible for more than one code, so there could have been two or more codes assigned to one comment. Additionally, this step involved repeatedly reading learners' revision behaviours in GD version history and manually coding the learners' revision collaborative behaviour in text mode (i.e., adding, deleting, extending and correcting formal mistakes). Each revision behaviour performed by each group member in the small group was distinguished in terms of 'self' and 'other'. The researcher saved each group's comments and revision behaviours in Word documents.

After coding the learners' posted comments in discussion mode and their revision behaviour in text mode in both the experimental and control conditions, the overall level of collaboration was evaluated across the two conditions and the patterns of learners' interaction in each small group were identified based on Storch's (2002) model of dyadic interaction (see details in section 2.5.1). These patterns were distinguished in terms of Storch's (2002) criteria: *equality* and *mutuality*. Therefore, this stage involved two phases: (1) quantifying the

number of times each student participated in the collaboration process to provide a descriptive statistical analysis for each small group in order to measure the level of equality in students' contributions to the task, and (2) qualitative analysis of students' extracts to measure learners' mutual interaction and contribution. Identifying learners' patterns of interaction aims to determine how much each small group collaborates under experimental and control conditions. It should be noted that the researcher in this study expected that, because of teacher intervention, the learners in the experimental condition would engage in collaborative behaviour more than those learners in the control condition. The teacher's intervention in the learners' collaboration process was therefore investigated to ensure fidelity to condition, that is to make sure that the teacher intervention promotes rather than hinders learners' collaboration (see appendix K).

Based on SCT, this study suggests that the extent to which learners collaborate has implications for individual performance. Therefore, after analysing the students' scores in pre- and post-tests and their collaboration process, the researcher investigated whether the differences in learners' patterns of interaction result in different outcomes. This was done by providing Descriptive Statistics for mean scores of each pattern identified in the study. Finally, the learners' interview data were transcribed and recorded in a Word document in order to provide a qualitative thematic analysis for the learners' perception of GD-mediated collaborative writing in both the experimental and control groups.

#### **3.8.1.1 Analysis of pre- and post-tests**

The pre-and post-test scores of the experimental condition (GMCW with a teacher intervention) and the control condition (GMCW without a teacher intervention) were collected and rated by two ESL teachers. The raters used Paulus's rubric to assess the students' essays in terms of the six categories (organisation, development, cohesion, structure, vocabulary and mechanics; see section 3.6.2.1 for more details). The researcher

entered the students' scores manually into the SPSS. According to Field (2009), in the event that the data have a normal distribution, parametric tests will be carried out; therefore, students' scores in both the pre-and post-test essays are analysed using a two-by-two mixed analysis of variance (ANOVA) to determine whether there is a significant main effect of scores (pre- and post-test) on the improvement of the students' writing outcomes within each condition (experimental and control subject) and to determine whether there is a significant interaction effect between the type of group (experimental and control) and the type of test (pre- and post-test).

### **3.8.1.2 Analysis of students' collaboration process**

To analyse the students' collaboration process, it is essential to shed light on the framework that is used for coding their collaborative behaviour and the procedures used to analyse the interactional process analysis, as presented below.

#### ***3.8.1.2.1 The collaboration process framework***

The choice of a framework for analysing the students' writing and interaction process was based on the definition of the students' collaboration, as given in Chapter 2. Therefore, in this study, collaboration refers to the students co-constructing the online text via GD. This process required the students to contribute equally and discuss mutually in an effort to draw on their collective cognitive knowledge to find the most appropriate way to express their ideas. Co-constructing the text also required students to contribute equally to the written texts and engage mutually with each other's written ideas by editing and expanding each other's ideas rather than only adding and editing their own.

Regarding measuring the students' collaboration, few quantitative studies have been conducted to measure the number of contributions made by each individual student (Yim & Warschauer, 2017). Some researchers of online collaborative writing (e.g., Arnold et al.,

2012; Elola & Oskoz, 2010) have used manual coding to measure the number of contributions made by each student and their revision behaviour. For studies that include large samples, there are techniques that are useful for quantifying and clarifying the collaboration process; these are called text-mining tools (e.g., Visualising the Collaborative Writing Patterns, Studying Collaborative Authoring Practices in Educational Settings [SCAPES], Stimulated Recall of the Collaborative Writing Processes) (Yim & Warschauer, 2017). SCAPES is an example of a text-mining approach that is close to the purposes of the current study. SCAPES is only used when it is necessary to analyse thousands of documents. Therefore, it was not appropriate for the current study because only a small number of students were involved (see section 3.4 for information about the study sample).

To explore how the students collaborated with each other while writing the joint essay using online GD, it was important to focus on their interaction while they deliberated on the task in the discussion mode, and on their writing and revision behaviour in the text mode. Therefore, data were collected from the GD archives (the comments page and the version history page). Coding and quantifying the number of comments in discussion mode and the students' revision behaviours in text mode were based on the taxonomies used in previous studies (e.g., Alghasab, 2015; Arnold et al., 2009; Elola & Oskoz, 2010; Li, 2013, 2014; Li & Kim, 2016) with some necessary modifications, and then they were counted manually. For the students' interaction in the discussion mode, Elola and Oskoz's (2010) taxonomy includes types of interactions, such as providing feedback, dividing the work and showing dis/agreement. Li (2013, 2014) and Li and Kim (2016) provide a taxonomy of language functions that include clear interactional behaviours, showing how learners collaborate. These involve showing dis/agreement, showing acknowledgement, elaborating, greeting, questioning, requesting and suggesting. Alghasab (2015) provides a detailed framework that contains collaborative and

non-collaborative interactional behaviour under three levels of interaction: organisational, socio-cognitive and socio-affective levels.

For the students' writing and revision behaviour in text mode, Arnold et al.'s (2009) taxonomy includes three types of change: formal changes (e.g., spelling, punctuation, verbs, word order, lexical revisions and translation), meaning-preserving changes (e.g., additions, deletions, substitutions and reordering) and meaning-developing changes (e.g., significant content additions, significant content deletions and factual correction). According to Yim and Warschauer (2017, p. 153): "These variables can be utilised to examine the characteristics of writers' collaborative behaviours and how their writing and revision may relate to their writing outcomes." Li (2014) provides a taxonomy of writing functions representing a list of revision behaviours, such as local revisions and global revisions and self-writing functions and other-writing functions.

Based on the studies mentioned above, in the present study, the researcher decided to construct two taxonomies of collaborative behaviour based on the two interactional modes of GD (online comments in the discussion mode and revision behaviours in the text mode). In the taxonomy of online comments in the discussion mode, the researcher selected a combination of collaborative behaviours identified by previous researchers (Elola & Oskoz, 2010; Li, 2013, 2014; Li & Kim, 2016). Moreover, it was appropriate to use Alghasab's (2015) classifications of the level of interaction, that is, planning comments, which refers to the students' interactional behaviours in the planning stage of writing. Cognitive comments refer to how students negotiate the task with each other and the extent to which they draw on their collective cognitive knowledge. Social comments refer to interpersonal interactions that show how the students establish their relationship. For the taxonomy of revision behaviour in the text mode, the revision behaviours that were presented in Arnold et al. (2009) and Li (2014) were chosen for this study. Table 3.7 presents the taxonomy of online comments in

the discussion mode. Table 3.8 presents a taxonomy of the revision behaviour in the text mode and Table 3.9 displays the categories classifying the students' revision behaviours to evaluate their mutual contributions by analysing their self- and other-revision behaviour.

**Table 3.7** Taxonomy of the students' online comments in the discussion mode

Type of comments	Type of collaboration	Definitions	Examples
Planning comments	Organising the task Initiating the writing activity	Discussing how to organise the task	We should start writing about this.
Cognitive comments	Showing agreement or disagreement	Agreeing or disagreeing with others' opinions	I agree with you. I don't agree with you.
	Providing and seeking peer feedback	Giving and seeking language-related feedback on Writing	No ... with negation you have to use verb in a simple form. Please could you give me the meaning of this word?
	Elaborating	Extending one's ideas or others' ideas	There are some more points we can come up with.
	Eliciting	Eliciting and extracting opinions and comments from one's partner	What do you think about this point?
	Questions	Asking questions about information that one is not clear about	What is the difference between a global language and an important language?
	Justifying	When one student defines his/her own standpoint for his/her partner	We can say English is a global language because it is used in most of the countries around the world.
	Requesting	Asking direct requests	Could you add something to the paragraph?
	Clarifying	Asking for clarification	What do you mean?
	Suggesting	Offering suggestions and recommendations about the writing content and structure	Should we talk about benefits of learning the English language?
Social comments	Greeting, acknowledging, and encouraging expressions of emotions: thanking, praising, and apologising.	Group members give social-related comments to create a participatory and friendly environment, such as greeting, praising, and encouraging	Hi friend. Thanks for your help. It is a great idea.

**Table 3.8** Taxonomy of the students' revision behaviours in the text mode

Writing change functions	Definitions	Examples
Deleting	Removing text or existing information	people who speak English can travel all over the world without facing any difficulties. (The sentence is deleted.)
Adding	Contributing to the text by adding new content	English is an important language for many reasons. (This sentence is added.)
Extending	Adding information to the existing content	English is a global language because it is used more in business [...] The increase of English language use in fields such as business, university studies, research, and sciences is one of the main reasons for considering English as a global language. (This sentence is rephrased.)
Correcting formal errors	Correcting grammar, mechanics, and spelling mistakes	Learning English is important; however, learning another language should not neglectable [...] Learning English is important; however, learning other languages should not be neglected. (The grammar mistake is corrected.)

**Table 3.9** Classifying the students' revision behaviours in the text mode

Two main categories	Definitions
<b>Self</b>	Revisions that made by student to his own written texts
<b>Other</b>	Revisions that made by student to other's written texts

### ***3.8.1.2.2 The procedures of the collaboration process analysis***

After presenting the study's frameworks (see section 3.8.1.2.1), one task for all the students in both the experimental and control groups was chosen from the GD archives and analysed quantitatively and qualitatively. The middle task (weeks 7, 8 and 9) was selected for analysing the students' collaboration process. The reason for not selecting the tasks at the beginning of the study was that students needed to be familiarised with the tasks to ensure that they were able to practise all the stages of the writing process (pre-writing, etc.) and could complete all the GD steps. According to Swain (1998) and Storch (2001), the students' interactions during the tasks in the first weeks of the study should not be analysed because they still need to familiarise themselves with the tasks, techniques and strategies. Moreover, collaborative writing researchers have reported that students' contributions to the online task

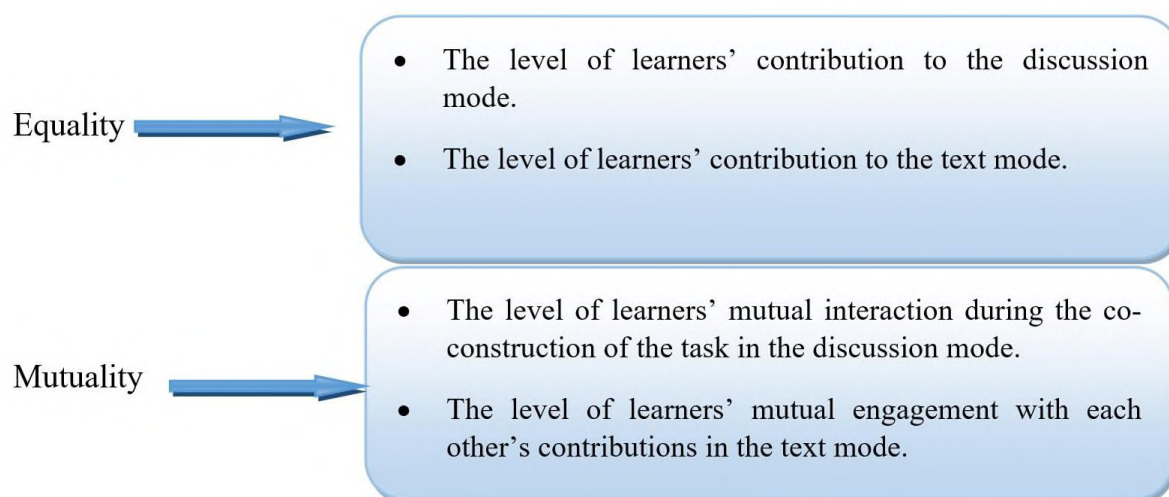
can increase in the second phase of the study because, over time, they feel more comfortable and are able to make additions to their work and elaborate on what they have written (Kessler & Bikowski, 2010; Mak & Coniam, 2008). The reason for not selecting the final task was that its duration was shorter than the other tasks (first and second) because the time of completing this task coincided with the students' midterm exams. Moreover, since the students in weeks 11 and 12 were required to submit assignments for other courses, their contribution to the final task could have been affected due to their study's requirement.

After selecting the task, the researcher invited the teacher who is interested in computer-assisted language learning (CALL) to quantify learners' collaborative behaviour from the GD archives (the comments page and the version history page). The teacher was trained on how to code and classify the students' collaboration process based on the two categories. The first category is the taxonomy of the students' comments in the discussion mode (i.e., providing and seeking peer feedback, showing dis/agreement, giving suggestions on another person's written ideas, requesting clarification, and expressing emotions: thanking, praising, apologising and greeting). The second category is the number of revision practices in the text mode (i.e., adding, deleting, extending and correcting formal mistakes).

The procedures of analysing learners' collaboration process involved two stages. The first stage was done to assess the overall level of collaboration across the two conditions through quantitative analyses of learners' comments and revision behaviour for each small group in both experimental and control conditions. The second stage aimed to identify learners' patterns of interaction based on Storch's (2002) model of dyadic interaction (see details in section 2.5.1). The patterns of students' interaction were identified through examining how each group co-constructed the writing task in terms of Storch's (2002) criteria: equality and mutuality (Li & Zhu, 2011; Alkhateeb, 2020; Kitjaroonchai & Suppasetserree, 2021; Elabdali & Arnold, 2020; Abrams, 2016). In this study, equality means the degree of learners'



contribution to the tow modes of interaction in GD. Mutuality means the degree of learners' mutual interaction in discussion mode and the degree of their engagement with each other's contributions in text mode, as shown in Figure 3.4.



**Figure 3.4** Analysis of the learners' collaboration process – equality and mutuality

For the purpose of presenting the pattern of interaction in the data analysis chapter, it was determined to present the level of equality in each pattern by displaying frequency counts and the proportion of each learner's contributions in both modes of interaction, along with their names and roles. While the level of mutuality was determined by qualitative analysis of students' extracts, as shown in Extract 1 below, the extracts include learners' interactions, whether comments or writing, the name and role of the individual who performed the action, as well as the type of action performed (e.g., comments or editing). Dark grey highlights were used in the writing act to distinguish it from the commenting act. A cross mark has been used to indicate edited text, and an underline has been used to indicate expanded text. The use of an arrow before the person's name indicates who responded to whom.

### Extract 1: Group 3

Google Doc interaction	Types of comments/edits
Motoua (collaborative learner) wrote Some Stress early in life is conducive to later emotional growth, but stress can also threaten a person's healthy life.	Adding new ideas
Motoua (collaborative learner) said Guys what do you think of thesis statement?	Eliciting
→ Fozan (collaborative learner) said it is good, but I think we need to mention the causes that led to emotional stress, so we can discuss them in body 1 and 2	Encouraging + Showing disagreement + justifying
→ Motoua (collaborative learner) said ok I will add some causes	Showing agreement
→ Fozan (collaborative learner) said we need to pick 2 general causes, that way it will be easier to talk about them in the body. how about (money, increased responsibilities) for causes what do u think, also we need Ali and Omar opinion before we write	Suggesting + Eliciting
→ Motoua (collaborative learner) said I think it is good cause, yes, we need their opinion?	Showing agreement
→ Ali (collaborative learner) said Yes, I agree both are good we can use them	Showing agreement
Fozan (collaborative learner) wrote Money and increased responsibilities are the main causes that lead to emotional stress which may impact our physical and mental state.	Adding new ideas
→ Motoua (collaborative learner) wrote <u>Moreover, put your life at risk to emotional stress. Researchers have found that the sudden clumping of blood platelets triggers attacks caused by fear or anger.</u>	Extending another member's idea.
→ Ali (collaborative learner) wrote <del>Moreover, put your life at risk to emotional stress. Researchers have found that the sudden clumping of blood platelets triggers attacks caused by fear or anger.</del> <u>Moreover, the researchers have found that stress mainly comes from academic tests, interpersonal relations, relationship problems, life changes, and career explorations.</u>	Deleting another member's text + Extending another member's idea.

### 3.8.1.3 Analysis of the post-interview

The purpose of an interview is to explain the results obtained from analysing students' collaboration process and to gain a deeper understanding of the factors that influence students' levels of collaboration. eleven students were chosen for the post-interview, one

from each small group in both the experimental (with teacher intervention) and control (without teacher intervention) groups. That is, the experience and perception of each small group were examined using a thematic analysis based on the responses of the speaker selected by the learners on behalf of the group. Thematic analysis is one of several approaches for analysing participant talk about their experiences (Mahrer, 1988; Spradley, 1979; Taylor & Bogdan, 1984). According to Aronson (1995), thematic analysis focuses on obvious themes that can be identified through the conversations that occur during the interview. As a result, after transcribing the learners' interview responses, the researcher identified two themes based on learners' responses which are also relevant to the literature and the study's objectives. According to Aronson (1995), the relevant literature and research objective serve as the foundation for selecting themes in a thematic analysis. These themes are 1) GMCW activities foster L2 learning, and 2) Teacher intervention is essential in collaborative activities.

### **3.9 The pilot study**

It was necessary to conduct a pilot study prior to the main study in order to modify any instruments or procedures associated with data collection. In the present study, the researcher aimed to pilot the teacher's and students' training sessions, the instruments (including tests and interviews), and to track the learners' collaboration process. The latter included the collaboration process framework and approach to data analysis. According to Seliger and Shomany (1989), the research instruments and training sessions should be tested to ensure they are as qualified as possible before applying them to the actual study sample. The purpose of piloting both training sessions and instruments entailed the following:

- Making sure that the lesson plans, handouts, and scheduled time were sufficient to train the teacher and students.

- Checking whether the two parallel versions used in the pre- and post-tests matched and elicited similar language in terms of grammar and vocabulary.
- Evaluating the applicability of the framework used to track the students' interactional process in the current study.
- Assessing the effectiveness of the approach to analyse collaboration-process data in answering the second research question.
- Checking the clarity and suitability of the interview questions.

The pilot study was conducted in June 2021 with four students from Al Qassim University in Saudi Arabia over a period of three weeks. The following sections provide a detailed description of the procedures employed in the pilot study.

### **3.9.1 Piloting the sufficiency of the lesson plans, handouts and scheduled time to train the teacher and students**

It was important to make sure that the lesson plans, handouts and scheduled time were sufficient to train both the teacher and the students as shown in the following:

#### **3.9.1.1 Piloting the teacher's training sessions**

As stated in section 3.7, the teacher in this study was involved in two different types of training sessions, namely technical and intervention training. The researcher piloted these two sessions as follows.

##### ***3.9.1.1.1 Piloting the teacher's GD training session***

Training the teacher on how to use GD would ensure he had the basic skills to carry out the tasks effectively. Therefore, it was important to pilot the teacher's GD training session before conducting the fieldwork to assess the lesson plan that was provided in this study (see appendix B). The duration of the session was an hour. At the beginning of the session, the researcher gave the teacher the GD training handout that showed the steps for using GD, such

as posting comments, making changes, addition and deletion (see basic tutorial handout in appendix F). After that, the teacher practised these steps in front of the researcher, then the researcher asked the teacher if he had any technical problems or queries related to GD. The researcher noticed that both the time and the training session were sufficient for the teacher to be familiar with the technical steps of using GD.

#### ***3.9.1.1.2 Piloting the teacher's intervention training***

The key purpose of the teacher's intervention training in the study was to ensure that the teacher was able to intervene collaboratively and avoid any non-collaborative behaviours. The aim of piloting this session was to evaluate the teacher's intervention training lesson plan (see appendix C) to make sure that this lesson plan and handout were sufficient for training the teacher on how to promote students' collaborations. The session lasted for one hour. At the beginning, the researcher provided the teacher with the teacher's intervention handout in order to adopt particular types of interventions, namely cognitive, social interventions and the teacher's posts (as shown in appendix E). During the piloting, the researcher was making observations to ensure the teacher's employment of collaborative behaviours. Even though the teacher was trained to keep his posts to a minimum in order to give the students the opportunity to interact with others, his interventions were useful in encouraging them to collaborate with one another in their small groups. The researcher noticed that both the teacher's intervention handout (as shown in appendix E), and the teacher's intervention training lesson plan (as demonstrated in appendix C) were sufficient to demonstrate to him how to intervene with students to promote their collaboration.

#### **3.9.1.2 Piloting the students' GD training session**

To ensure that the students were familiar with the fundamental skills required to understand how to use GD, it was necessary to train them technically on how to use GD; therefore, the piloting objective was to evaluate whether the technical lesson plan provided was sufficient

(see appendix D). To achieve this, the researcher provided a training handout (see appendix F) on how to use the GD and asked the teacher to train the students how to work using GD (e.g., logging onto GD, sending an invitation to the teacher to join them during the training session in order to guide, assist and answer their questions). The session lasted for two hours.

After training the students in the pilot study, the researcher noticed that the time was taken up even for the small numbers of the participants. However, the main study included more participants (i.e., 40 students). Therefore, the training duration was made longer (i.e., four hours) to make sure that all students understood how to use GD and thus collaborate more effectively.

### **3.9.2 Piloting the essay topics for the pre- and post-tests**

The first research question of the study aimed to find out the individual writing outcomes of students at pre- and post-tests. The researcher selected two parallel versions of composition essays (see appendix A) because selecting only one version could possibly lead students to duplicate information from one test to another. For that reason, it was necessary to pilot them in order to ensure that they were matched and elicited similar language in terms of grammar and vocabulary.

In the pilot study, the four students taking part were asked to write a composition essay for both pre- and post-test. Based on the students' textbook (*Effective Academic Writing-III*, Jason, Davis & Rhonda Liss, OUP 2006; Unit 4: Argumentative Essays), writing would include signal words used in argumentative essay assignments (e.g., argue, opine, defend, convince, claim, believe). Alongside vocabulary, language and grammar focus would be included when writing argumentative essays, namely connectors to show additions (e.g., furthermore, in addition, moreover) and connectors to show contrasts (e.g., nevertheless, however, in contrast). In addition, the essay writers would clearly mention their opinion at the

end of the written text. After the four participants completed the two parallel versions of argumentative composition essays, their written texts were coded for data analysis. The frequency of using the signal words and connectors (additions and contrasts) were counted and analysed. Table 3.10 showed the frequencies and percentages of vocabulary and grammar elicited by the two versions of the pre-test and post-test for the four participants.

**Table 3.10** Frequencies and percentages of vocabulary and grammar elicited by the two versions of the argumentative essays for pre-test and post-test

Factors	Task 1						Task 2					
	S	L	R	A	Total	Percentage*	S	L	R	A	Total	Percentage
Signal words used in argumentative essays (e.g., argue, opinion, defend, convince, claim, believe)	2	2	2	2	8	53.3	2	2	2	1	7	46.6
Connectors to show addition (e.g., furthermore, in addition, moreover)	1	3	1	1	6	42.8	3	1	1	3	8	57
Connectors to show contrast (e.g., nevertheless, however)	1	1	2	2	6	50	0	2	3	1	6	50
Mentioning the writer's opinion	1	1	1	1	4	50	1	1	1	1	4	50

\* Percentage=the frequency of vocabulary and grammar used in task 1 divided by the sum of frequencies of vocabulary and grammar used in task1+task 2 multiplied by 100.

It was obvious from the above table that the two different writing composition tasks selected for pre- and post-test appeared to be matched, and elicited similar language in terms of grammar and vocabulary.

### 3.9.3 Piloting the tracking learners' collaboration process

As mentioned in section 2.7.2, the second research question aimed to examine the students' collaborative behaviour by tracking their interactional process while co-constructing the text using GD. The purpose of tracking learners' collaboration process was to investigate to what

extent learners would collaborate with and without teacher intervention. The aim of piloting the tracking of learners' collaboration process was to:

- evaluate the applicability of the framework used to track the students' interactional process in the current study, and
- assess the effectiveness of the approach to analyse collaboration-process data in answering the second research question.

Once the learners' and the teacher's training sessions were piloted, the teacher was asked to present an online lecture via Zoom to teach learners how to write an argumentative essay using the process approach. At the end of the lecture, the teacher explained to his students how to write an essay collaboratively. After that, the four learners participating in the pilot study joined GD in one small group to co-construct an argumentative essay with their teacher's intervention. The process of co-constructing the online joint essay lasted for five days. When the learners finished, the researcher referred to the GD archive to track learners' collaboration process in order to check the applicability of the framework used in this study, and to assess the effectiveness of the approach analysing the learners' collaboration process.

### **3.9.3.1 Piloting the applicability of students' interactional framework**

The framework for analysing the students' collaboration process was divided into two taxonomies: online comments in discussion mode (i.e., providing and seeking peer feedback, showing dis/agreement, giving suggestions on another person's written ideas, requesting clarification and expressing emotions: thanking, praising, apologising and greeting) and revision behaviours in text mode (i.e., adding, deleting, extending and correcting formal mistakes).

After coding the students' comments in the discussion mode and revision behaviours in the text mode, the researcher found that the two taxonomies were adequate for quantifying and



classifying students' collaborative behaviours. However, the researcher observed one collaborative behaviour in the students' interaction emerging from piloting data that was not added to the taxonomy of the students' online comments in the discussion mode, namely clarifying. Therefore, this category was added to the framework.

### **3.9.3.2 Piloting the approach to analysing learners' collaboration process**

Since the second research question aims to investigate the extent to which students collaborate in different groups (with teacher intervention and without teacher intervention), the learners' collaboration process should be analysed through examining how the small group would co-construct the writing task in terms of Storch's (2002) criteria: 'equality' and 'mutuality'. Equality means the degree of learners' contribution to the online joint text. Mutuality means the degree of learners' engagement with each other's contribution. Therefore, there was a need to pilot the suitability of the approach to analysing collaboration process data in answering the second research question before adopting it in the main study. Thus, when learners in the pilot study finished constructing the joint written text using GD, the researcher quantitatively and qualitatively analysed their posted comments in the discussion mode and their revision behaviour in the text mode, as shown in the version and comment history, in order to identify the degree of equality and mutuality (see appendix I for more details).

After analysing the learners' collaboration process the researcher noticed that the use of combined methods (quantitative and qualitative) in analysing the data was effective. However, adopting the five main themes (as shown below) was not effective in identifying and explaining learners' pattern of interaction.

- The students' level of contribution to the task in both modes of collaboration.
- The students' level of sharing the decision-making and the authority over the task.

- The level of students' mutual cognitive engagement.
- The level of students' mutual social engagement.
- The students' level of engagement with each other's contributions to the written text.

Therefore, the researcher decided to provide an overall view of learners' levels of collaboration by quantitatively analysing students' contributions in all small groups across the two conditions. While the level of equality was determined by the distribution of these contributions among learners in each small group, the level of mutuality was determined by analysing how much learners engaged with each other's contributions qualitatively.

### **3.9.4 Piloting the post-activity semi-structured interview**

As stated in section 3.3, the main purpose of the interviews is to elicit information regarding the students' experience and perceptions of online writing and interaction via GD. The aim of piloting the semi-structured interview was to check the suitability and sufficiency of the interview questions. Two out of the four learners who had participated in the pilot study participated in the interview. After conducting the interview, the researcher noticed that the interview included sufficient questions that covered most of the important topics of the study. However, a topic related to the students' perceptions and experiences of the interaction with the teacher needed to be added to the interview of the experimental group. Therefore, the researcher added this section, as shown at the end of appendix G.

**Table 3.11** A summary of the study's changes

Area of change	Before piloting	After piloting
Duration of the students' GD training session	Two hours	Four hours
The framework for analysing the students' collaboration process	Type of collaborative behaviour 'Clarifying' was not included	'clarifying' was added to the framework.
The approach to analysing the learners' collaboration process	Analysing through adopting the five main themes	Providing an overall view of learners' levels of collaboration quantitatively.  Determining the level of learners' equality by quantitatively analysing the distribution of their contributions within their small groups, and mutuality by qualitatively analysing their level of engagement with each other's contributions.
The post- semi-structured interview	There were no questions about the students' perceptions of the teacher	A topic concerning the students' perceptions of their interactions with the teacher was added to the experimental group.

### **3.10 Ethical considerations, reliability, and validity**

Before, during and after conducting the study, the researcher made several ethical considerations. Obtaining permission to conduct the study from both the University of York, UK, and Al Qassim University, Saudi Arabia were the priority. According to Cohen et al., (2011) and Creswell (2005), authorised permission must be obtained when researching any specific phenomenon. The researcher contacted the Department of Education at the University of York at least three months before implementing the field study, supplying a comprehensive explanation of the purpose of the study, including details of its procedures. After receiving an official letter of permission from the University of York, the researcher contacted the ELD at Al Qassim University in Saudi Arabia to obtain their approval to conduct the study (see appendix M).

It is imperative that the researcher is open to the students inside the classroom and avoids deceiving them in any way (Berg, 2007). The researcher explained to the participants the procedures of the study, the length of the study, their rights to continue in the study or

withdraw at any time for any reasons, and clarified any risks or benefits. Because the students' ages were 19 and above, their parents' permission to participate in the study was not necessary. However, the students were given a consent form to fill in that indicated their agreement to participate in the study. When talking about the aim of the research, the researcher explained the study's benefits, such as how GMCW could develop the students' writing skills, without using any methods of persuasion to motivate the students to participate in the study. Furthermore, as a means of reducing anxiety, participants were respected for their choice not to participate in the GD during their examination period.

Any information presented during the study by the participants was completely confidential. Therefore, the researcher used pseudonyms to represent the students. The students' pre- and post-test scores and interview responses were stored in a protected folder that was accessible only to the researcher.

The equality of the study was improved by considering validity, credibility (internal validity), and reliability validity (Lincoln & Guba, 1985). To achieve the validity, the study's sample should be selected carefully; instruments and statistical analyses should be chosen appropriately (Cohen, Manion and Morrison, 2018). Another important consideration was that the possible advantages of the study's design should outweigh the risks. Research objectives and results should benefit students in a meaningful way. Therefore, neither the study nor its findings should harm the reputations or emotions of students. (Berg, 2007; Flick, 2006).

Credibility (internal validity), refers to the level of confidence in the validity and accuracy of the data and its interpretation (Mertens, 2005). In this study, the techniques employed to ensure credibility were those recommended by Carcary (2009), Merriam (1998), and Guba and Lincoln (1989). These included prolonged engagement and multiple data sources

(triangulation). Firstly, data were triangulated in this study to investigate the impact of GMCW with teacher intervention on learners writing outcomes. That is, not only were learners' outcomes examined using pre- and post-tests, but also learners' collaboration process data and interview data were used to provide a complete picture of the impact of the intervention. Secondly, prolonged engagement was adopted in this study. Three months of data collection and seven years of teaching in the exact context in which the study was conducted ensured a prolonged engagement with the study's context.

Reliability aims to ensure that all research methods and results are transparent and the process of research is conducted in a consistent manner (Carcary, 2009). An audit trail was created, which detailed the research activities, the methodology and analyses utilised, and reflections on the research process itself (Carcary, 2009). Data collection procedures (section 3.7) and data analysis procedures (section 3.8) were also documented in detail. By doing so, the reader will be able to determine whether the research was conducted according to systematic and proper research procedures.

In dealing with quantitative data in particular, two procedures were used to achieve reliability. First, in rating the pre- and post-tests, the two teachers who marked the students' essays and assigned scores based on a standardised rubric should be similar to each other when assessing the students' written essays. According to Larson-Hall (2010), big differences between markers makes the rating less reliable, whereas a small variation among judges is acceptable. Due to the similarity in ratings among the raters, mean scores were used in this study.

Second, the inter-coder reliability of the coding process was also considered. It was to ascertain whether two different coders had assigned the same codes to the same data (Silverman, 2006). To explain the framework and its categories, the researcher held a two-

hour training session with an ESL teacher with CALL experience. The teacher and researcher then independently coded random extracts. The percentage of agreement and disagreement between coders was calculated using Miles and Huberman's (1994) formula for inter-coder reliability. An 88.3% inter-coder agreement was achieved, and discrepancies were discussed and resolved.

### **3.11 Summary**

The chapter provided detailed descriptions of the current study's methodological issues. It began by restating the research goal and questions, then examined the research paradigm and strategy (i.e., the mixed method approach). That is the approach employed both quantitative (pre- and post-test written tasks and frequency counts of students' engagement in the collaboration process) and qualitative methods (extracts of student discussions and learners' interviews). The study participants' data was then provided. The chapter then explained the rationale for employing a quasi-experimental design to better understand the impact of GMCW with teacher intervention on promoting collaboration and writing outcomes in students' performance. The materials and instruments used for data collection were described in detail. The study's procedures were then explained in detail. The methods used for data analysis were described, and the pilot study was fully documented. Finally, the criteria for reliability and validity were discussed, as well as the ethical implications.

## **Chapter 4 Findings**

### **4.1 Overview**

This study, as mentioned in Chapter 1, was designed to investigate the extent to which online collaborative writing with teacher intervention affects EFL learners' writing outcomes. This investigation was achieved by comparing the impact of GMCW with and without teacher intervention on promoting learners' collaboration and improving their writing outcomes. This chapter aimed to present the samples' performance that seeks to answer the following research questions:

1. Will Saudi university EFL students who are engaged in GMCW with teacher intervention improve their writing outcomes in subsequent individual performance more than those who are engaged in GMCW without teacher intervention?
2. To what extent do Saudi EFL students collaborate when they engage in GMCW with teacher intervention, compared with those who collaborate in GMCW without teacher intervention?
3. Do differences in learners' patterns of interaction result in different writing outcomes?
4. What are students' perceptions of GMCW in the groups that have teacher intervention, compared to the groups that do not have such intervention?

In this chapter, the findings are shown through analysing the three different methods employed in this study (pre- and post-tests to examine the learners' writing outcomes, the students' comments in discussion mode and their revision behaviour in text mode to examine the level of learners' collaboration, and their perceptions of GMCW to examine learners' perspective of GMCW).

Given the aim of the study, it was essential to examine condition fidelity, that is, whether the teacher in the experimental condition did indeed facilitate collaboration as intended. Investigating the teacher's interventions revealed that he promoted learners' collaboration by intervening collaboratively (for more details see appendix K). After investigating the fidelity to the condition, the result of students' pre- and post-test scores were analysed and presented (section 4.2). Section 4.3 presents the results of the level of students' collaboration. Students' pre- and post-test outcomes in terms of their patterns of interaction is described in section 4.4. This is followed by section 4.5, which includes the EFL Saudi learners' perceptions of GMCW.

## **4.2 Writing completion**

### **4.2.1 Overview**

The purpose of assessing learners' writing completion scores was to examine the improvement of learners' writing outcomes in subsequent individual performance. Therefore, the following procedures have been used to answer this issue. First, comparing pre-test scores of essays written across the experimental condition and in the control conditions. Second, analysing pre- and post-test scores for the essays of students in the experimental and control conditions while analysing the students' scores, and the effect size was calculated to figure out whether there was a difference between the mean in two conditions.

### **4.2.2 Comparing pre-test scores of essays written across the experimental condition and in the control conditions**

According to Field (2009), if the data follow a normal distribution, parametric tests will be utilised; however, if the data do not follow a normal distribution, non-parametric tests will be utilised. In order to see if the data gathered from the tests was normally distributed or not, it



was examined numerically. A numerical representation was done by using two normality tests: namely the Kolmogorov-Smirnov test and the Shapiro-Wilk test. The Shapiro-Wilk test is suitable for use with samples of small size and has a higher level of accuracy than the Kolmogorov-Smirnov test (Field, 2009).

The findings of the Kolmogorov-Smirnov test and the Shapiro-Wilk test showed no statistically significant differences between the two conditions at pre-test: df (46), P. (>.200) in Kolmogorov-Smirnov and df (46), P. (>.196) in the Shapiro-Wilk test, as shown in appendix L-1.

Because the students' pre-test scores in the experimental and control conditions were normally distributed, Levene's test was employed to test the null hypothesis that the variances in different groups are equal. It is sufficient to know that the assumption of homogeneity of variances has been violated if the result of Levene's test is significant at  $p \leq .05$ . However, if Levene's test is not statistically significant ( $p > .05$ ), then the variances are about equal and the assumption is valid (Field, 2009). As shown in appendix L-2, the homogeneity indicates that the variance was equal for the experimental and control conditions at pre-test scores,  $F(1, 44)$ ,  $p > .05$ .

#### **4.2.3 Analysing pre-and post-test scores for the essays of students in the experimental and control conditions**

The Kolmogorov-Smirnov test and the Shapiro-Wilk test showed no statistically significant differences between the two conditions at pre-test; therefore, students' scores in both the pre- and post-tests essays were analysed using two-by-two mixed ANOVA to check whether there were any significant differences. Table 4.1 gives descriptive statistics for the two conditions of students for both pre and post-tests. The descriptive statistics shown are the mean and standard deviation.

**Table 4.1** Descriptive Statistics for pre- and post-tests across the two conditions

		<b>Experimental</b>	<b>Control</b>
<b>Pre-test</b>	<b>Mean</b>	22.0	21.1
	<b>Std. Deviation</b>	6.9	5.8
<b>Post-test</b>	<b>Mean</b>	37.7	31.4
	<b>Std. Deviation</b>	6.4	6.5

Table 4.2 shows that there was a significant main effect of scores (pre- and post-test) on the improvement of the students' writing outcomes,  $F(312)$ ,  $P < .001$ . Moreover, there was a significant effect between the scores (pre- and post-test) and the conditions (experimental and control),  $F(13.7)$ ,  $p < .001$ . This indicates that the students' writing scores differed in experimental and control conditions. To break down this interaction, contrasts were performed comparing each pre-test to the post-test across the experimental and control subjects. These revealed significant interactions when comparing experimental and control to post-test compared to pre-test.

**Table 4.2** Tests of within-subjects effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Scores (pre- and post-test)	Sphericity Assumed	3899.460	1	3899.460	312.150	<.001	0.876
Pre- and post-test * experimental & control conditions	Sphericity Assumed	172.58	1	172.058	13.773	<.001	0.252
Error (Scores)	Sphericity Assumed	549.660	44	12.492			

The last column gives the value of partial eta squared (which reflects the magnitude of the effect size). Here the value of partial eta squared indicates that the magnitude of these effects is large (0.876) since the higher the percentage of the dependent variable (close to 1), the more effect of the independent variable.

In addition, there was a significant interaction effect between the type of group (experimental and control) and the type of test (pre- and post-test) used. This indicates that tests had different effects on students' scores depending on the group. These revealed significant interactions when comparing experimental to control,  $F(4.4)$ ,  $p < .042$ ) as shown in Table 4.3.

**Table 4.3** Tests of between-subjects effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Groups	301.505	1	301.505	4.403	<.042	.091

The last column gives the value of partial eta squared. The value of partial eta squared indicates that magnitude of these effects is large (0.091).

#### 4.2.4 Summary of writing completion results

Statistically, the results showed there were significant differences for within-subjects (scores) and between-subjects (groups) in writing completion. In addition, the mean score in the

experimental condition performed better than the control group. Moreover, the value of partial eta squared indicated that the effect size of the independent variable was large.

### **4.3 GD-collaboration process**

#### **4.3.1 Overview**

To investigate how students collaborated in experimental and control conditions, an overall level of learners' collaboration across the two conditions was first provided. Next, interaction patterns between learners were identified.

#### **4.3.2 Overall level of learners' collaboration**

As a means of comparing the overall level of collaboration between the two conditions, learners' collaborative behaviours were quantified across both modes of GD interaction (discussion and text mode).

##### **4.3.2.1 Level of collaboration in discussion mode**

The frequency of learners' contributions to the discussion mode provided evidence that learners who engaged in GMCW with teacher intervention (experimental condition) collaborated better than those who performed the task in GMCW without their teacher intervention (control condition). Learners in experimental condition used the discussion mode effectively to discuss task planning, content and writing accuracy through social interaction. On the other hand, there was an absence of discussion among learners in the control condition. All small groups seemed not to plan their task and did not engage in cognitive or social interaction to co-construct their task. The following table illustrates the total number of comments generated by each condition.

**Table 4.4** The number of students' online comments

Type of Comments	Small groups of the experimental condition						Small groups of the control condition				
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)
<b>Planning comments</b>	7	42	46	13	19	32	1	0	2	1	4
<b>Cognitive comments</b>	84	237	210	102	117	131	1	1	7	0	4
<b>Social comments</b>	22	71	65	24	30	40	1	0	0	1	0
<b>Total</b>	113	350	321	152	166	203	3	1	9	2	8

As demonstrated in the table above, there was a big difference between the two conditions in terms of the number of generated comments. For example, in the experimental condition, groups 1, 4 and 5 generated over a hundred comments. Furthermore, groups 2, 3 and 6 generated a large number of comments (350, 321 and 203, respectively). In contrast, the total number of comments in the small groups of control condition were very sacred ranging from one to nine only. In addition, the table provides evidence of planning discussion among learners in the experimental condition, but not in the control condition. As there were generally a greater number of planning comments in experimental groups (ranging from 7 to 46) than in control groups (ranging from zero to four). A glance at the table above shows that the majority of learners' comments in the experimental condition dealt with cognitive interaction. All of the small groups posted more than half of their total number of comments to reciprocate various types of cognitive comments, such as seeking and providing feedback, requesting and providing clarification, offering suggestions, eliciting each other's opinion and elaborating on each other's ideas. However, based on the table above, it appears that the students in the control condition did not engage in cognitive interaction because each group made few cognitive comments (ranging from one to seven). Regarding the social comments, the frequent posting of social comments by all small groups in the experimental condition demonstrates that learners develop cohesive social relationships. Groups 1, 4 and 5, for

example, exchanged a considerable number of social comments (22, 24 and 30, respectively). Furthermore, groups 2, 3 and 6 posted a large number of social comments (71, 65 and 40, respectively) to express their positive feelings toward each other. On the other hand, the absence of social comments in all small groups of control conditions indicates that students did not form social relationships during the discussion. As shown in the table above, a single social comment was posted on the GD pages of groups 1 and 4 of the control condition, whereas none were posted by groups 2, 3 and 5.

#### 4.3.2.2 Level of collaboration in text mode

As reflected by the frequency of learners' contributions to the text mode, learners in the experimental condition also collaborated more effectively than learners in the control condition. Small groups in the experimental condition displayed a higher number of collaborative revision behaviours, while those in the control condition contributed moderately to the text. The table below shows the total number of revision behaviours performed by each condition.

**Table 4.5** The number of students' revision behaviours

Revision behaviours	Small groups of the experimental condition						Small groups of the control condition				
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)
<b>Adding</b>	56	98	98	44	72	61	29	43	35	12	25
<b>Deleting</b>	36	51	59	44	66	56	36	36	27	11	11
<b>Extending</b>	21	32	44	14	37	35	10	17	8	8	6
<b>Correcting formal errors</b>	34	47	53	36	49	46	40	35	26	36	31
<b>Total</b>	147	228	254	138	224	198	115	131	96	67	73

The table above shows that all small groups of the experimental condition contributed to the text more frequently than the small groups of the control condition. For example, groups 3, 2

and 5 of the experimental condition exhibited the highest total numbers of revision behaviours (254, 228 and 224, respectively). In addition, groups 6, 1 and 4 of the experimental condition also contributed to the text mode over a hundred times to revise their joint essay. Even though groups 1 and 2 of the control condition performed a large number of revision behaviours 115 and 131, respectively, their numbers were lower than the lowest number among the small groups of the experimental condition (138 performed by group 4), whereas groups 3, 4 and 5 of the control condition made fewer than a hundred contributions to their joint essay.

In terms of the types of revisions, it is evident from the table above that in both conditions the most frequent practice was adding ideas to the text, whereas the least frequent act was extending. However, learners in the experimental condition added more frequently new ideas to their joint essay as opposed to learners in the control groups. For example, the frequency of adding in the experimental condition varied between 98 and 44 times among the small groups, whereas it ranged from 43 to 12 times only among the small groups of the control condition. Moreover, it appears that students in experimental groups extended their own and other's ideas more than students in control groups because the highest instances of extended ideas in the experimental condition were 44 compared to only 17 in the control condition. Regarding deletion and correcting formal errors, the maximum number of deletions among the small groups of the control conditions was 36, which is the lowest number of deletions among the small groups of the experimental conditions. Similarly, experimental groups were more likely to correct their own and each other's formal errors than in control groups. According to the table above, in the experimental condition the highest number of instances of correcting formal errors was 53, while in the control condition this figure was only 40.

However, determining whether these revisions are self-revisions or other revisions is essential for measuring the collaboration levels of students. The level of students' contributions to their

own texts and to the texts of others indicates the extent to which they engaged with each other's contributions and the level to which they shared ownership of the joint essay. The following table classifies learners' revision behaviours into two categories: self-revisions and revisions of others.

**Table 4.6** Students' self-revision and other revision behaviours

Revision behaviours	Small groups of the experimental condition						Small groups of the control condition				
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)
<b>Total revision</b>	147	228	254	138	224	198	115	131	96	67	73
<b>Self-revision</b>	77	123	140	71	123	105	66	100	67	40	42
	52%	54%	55%	51%	55%	53%	58%	77%	70%	60%	58%
<b>Other-revision</b>	70	105	114	67	101	93	49	31	29	27	31
	48%	46%	45%	49%	45%	47%	42%	23%	30%	40%	42%

According to the table above, learners in experimental groups engaged effectively with each other's text as compared to those in the control condition. Under experimental conditions as illustrated by the table above, students contributed almost equally to their own texts and to those of their peers. Revisions on other's texts by students in all small groups accounted for approximately 50% of their total contributions, while self-revisions were graded at slightly above 50%. In contrast, students in the control groups contributed more to their own texts than to others' texts, as evidenced by the high number of revisions they made to their own texts. For example, groups 1, 4 and 5 made around 60% of their total revision to their own texts. Similarly, 70% of learners' revisions in groups 2 and 3 were self-revisions.

### 4.3.3 Patterns of interaction

The following sections aim to discuss how each small group across the two conditions approached the GD-collaborative task by examining their patterns of interaction based on Storch's (2002) criteria: equality and mutuality. It starts by providing a summary of the overall patterns of interaction that were observed across the two conditions. Following this a



detailed analysis of the level of equality and mutuality for each pattern is presented to compare the nature of learners' interaction under the two conditions.

#### **4.3.3.1 Overall patterns of interaction across the two conditions**

The quantitative and qualitative analysis of the collaboration process of each small group across the two conditions revealed that four patterns of interaction emerged in this study. A single pattern appeared in the control condition (*cooperative/passive*), while three different patterns emerged in the experimental condition (*collaborative*, *expert/novice* and *collaborative/passive*). In the experimental condition, every two groups out of the six had the same pattern. In the control condition, on the other hand, all five groups had *cooperative/passive* relationships, where some students contributed and others did not. Students in these groups took different approaches to cooperating as a team. In other words, two groups worked together by dividing the work into subsections and putting their individual efforts together to make a whole. In the other three groups, the students who contributed did not split the work between themselves but instead took on different roles (i.e., writer or editor). The interactional dynamics and characteristics of these patterns identified in the two conditions are summarised in Table 4.7.

**Table 4.7** Students' pattern of interaction

	Groups	Pattern of interaction
Experimental	3 and 5	<p><i>Collaborative</i></p> <p>The degree of equality and mutuality in the relationship formed by this pattern of interaction is high. Therefore, the most important characteristics of learners' collaboration are equal contributions and high levels of learners' interaction and engagement with each other's contributions.</p>
	1 and 6	<p><i>Collaborative/passive</i></p> <p>the level of mutual interaction was moderate to high in this pattern. In each group, three members participated equally in all aspects of the task and indicated high levels of mutual engagement and interaction. Whereas one member in each group remained passive.</p>
	2 and 4	<p><i>Expert/novice</i></p> <p>In this pattern of interaction, the level of mutuality and equality was moderate. Two expert students in each group took on greater responsibility for the task and encouraged the other two novices to interact and participate.</p>
Control	2 and 3	<p><i>Cooperative/passive</i> (by dividing the task)</p> <p>In this pattern, the degree of equality and mutuality is low. In each group, some learners divided the labour into subsections, and each learner worked individually in a particular section with low mutuality and little engagement in each other's contributions, whereas the other learners in the group remained passive and did not participate in the task.</p>
	1, 4, and 5	<p><i>Cooperative/passive</i> (by dividing the roles)</p> <p>The degree of equality and mutuality in the relationship formed by this pattern of interaction is low. In each group, some learner cooperated but rather than dividing the task, they divided the roles. One learner wrote the essay and another one learner adopted the role of editors with no mutual of interaction. While the remaining members adopted passive role and relied on others to complete the task.</p>

#### 4.3.3.2 Equality across the two conditions

The group's equality is reflected in the degree to which each student contributed to the discussion and text modes during the production of the group GD essay. The goal of this section is to compare the level of equality among small groups in both conditions. The analysis begins with an examination of the level of equality in each pattern of interaction appearing in the experimental condition. Next, it moves on to describe the degree of the control pattern's equality.

## Equality in experimental condition (GMCW with teacher intervention)

In the previous quantification analysis (section 4.3.2), it was shown that all small groups in the experimental condition used both modes (discussion and text) of GD effectively and generated a high number of collaborative comments and revision behaviours. However, the distribution of these collaborative comments and revision behaviours among the members of each group varied. Consequently, the level of equality varies from moderate to high based on learners' patterns of interaction (*collaborative*, *collaborative/passive* and *expert/novice*).

### 1. Collaborative pattern of interaction

The *collaborative* pattern in groups 3 and 5 is characterised by equal and high contributions to both GD modes during joint task completion. Table 4.8 shows the number and percentage of contributions made by each learner in these groups to the discussion mode. Table 4.9 shows the number and percentage of contributions each learner made to the text mode.

**Table 4.8** Learners' contribution to discussion mode in the *collaborative* pattern

Groups	Student name	Role	Number of comments per learner	Learner's interaction rate with group members
Group 3 <i>Collaborative</i>	Fozan	<i>Collaborative</i>	97	30%
	Mutawa	<i>Collaborative</i>	78	24%
	Omar	<i>Collaborative</i>	76	24%
	Ali	<i>Collaborative</i>	70	22%
Group 5 <i>Collaborative</i>	Mohammed	<i>Collaborative</i>	50	30%
	Mshari	<i>Collaborative</i>	59	36%
	Mujib	<i>Collaborative</i>	57	34%

As demonstrated by the table above, all four participants in Group 3 (Fozan, Mutawa, Omar and Ali) reported high instances of collaborative comments (97, 78, 76 and 70, respectively). There was clear evidence of equality in the learners' contributions from the interaction rate of each participant. The difference in proportion between learners is quite small, ranging from 6 to 8%. Similarly, members of Group 5 discussed the important aspects of the activity through

posting almost equal numbers of comments (50 to 59) on their GD page. As evidenced by the proportion, the difference in the size of each learner's contribution to the discussion mode was less than in Group 3. That is, Mohammed, Mshari and Mujib participated almost equally, with 30, 35 and 34%, respectively.

**Table 4.9** Learners' contribution to text mode in the *collaborative* pattern

Groups	Student name	Role	Number of revision behaviours per learner		Learner's rate of contribution to the GD-joint essay
			Self-text	Other's text	
Group 3 <i>Collaborative</i>	Fozan	<i>Collaborative</i>	38	26	25%
	Mutawa	<i>Collaborative</i>	36	33	27%
	Omar	<i>Collaborative</i>	33	28	24%
	Ali	<i>Collaborative</i>	33	29	24%
Group 5 <i>Collaborative</i>	Mohammed	<i>Collaborative</i>	42	28	32%
	Mshari	<i>Collaborative</i>	36	33	30%
	Mujib	<i>Collaborative</i>	45	40	38%

Furthermore, groups 3 and 5 took a collaborative stance in their contributions to the GD joint text. As shown in the table above, each member of these groups contributed equally to the joint essay and performed similar revisions on their own and others' texts. For example, the average percentage of each participant's contributions in Group 3 was over 20%. Moreover, all learners (Fozan, Mutawa, Omar and Ali) contributed almost equally to their own and others' texts to improve the quality and accuracy of their joint essay. Over 30 self-revisions were made to each member's text, while each member made more than 25 revisions to other's texts. Similarly, each learner in Group 5 (Mohammed, Mshari and Mujib) contributed about one-third of the total joint essay. Their engagement with each other's texts was as close as their engagement with their own texts, in which each learner made between 28 to 40 revisions to their friend's text, whereas the number of self-revisions to each learner's text was rated from 36 to 45.

## 2. Collaborative/passive pattern of interaction

The distribution of generating comments and revision behaviours among learners in groups 1 and 6 provides evidence that these groups displayed *collaborative/passive* relationships. Three learners in each group took a more collaborative stance and demonstrated a high level of equality by generating a high and equal number of collaborative comments as well as revision behaviours, while one learner in each group was passive. The flowing tables illustrate the level of equality in learners' contribution to the both mods of GD interaction.

**Table 4.10** Learners' contribution to discussion mode in the *collaborative/passive* pattern

Groups	Student name	Role	Number of comments per learner	Learner's interaction rate with group members
Group 1 <i>Collaborative/passive</i>	Ameen	<i>Collaborative</i>	39	34.5%
	Osama	<i>Collaborative</i>	37	33%
	Basil	<i>Collaborative</i>	30	26.5%
	Raid	<i>Passive</i>	7	6%
Group 6 <i>Collaborative/passive</i>	Amr	<i>Collaborative</i>	80	39%
	Abdullah	<i>Collaborative</i>	60	30%
	Nawaf	<i>Collaborative</i>	52	26%
	Ibrahim	<i>Passive</i>	11	5 %

The above table shows the extent to which each member in these groups contributed to the discussion mode. In Group 1, Ameen, Osama and Basil each posted over 30 comments. Accordingly, Ameen, Osamaa and Basil contributed and interacted almost equally during the discussion (34.5%, 33.5% and 26.5% respectively). In contrast, Raid posted only 7 comments, accounting for only 6% of the group's interaction. Similarly, in Group 6, Amr, Abdullah and Nawaf had almost an equal amount of interaction when discussing all aspects of writing (39%, 30% and 26% through posting 80, 60 and 52 comments, respectively), while Ibrahim was silent, posting only 11 comments (6% of the total number of comments in this Group).

**Table 4.11** Learners' contribution to text mode in the *collaborative/passive* pattern

Groups	Student name	Role	Number of revision behaviours per learner		Learner's rate of contribution to the GD-joint essay
			Self-text	Other's text	
Group 1 <i>Collaborative/passive</i>	Ameen	<i>Collaborative</i>	26	23	33%
	Osama	<i>Collaborative</i>	20	19	27%
	Basil	<i>Collaborative</i>	26	21	32%
	Raid	<i>Passive</i>	5	7	8%
Group 6 <i>Collaborative/passive</i>	Amr	<i>Collaborative</i>	31	29	30%
	Abdullah	<i>Collaborative</i>	26	22	24%
	Nawaf	<i>Collaborative</i>	21	26	24%
	Ibrahim	<i>Passive</i>	27	16	22%

As the table above shows, the level of equality in how learners contributed to the text mode was the same as in the discussion mode. That is, the same three students in each group worked together and took part in the text mode often and equally. There was, however, a fourth student in each group who took a passive role, either by relying on others and not participating in most of the writing stages (*free rider*) or by taking a *social loafer* role, where the learner contributed very little to the GD essay. In the case of Group 1, Ameen, Osama and Basil contributed equally to the GD joint essay and made many revisions to produce an accurate and high-quality joint text. Their contributions to the GD joint essay were 33%, 27% and 32% respectively. Furthermore, their revision behaviours were not only restricted to their texts, but also some of these revisions were made on others' texts (the numbers of self-revision were 26, 20 and 26, while the numbers of revision behaviours on others' texts were 23, 19 and 21 respectively). However, the passive learner in this group (Raid) did not contribute to the joint text effectively and adopted a *free rider* role by making only five self-revisions and seven revision practices on others' text. In a similar manner, three collaborative learners (Amr, Abdullah and Nawaf) in Group 6 demonstrated a high level of equality during

contributing to the GD joint essay. Amar made 30% of all revisions, while Abdullah and Nawaf also made significant contributions (24% for each). Similar to how they contributed to their own text, they also contributed to the texts of others; in fact, nearly half of each member's contributions were to the texts of others. Although Ibrahim contributed a considerable amount (22%) to the group essay, he did so without engaging in any ongoing discussion with the other members of the group. This contribution appears to be made primarily in response to the teacher's notification (this action will be interpreted in the qualitative analyses later).

### **3. *Expert/novice* pattern of interaction**

The distribution of learner-generated comments and revision behaviours in groups 2 and 4 displaying *expert/novice* relationships was not equal. Therefore, learners in this pattern demonstrated a moderate level of equality, as those who assumed the position of expert contributed more than those who assumed the role of novice. Despite this, novices exhibited moderate equality and did not assume a passive stance. The tables below illustrate the degree to which experts and novices contributed to the GD joint essay.

**Table 4.12** Learners' contribution to discussion mode in the *expert/novice* pattern

Groups	Student name	Role	Number of comments per learner	Learner's interaction rate with group members
Group 2 <i>Expert/novice</i>	Bader	<i>Expert</i>	91	26%
	Asim	<i>Expert</i>	80	23%
	Salah	<i>Expert</i>	79	23%
	Abdurrahman	<i>Novice</i>	50	14%
	Sayer	<i>Novice</i>	50	14%
Group 4 <i>Expert/novice</i>	Ajlan	<i>Expert</i>	60	39%
	Harbi	<i>Expert</i>	52	34%
	Rseeny	<i>Novice</i>	19	13%
	Firas	<i>Novice</i>	21	14%

As demonstrated in Table 4.12, learners playing the role of experts in Group 2 (Bader, Asim and Salah) posted many and almost equal comments to organise the task and encourage the other novice learners to participate in the task (91, 80 and 79, respectively). Bader generated 26% of the interaction with group members on the GD page, while Salah and Asim contributed 23% each. Abdurrahman and Sayer, who were novice learners, contributed fairly to the discussion and generated a similar number of comments (50, or 14% for each). As in the case of Group 2, learners acting as experts in Group 4 engaged in the discussion frequently to take the responsibility of organising the task and guiding the novices. As shown in the table above, Ajlan and Harbi, who act as experts in this group, generated a high number of comments compared to the other novices' participants (Rseeny and Firas). Each expert posted more than 50 comments that represent 70% of interaction rate in their group, whereas the percentages of novices' posted comments (Rseeny and Firas) were 13% and 14%, respectively.



**Table 4.13** Learners' contribution to text mode in the *expert/novice* pattern

Groups	Student name	Role	Number of revision behaviours per learner		Learner's rate of contribution to the GD-joint essay
			Self-text	Other's text	
Group 2 <i>Expert/novice</i>	Bader	<i>Expert</i>	34	30	28%
	Asim	<i>Expert</i>	31	27	25%
	Salah	<i>Expert</i>	29	28	25%
	Abdurrahman	<i>Novice</i>	18	9	12%
	Sayer	<i>Novice</i>	11	11	10%
Group 4 <i>Expert/novice</i>	Ajlan	<i>Expert</i>	23	29	38%
	Harbi	<i>Expert</i>	22	18	29%
	Rseeny	<i>Novice</i>	13	11	17%
	Firas	<i>Novice</i>	13	9	16%

As demonstrated in the table above, learners' contributions to text mode in the *expert/novice* pattern also show evidence of unbalanced contributions between experts and novices. In Group 2, the experts (Bader, Asim and Salah) contributed significantly to the GD joint essay, as their rate of contribution was at least 25% per expert. By contrast, novice students (Abdurrahman and Sayer) showed a moderate contribution (12% and 10%, respectively). In Group 4, similarly, the expert learners (Ajlan and Harbi) contributed 38% and 29%, respectively, to the GD joint essay, while the novice learners (Rseeny and Firas) contributed slightly more than 15%. However, according to the table above, both experts and novices in these groups performed an almost comparable number of revisions to their own texts and on others' texts when revising the GD joint essay.

#### **Equality in the control condition (GMCW without teacher intervention)**

The quantitative analysis in section 4.3.2 demonstrates that all small groups in the control condition completed their GD online essay by contributing to the text mode without engaging in any discussion. A distribution of learners' contributions to the discussion mode revealed

that one or two members of each group initiated the discussion by posting a few comments, but other members of the group did not reciprocate. Whereas, the distribution of the revision behaviour in text mode among learners revealed that all small groups exhibited a *cooperative/passive* relationship, with some students cooperating while others remained inactive.

### 1. *Cooperative/passive* pattern of interaction

Learners in this pattern indicated a low level of equality. Most of the learners who cooperated to complete their task used the discussion to post a few comments; however, learners who adopted a passive role remained salient during the writing of the GD joint essay. The tables below detail how students contribute to the two modes of GD interaction.

**Table 4.14** Learners' contribution to discussion mode in the *cooperative/passive* pattern

Groups	Student name	Role	Number of comments per learner
Group 1 <i>Cooperative/passive</i>	Hagie	<i>Cooperative</i>	3
	Turki	<i>Cooperative</i>	0
	Abdelaziz	<i>Passive</i>	0
	Saad	<i>Passive</i>	0
	Saud	<i>Passive</i>	0
Group 2 <i>Cooperative/passive</i>	Khaled	<i>Cooperative</i>	1
	Jihad	<i>Cooperative</i>	0
	Salman	<i>Cooperative</i>	0
	Fahad	<i>Passive</i>	0
Group 3 <i>Cooperative/passive</i>	Almaee	<i>Cooperative</i>	5
	Abdallah	<i>Cooperative</i>	3
	Abdul Malek	<i>Passive</i>	0
	Omron	<i>passive</i>	0
Group 4 <i>Cooperative/passive</i>	Bachir	<i>Cooperative</i>	2
	Twejri	<i>Cooperative</i>	0
	Fayed	<i>Passive</i>	0
	Foheid	<i>Passive</i>	0

Group 5 <i>Cooperative/passive</i>	Misbah	<i>Cooperative</i>	4
	Rasheed	<i>Cooperative</i>	4
	Abbas	<i>Passive</i>	0
	kthery	<i>Passive</i>	0
	Faisal	<i>Passive</i>	0

As shown in the above table, the few comments written by each student in each group are insufficient to evaluate their degree of equality. For instance, in Group 1, only the cooperative learner (Hagie) utilised the discussion mode to submit a few comments, whereas the other learners did not. Similarly, Khaled initiated the discussion in Group 2 by submitting one comment. No one in the group, however, reciprocated his initiative. The cooperative learners (Almaee and Abdallah) in Group 3 used the discussion mode to post a few comments (five and three, respectively) whereas the passive learners did not. As in groups 1 and 2, only Bachir posted comments on the Group 4, while other members did not participate in the discussion mode. Misbah and Rasheed made four comments each on Group 5's GD comments page, while the other passive students did not.

However, the distributions of revision behaviours in text mode across learners in each group indicated that learners had a low level of equality. Some learners completed the work cooperatively while others remained passive. Contributing learners adopted the cooperative method in two different ways. That is, active learners in two groups (2 and 3) wrote the online text together, divided their labour during the writing process, and compiled their independent efforts into a final product. Instead of cooperating by dividing the task, only one learner wrote the GD essay in groups 1, 4, and 5, and another one edited it. Table 4.15 illustrates the distribution of revision behaviours among learners who cooperated through task division, while Table 4.16 displays the distribution of revision behaviours among learners who cooperated through role division.

**Table 4.15** Learners' contribution to text mode in the *cooperative/passive* pattern by dividing the task

Groups	Student name	Role	Number of revision behaviours per learner		Learner's rate of contribution to the GD-joint essay
			Self-text	Other's text	
Group 2 <i>cooperative/passive</i>	Khaled	<i>Cooperative</i>	35	15	38%
	Jihad	<i>Cooperative</i>	30	9	30%
	Salman	<i>Cooperative</i>	32	7	30%
	Fahad	<i>Passive</i>	3	0	2%
Group 3 <i>cooperative/passive</i>	Almaee	<i>Cooperative</i>	28	10	40%
	Abdallah	<i>Cooperative</i>	26	12	40%
	Abdul Malek	<i>Passive</i>	8	2	10%
	Omron	<i>Passive</i>	5	5	10%

According to Table 4.15, the level of equality among learners was low and there was a clear relationship between learners' rates of contribution to the GD joint essay and their role in the group. In the case of group 2, the three participants, Khaled, Jihad and Salman, contributed to the task by dividing the work between them. They each provided roughly 30% of the total text to complete their individual sections. In contrast, it is clear from the table above that Fahad was the only learner who remained passive by contributing only three times during the writing process. Moreover, the number of learners' revision behaviours in their own text and in texts written by other provided clear evidence that the learners worked individually. Khaled made 15 contributions to others' texts, as opposed to 35 contributions to his own text. Also, Jihad and Salman contributed frequently to their own texts (30 and 32 contributions, respectively), but they rarely edited other members' texts (9 and 7 times, respectively). Similarly, two students in group 3 (Almaee and Abdallah) divided the task and contributed equally (40%). They also contributed to their own text more frequently (28 and 26 times, respectively) than to each other's text (10 and 12 times, respectively). whereas the other two

students in the group (Abdul Malek and Omron) stayed inactive, contributing 10% to the GD essay.

**Table 4.16** Learners' contribution to text mode in the *cooperative/passive* pattern by dividing the roles

Groups	Student name	Role	Number of revision behaviours per learner		Learner's rate of contribution to the GD-joint essay
			Self-text	Other's text	
Group 1 <i>Cooperative /passive</i>	Hagie	<i>Cooperative</i>	43	17	52%
	Turki	<i>Cooperative</i>	11	28	34%
	Abdelaziz	<i>Passive</i>	6	0	5%
	Saad	<i>Passive</i>	4	2	5%
	Saud	<i>Passive</i>	2	2	4%
Group 4 <i>Cooperative /passive</i>	Bachir	<i>Cooperative</i>	38	2	60%
	Twejri	<i>Cooperative</i>	1	23	36%
	Fayed	<i>Passive</i>	1	1	3%
	Foheid	<i>Passive</i>	0	1	1%
Group 5 <i>Cooperative /passive</i>	Misbah	<i>Cooperative</i>	33	1	47%
	Rasheed	<i>Cooperative</i>	4	30	47%
	Abbas	<i>Passive</i>	5	0	6%
	Kthery	<i>Passive</i>	0	0	0%
	Faisal	<i>Passive</i>	0	0	0%

As seen in the table above, groups exhibiting a *cooperative/passive* pattern by dividing the roles displayed a low level of equality, as only two members of each group participated to complete the GD essay while the rest of the members remained passive. Furthermore, the number of revision behaviours per learner demonstrates that these students collaborated by dividing the roles rather than the essay. Among the students in Group 1, only Hagie and Turki contributed to the GD essay; however, Hagie's contribution as a writer was 52%, while Turki's contribution as an editor was 34%. In addition, the number of learners' revision behaviours on their own and on other's texts indicated that Hagie frequently contributed to

his own text to compose the essay (43 times), whereas Turki contributed to the task to revise his colleague's text (28 times). The other three members (Abdelaziz, Saad and Saud) were inactive and contributed 5% or less to the text. In the same vein, Group 4 had only two learners who contributed to the GD essay, but Bachir wrote 60% of it and Twejri edited 38% of it. The number of times students contributed to their own and others' texts reflected the different roles they played in the learning process. Twejri, for example, contributed to the author's text 23 times, while Bachir, as a writer, made 38 contributions to his text. The other two members of this group, Foheid, and Fayed, took a more passive approach, contributing to the task only once or twice. In Group 5, two learners divided the roles as well; however, both the writer (Misbah) and editor (Rasheed) contributed equally to the GD essay (47%). Misbah performed all his contributions to his own text with the exception of one, whereas Rasheed performed all but four of his contributions to Misbah's text. The other members of the group (Abbas, Kthery and Faisal) were passive and contributed nothing to the task except for Abbas, who contributed 6%.

**Table 4.17** A summary of learners' level of equality across the two conditions

Level of equality	
Experimental condition (GMCW with teacher intervention)	Control condition (GMCW without teacher intervention)
<p>Regardless of learners' patterns of interaction, the level of equality of learners who collaborate with teacher intervention ranged from moderate to high.</p> <p>All learners displayed a <i>collaborative</i> pattern engaged with a high level of equality.</p> <p>Learners who formed a <i>collaborative/passive</i> relationship exhibited a moderate level of quality, since there was one learner in each group of this pattern assumed the role of passive.</p> <p>Learners in an <i>expert/novice</i> relationship exhibited a moderate level of equality. Even though learners who assumed the role of expert contributed more than novices, novices did not remain inactive; they made a considerable contribution to both modes of interaction.</p>	<p>All learners who collaborated without teacher intervention showed a low level of equality.</p> <p>All learners displayed a <i>cooperative/passive</i> relationship, where most of them adopted a passive role and a few learners in each group contributed to the task.</p>

## **Mutuality across the two conditions**

The degree to which group members are willing to engage with each other's contributions in both GD modes of interaction indicates the group's mutuality. In order to investigate the level of mutuality in each small group across the two conditions, the level of mutual interaction between students in discussion mode and their mutual engagement with one another's contributions in text mode were qualitatively analysed. The manner in which data is reported will correspond to the manner in which categories are reported in the taxonomies of the two modes of interaction (section 3.8.1.2.1). The analysis starts with an examination of the level of mutuality in each pattern of interaction identified in the experimental condition. Following that, the degree of mutuality in the control pattern is described.

## **Mutuality in experimental condition (GMCW with teacher intervention)**

The level of learners' mutuality in the experimental condition varies from moderate to high based on the learners' patterns of interaction identified in this condition (*collaborative, collaborative/passive and expert/novice*).

### **1. Collaborative pattern of interaction**

A qualitative analysis of students' interaction and contributions in groups 3 and 5 suggested that the level of mutuality was high in these groups. All students in these groups discussed the important aspects of the activity through obvious engagement with one another and reliance on each other's knowledge. They maintained consensus and a mutual understanding that enabled them to complete the task collaboratively. The following examples illustrate how they interacted mutually while completing the task.

## **Planning interaction**

It was clear from students' interaction at the organising stage that learners in groups 3 and 5 planned the task collaboratively and shared the decision-making and the authority over the

task. The following extracts from the GD history page of these groups show how the learners planned the task collaboratively.

**Extract 2:** Group 3

Google Doc interaction	Types of comments/edits
<p>Teacher wrote</p> <p>Write collaboratively an essay in English about the following topic:</p> <p>Some people think that online learning is better than classroom learning. To what extent do you agree or disagree with the statement? Give reasons and example to support your answer.</p>	Adding to the text
<p>Teacher said</p> <p>Hi my dear students, could you please read the topic and work together? I would like to remind you to respect the contributions of each other and collect your ideas collaboratively. First, you should discuss whether you agree or disagree with the statement.</p>	Greeting + Giving instructions
<p>Ali (collaborative learner) said</p> <p>Hi friends, so, do you agree or disagree with the statement?</p>	Greeting + Eliciting
<p>→ Fozan (collaborative learner) said</p> <p>First, I think we should decide whether we go 100% or 50% with the statement.</p>	Organising the work +Suggesting
<p>→ Ali (collaborative learner) said</p> <p>Yeah, you are right we should.</p>	Showing agreement
<p>Fozan (collaborative learner) said</p> <p>if we go 50% it will give us more reasons and ides to use in the essay. But if we go 100% the essay will be more focused, what do you think?</p>	Organising the work+ Suggesting +Justifying
<p>→ Mutawa (collaborative learner) said</p> <p>I agree that 50% it's a good and give us chance to write more example.</p>	Showing agreement
<p>→ Ali said (collaborative learner) said</p> <p>Yes, 50% might be good, because we could get more reasons.</p>	Showing agreement
<p>→ Omar (collaborative learner) said</p> <p>You are right, I think 50% is a good choice for us.</p>	Showing agreement
<p>Mutawa (collaborative learner) said</p> <p>Ok dear friends now go ahead to start the pre-writing stage.</p>	Requesting
<p>→ Fozan (collaborative learner) wrote</p> <p>Pre-writing Stage:</p> <p>1/ Reasons that agree with the topic:</p>	Adding new idea



Convenient	
→ Ali (collaborative learner) wrote Better time management	Adding new idea
→ Mutawa (collaborative learner) wrote Collaborative way of learning	Adding new idea
→ Fozan (collaborative learner) wrote 2/ Reasons that disagree with the topic: This type of education is bad for children and really can affect their social skills.	Adding new idea
→ Omar (collaborative learner) wrote There is no feedback in online classes	Adding new idea

The above extract comes from the GD history page of Group 3. After posting the question and instructions by teacher, Ali initiated the activity by posting the first comment. He asked his group members whether they agree with the statements of the essay topic. Fozan replied to Ali and drew other group members' attention to the importance of deciding whether to dis/agree with the statement completely or partially. Ali agreed with Fozan's suggestion. after that Fozan suggested that agreeing partially with the statement of the topic would provide them with the opportunity to extend their essay, since they would be able to collect more reasons and examples. In responding to Fozan, all members of the group engaged in a collective decision-making process and agreed with Fozan's suggestion. After that Mutawa invited his friends, using a friendly tone, to initiate the pre-writing stage. His request was considered by his group members, who responded by taking turns to post reasons to dis/agree with the statement.

### Extract 3: Group 5

Google Doc interaction	Types of comments/edits
<p>Mshari (collaborative learner) wrote</p> <p>Pre-writing stage</p> <p>Planning</p> <p>collecting ideas of the topic</p>	Adding to the text
<p>Mujib (collaborative learner) wrote</p> <p>Outline:</p> <p>Introduction:</p> <p>Hook:</p> <p>Background information:</p> <p>Thesis statement:</p>	Adding to the text
<p>Mohammed (collaborative learner) wrote</p> <p>Body paragraph 1:</p> <p>Topic Sentence:</p> <p>Supporting Details:</p>	Adding to the text
<p>Mujib (collaborative learner) wrote</p> <p>Body paragraph 1:</p> <p>Topic Sentence:</p> <p>Supporting Details:</p>	Adding to the text
<p>Teacher said</p> <p>You have made good effort to plan the essay. However, dear students, make sure to decide through discussion collaboratively whether you agree or not with the statement before starting to write.</p>	Encouraging + Promoting collaborative discussion
<p>Mshari (collaborative learner) said</p> <p>Hi every one, what do you think, should we write our essay as if we agree that online learning is better or disagree? So, we can then start writing the ideas.</p>	Greeting + Eliciting organising the work + Suggesting
<p>→ Mujib (collaborative learner) said</p> <p>What do you want Mshari, to agree or disagree with the statement?</p>	Eliciting
<p>→ Mshari (collaborative learner) said</p> <p>for me I suggest that we agree totally.</p>	Suggesting
<p>→ Mujib (collaborative learner) said</p> <p>Great idea, I agree also</p>	Encouraging+ Showing agreement
<p>Mohammed (collaborative learner) said</p>	Showing agreement

For me I agree also	
Mujib (collaborative learner) wrote Online learning has flexible schedule, teacher can easily shear images and links.	Adding new idea
Mshari (collaborative learner) wrote saving the fuel money.	Adding new idea
Mohammed (collaborative learner) wrote You can record the lessons.	Adding new idea

Similarly, in the case of Group 5, all participants (Mohammed, Mshari and Mujib) were actively involved in planning the task after teacher's guidance. Extract 3 illustrates how learners' collaboration was initially limited to contributing to the text without engaging in discussion. So, the teacher intervened, emphasising the importance of collaborative discussion about whether they agreed with the statement of the essay topic before beginning writing. On behalf of his students, Mshari replied to the teacher by posting the first comments. He greeted his friends and elicited their opinions about the statements. Frequently using first-person plural pronouns (we, our), as can be seen in Extract 3, reflects that he had a sense of text ownership and he aimed to engage all group members in making decisions. Instead of answering Mshari's question by posting his opinion, Mujib redirected the question to Mshari to find out his opinion first. It seems that Mujib was also intending to help his fellow students make one clear decision about organising the task. Mshari replied to Mujib and suggested completely agreeing with the topic statement. Mujib welcomed and agreed with Mshari's suggestion. Following the sequence of dialogue between Mshari and Mujib, Mohammed engaged with them and showed his agreement with their opinions. After that, all learners collected their ideas collaboratively.

## Cognitive interaction

Interaction data from groups 3 and 5 revealed that all students engaged mutually in a collaborative dialogue to consider language use, seek and give feedback, and help each other to co-construct new knowledge by eliciting each other's opinions, justifying their contributions and clarifying each other's ideas. The following extracts (4 and 5) from the GD history page of these groups provide clear evidence that learners in these groups exhibited high mutual cognitive engagement:

The observation of learners' data in Group 3 showed that learners engaged in a collaborative dialogue to co-construct new knowledge. The following extract from Group 3 data illustrates this process of co-constructing knowledge through various collaborative behaviours displayed by students.

### Extract 4: Group 3

Google Doc interaction	Types of comments/edits
Omar (collaborative learner) said Should we start with the conclusion? I think we gave enough details in the two body paragraphs. What do you think?	Organising the work + Suggesting + Eliciting
→ Mutawa (collaborative learner) wrote In conclusion, many people think that online classes are better than traditional classes, but actually both studying all majors.	Adding new idea
→ Omar (collaborative learner) wrote At the end, it is about preference, some people like convenient online classes and others prefer traditional classes for a better quality and experience.	Adding new idea
Omar (collaborative learner) said May I have a bit of your precious time guys, we need feedback on these sentences which one is suitable for the conclusion?	Seeking feedback
→ Fozan (collaborative learner) said They are both good sentences, we can combine them.	Praising + Suggesting
→ Ali (collaborative learner) said Yeah, I agree with Fozan if we combined the two, we could get a good conclusion.	Showing agreement

<p>→ Omar (collaborative learner) wrote</p> <p>In conclusion, many people think that online classes are better than traditional classes. But, at the end it is about preference. Some people like convenient online classes while others prefer traditional classes for better quality and social experience. but actually, both studying all majors to students.</p>	Rewriting the new ideas
<p>→ Omar (collaborative learner) said</p> <p>This is how it looks after I combined them with a bit of editing, what do you think?</p>	Acknowledging + Eliciting
<p>→ Mutawa (collaborative learner) said</p> <p>It is good combine Omar.</p>	Encouraging
<p>→ Omar (collaborative learner) said</p> <p>Good to know guys, with your help we made really good work, thanx.</p>	Acknowledging + Thanking
<p>Ali (collaborative learner) said</p> <p>Excuse me guys but can you explain this sentence for me? I couldn't understand it. (both studying all majors to students)</p>	Requesting
<p>→ Fozan (collaborative learner) said</p> <p>Actually, I don't understand it either. I think he means that both are suitable for all majors. It is good sentence but it needs to be restructured.</p>	Providing feedback
<p>→ Mutawa (collaborative learner) said</p> <p>Guys please you can edit or delete in the sentence, but what I mean that in both we study all majors in (online and traditional)</p>	Clarifying
<p>→ Omar (collaborative learner) said</p> <p>How about if we say in the last sentence:</p> <p>However, online and traditional classes both practical and beneficial to students in all majors.</p>	Providing feedback + Eliciting
<p>→ Mutawa (collaborative learner) said</p> <p>It is so good Omar, I will edit it; you did great, thanx</p>	Praising+ Acknowledging
<p>→ Omar (collaborative learner) said</p> <p>Thanx Mutawa we all did a great job</p>	Thanking
<p>→ Ali said (collaborative learner) said</p> <p>Excellent work guys</p>	Encouraging
<p>Fozan (collaborative learner) said</p> <p>Sorry for leaving early this morning, you did a great work on the conclusion. I will do some editing and let me know if it is better or I should remove it.</p>	Apologising + praising + Acknowledging + Seeking feedback
<p>Fozan (collaborative learner) wrote</p> <p>In conclusion, many people think that online classes are better than traditional classes. <del>But, at the end it is about preference.</del> But <u>in</u> the end is a matter of preference. Some people like online classes for <u>its convenience</u> <del>convenient online classes</del> while others prefer traditional classes for a better quality and social experience. <u>however</u>,</p>	Correcting another's writing

online and traditional classes are both practical and beneficial to students in most majors. but actually, both studying all majors to students.	
→ Ali (collaborative learner) said  Excuse me Fozan, but why did you change it to “most” instead of “all”? explain it to me please.	Requesting
→ Omar (collaborative learner) said  Could you please also explain why you add (are) before (practical and beneficial)	Requesting
Teacher said  Thank you all for your collaboration. You are an excellent group. I’m happy to see you exchange feedback, help, and encourage each other to co-construct sentences. However, I would like to remind you that if you make changes, you should mention politely why you made them.	Thanking, + praising + promoting group cohesion
→ Fozan (collaborative learner) said  Sorry teacher and my friends.  Guys, I think online classes isn’t available for all majors, because some require practice and training like nursing and medical school, so, I change (all) to (most) what do you think. Regarding adding (are) because there was no verb in the sentence.	Justifying + Eliciting
→ Omar (collaborative learner) said  Mmmmm You are right because practical is adjective, thanx my friend	Showing agreement+ Thanking
→ Ali (collaborative learner) said  Oh yeah, thank you for explaining.	Showing agreement+ Thanking

In the previous example, the learners’ collaborative interaction began with Omar’s suggestion to start writing the conclusion of the essay, since a lot of information had been written. Both Omar and Mutawa started the process of writing the conclusion by adding their ideas to the GD page in a parallel mode. Following that, Omar sought feedback from others in order to select the most appropriate sentence for the conclusion. Fozan responded by praising their writing and suggesting that the two sentences be combined. Fozan’s suggestion was appreciated by Ali, and he agreed that combining Mutawa’s and Omar’s conclusions would produce a good and full conclusion. In response to his friends’ suggestion, Omer combined the sentences in text mode and informed them in discussion mode of what he had done. Mutawa posted a comment in reply to encourage Omar and praise his work. Omar politely expressed that the great work was a collaborative endeavour. Clearly, Omar’s comment

reflects a sense of a joint ownership of the text produced. Following that, Ali and Fozan left additional comments in which they investigated the meaning of Mutawa's final sentence.

When disagreements over the meaning of the sentence arose, the group resolved this disagreement by discussing how to best express their ideas. As shown in the extract above, Ali asked his friends to explain the sentence since it seemed he was finding it difficult to understand. Although Fozan explained the meaning of the sentence, he acknowledged that he did not understand it either. In addition, he suggested restructuring the sentence to make it clearer. Out of respect for their opinion, Mutawa gave his friends permission to edit his sentence and he clarified what he intended to write. The difficulty Mutawa faced in expressing what he intended prompted Omar to scaffold him. As can be seen from the extract above, after Mutawa clarified the meaning of the sentence that he had written, Omar posted a comment. In this comment, Omar restructured the sentence based on Mutawa's clarification. Mutawa exhibited collaborative behaviours in accepting Omar's restructuring of the sentence, not only by praising Omar's comment but also by incorporating his suggestion into the online joint text.

Then the learners (Ali, Omar and Mutawa) exchanged social comments, whereby they encouraged each other and showed a sense of belonging to the group. Fozan engaged in a discussion later and apologised for leaving early in the morning. He complimented his friends' work and informed them that he would do some editing to what they had written. It is clear that Fozan valued his friends' feedback. As he explicitly stated in his posted comment, his friends have the right to keep or remove his edits. Omar and Ali then posted comments to ask Fozan to explain the reason behind his editing. However, Fozan did not justify his editing to his friends. Therefore, the teacher intervened to reinforce group cohesion. He posted a comment encouraging the learners by praising their work and guiding them towards certain behaviours. In particular, he promoted group cohesion by encouraging them to respect each

other's writing and avoid deletion without discussion. Fozan posted a comment in reply in which he apologised to his teacher and friends. He provided content and language feedback to justify his previous editing and sought the others' feedback on its accuracy. Fozan's justification provides his friend with a learning opportunity. This is clear by their use of the discourse markers "mmm" and "oh" in their reply comments. As an example, Omar realised that "practical" is an adjective, and thus the sentence needs a verb. In addition, Fozan's editing behaviours appear to have been accepted by another group member (Mutawa), as the final text incorporated Fozan's suggestion.

Similarly, learners in Group 5 engaged in a collaborative dialogue to deliberate over language use. For example, the following extract illustrates that online collaborative activity offered learners the opportunity to get involved in mutual interaction, to correct each other over the use of the verb commute, to pool their linguistic knowledge, and to provide and receive confirmation and encouragement:

**Extract 5:** Group 5

Google Doc interaction	Types of comments/edits
Mshari (collaborative learner) wrote When you learn online, you do not have to commute to university every day	Adding new idea
→ Mohammed (collaborative learner) said My friend Mshari, I think it's better here to write "commute from one place to another" because studying could be in any place not just a university. What do you think?	Providing feedback + Suggesting + Eliciting + Justifying
→ Mshari (collaborative learner) said Yes, you are right, thanks for reminding me.	Showing agreement + Thanking
→ Mshari (collaborative learner) wrote you do not have to commute <u>from one place to another to work every day</u>	Correcting own writing
→ Mohammed (collaborative learner) said I think it's better here to use something related to studying not work. For example, "commute to a place of studying" do you think I am right in using commute dear friends?	Providing feedback + Eliciting
→ Mujib (collaborative learner) said But I think it is better if we say teachers do not have to commute, and we	Providing feedback +Justifying



should delete (to work) and make it commute only because the word commute alone means going every day to work	
→ Mohammed (collaborative learner) said Great idea, you are right. Thank Mujib for clarifying the meaning of the verb.	Encouraging + Showing agreement
Mshari (collaborative learner) said Is it right if I write “in online learning, teachers don’t have to commute every day”	Seeking feedback
→ Mujib (collaborative learner) said Yes, you can good job	Providing feedback + Encouraging

The preceding excerpt exemplifies knowledge co-construction through dialogic interaction. Here, Mshari added a new idea to the text. Despite the fact that Mshari did not ask his friend for feedback, Mohammed engaged with Mshari’s ideas and provided feedback. Mshari demonstrated collaborative behaviour by accepting Mohammed’s feedback. In addition to agreeing and thanking his friend in the discussion mode for providing such feedback, he also edited the sentence in the text mode. However, it seemed that Mohammed was unsure about the meaning of the verb ‘commute’, and this was evident from his comment in which he asked his friend, “Do you think I am right in using commute dear friends?”. At that time, Mujib engaged in the discussion and explained the meaning of the verb commute to his friends. Mohamed expressed appreciation to Mujib for clarifying and Mshari edited the sentence based on Mujib’s interpretation of the verb commute and sought other’s feedback. Mujib encouraged Mshari and assured him of the accuracy of his editing.

### **Social interaction**

It is clear from the previous extracts that learners in groups 3 and 5 were concerned about their relationships with others when collaborating on the online joint essay. For example, learners’ collaborative discourses in Group 3, as shown in Extract 4, reflect how much they share the ownership of the joint text. That is evident not only from the frequent use of first-person plural pronouns (we), but also from exchanging some expressions to maintain group

cohesion such as “With your help we made a really good work, we all did a great job.” In addition, learners’ collaborative interaction in Group 5 in Extract 3 also showed that learners used first-person plural pronouns (we, our). Furthermore, numerous instances of learners’ social comments were observed in both groups’ discourses. Learners posted some words to praise each other’s contributions, such as “good job”, “great idea” and “excellent work”.

### Contribution to the written text

The version history in groups 3 and 5’s GD pages revealed that learners demonstrated high mutual contribution in text mode, frequently adding new ideas, expanding, and correcting each other’s existing texts while having an ongoing chat in the discussion mode. The following extracts from groups 3 and 5 GD pages explain this point:

#### Extract 6: Group 3

Google Doc interaction	Types of comments/edits
Ali (collaborative learner) wrote online learning is more budget-friendly than classroom learning.	Adding new idea
Teacher said My dear students, I would like to remind you that building on each other’s contributions will help you to improve your knowledge and produce a well-structured joint essay, so please build on Ali’s idea by adding support sentences.	Promoting writing behaviour
→ Omar (collaborative learner) wrote <u>Many people stated that online learning allowed them to save money.</u>	Extending another member’s idea.
→ Fozan (collaborative learner) wrote <u>For example, you can purchase e-book at a cheaper price than a physical one. Some of the online courses are pre-recorded, meaning that the teacher does not have to explain the topic every time; resulting paying less for such courses.</u>	Extending another member’s idea.
Fozan (collaborative learner) said I gave a couple of examples here (in paragraph one and two) but I think it may need a bit of editing. Guys I need your feedback.	Acknowledging + Seeking feedback
→ Mutawa (collaborative learner) said It is a nice paragraph. But I will make some editing	Providing feedback + Acknowledging
→ Mutawa (collaborative learner) wrote For example, <del>you</del> people can purchase <u>an</u> e-book at a cheaper price than a physical one. In addition, <del>S</del> some of the online courses are pre-recorded, meaning that the	Correcting another formal error + adding to another’s text

teacher does not have to explain the topic every time; resulting paying less for such courses. <u>As a result, these courses always coast less.</u>	
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As can be seen above, Ali introduced a new idea to initiate the paragraph. However, the teacher noticed that no one in the group attempted to expand Ali's idea by adding supporting sentences. Thus, he intervened to facilitate the co-construction of the text by encouraging students to build upon each other's ideas. In responding to the teacher's instructions, all learners contributed to the text. For example, Omar expanded on Ali's existing idea. Next, Fozan contributed in two ways: first, he contributed to the text to expand on the ideas of others. Then, he made a collaborative comment to obtain feedback from others. Mutawa joined the group and engaged critically with what had been written by Fozan. He used the discussion and text modes in a complementary manner to praise Fozan's paragraph and make some changes to his text.

In the same vein, learners in Group 5 engaged mutually with each other's contributions while writing their online joint text. Extract 7 presents an example of learners' mutuality in text mode particularly; it shows how learners edited and expanded on each other's existing texts.

#### **Extract 7:** Group 5

Google Doc interaction	Types of comments/edits
Mujib (collaborative learner) wrote  Our live are affected by technology in every way. Including the way, we learn. In the past, we did not have the ability to learn remotely. Today, both online and classroom learning are available. E-learning is considered to be more effective than classroom learning. Online learning is more convenient than in person learning since it saves time, money, and effort.	Adding new ideas
Mujib (collaborative learner) said  Good evening, everybody, I just wrote the conclusion by paraphrasing the introduction paragraph. Please have a look at and give me feedback.	Greeting + Acknowledging + Seeking feedback
Mshari (collaborative learner) wrote  <u>So, in my opinon, E-learning cannot be dispensed with in any university or school, especially with the increasing reliance on technology in education around the world.</u>	Extending another member's idea.

<p>→ Mshari (collaborative learner) said</p> <p>It is great and it covered the whole topic, excellent rewriting. I have added another sentence to give more details, and to clarify our opinion, since it is a good thing to add your opinion in the conclusion. What do you think? Any suggestion or modification?</p>	<p>Praising + Acknowledging + Clarifying + Seeking feedback</p>
<p>→ Mohammed (collaborative learner) wrote</p> <p>Our <del>live</del> lives are affected by technology in every way, <del>I</del> including the way, we learn. In the past, we did not have the ability to learn remotely. Today, both online and classroom learning are available. <u>However</u>, E-learning is considered to be more effective than classroom learning. Online learning is more convenient than in <del>person</del> <u>traditional</u> learning since it saves time, money, and effort.</p>	<p>Correcting another formal error</p>
<p>→ Mohammed (collaborative learner) said</p> <p>It is good conclusion thanx. I have done some editing</p>	<p>Praising + Thanking+ Acknowledging</p>

It can be seen from the above extract that learners in Group 5 composed their GD texts using the discussion and text modes in a complementary manner. Mujib initiated this collaborative interaction by informing his friends that he wrote the conclusion by paraphrasing the introduction. He then sought feedback on his writing. Mshari engaged positively with Mujib's text on two levels: first, he expanded on Mujib's existing text; then he posted a comment praising Mujib's writing, explained the purpose of his additions and sought the others' feedback on his writing. Mohammed, who joined the interaction later, engaged critically with what had been written by doing some editing. Similar to the other group members, Mohammed also used the discussion mode to thank his friends and inform them about his editing.

## 2. *Collaborative/passive* pattern of interaction

A qualitative analysis of students' collaboration in groups 1 and 6 in both modes of interaction revealed that three learners out of four collaborated on co-constructing the task through high mutual interaction and contribution, while one learner in each group was passive.

## Planning interaction

Students' interactions at the organising stage suggested that collaborative learners in groups 1 and 6 collectively planned their tasks and shared the responsibilities and decision-making in organising the work. However, the passive learner in each group did not engage collaboratively in planning. The following extract comes from the GD history page of these groups and illustrates how these three learners engaged in mutual interaction, while the fourth learner remained inactive.

### Extract 8: Group 1

Google Doc interaction	Types of comments/edits
Ameen (collaborative learner) said Hello guys before we start our essay, we should think about the statement? Do you agree or disagree?	Greeting + Organising the work + Eliciting
→ Basil (collaborative learner) said agree 50%, what do you think guys?	Organising the work + Eliciting
→ Ameen (collaborative learner) said Actually, I agree 100% with classroom learning I know there is a lot of advantages in online learning but, not like face to face	Showing disagreement + justifying
→ Osama (collaborative learner) said I agree with Basil 50%, because each has advantages and dis advantages.	Showing agreement + justifying
→ Ameen (collaborative learner) said Ok no problem it is good point, let's start with 50% in planning and collecting the ideas	Showing agreement + Requesting
Ameen (collaborative learner) wrote Prewriting stage collecting ideas of the topic collecting appropriate vocabulary Making an outline for the essay Introductions: Hook sentence: Background information: Thesis statement: Body 1:	Organising the work

Basil (collaborative learner) wrote in the classroom you can focus more in your study	Adding new idea
Osama (collaborative learner) wrote Save a lot of money when you study online	Adding new idea
→ Ameen (collaborative learner) said I agree with you in this point. As you know if you study out you will pay more and more for living and eating etc..	Showing agreement + justifying
Teacher said This is excellent planning. Dear students, please remember that this essay is collaborative work, so please invite your friend (Raid) to contribute and elicit his opinion on the statement before collecting the ideas.	Encouraging + promoting group cohesion
→ Basil (collaborative learner) said Sorry we did not notice that, Raid are you agree with us, please post your opinion.	Apologising + Eliciting
→ Ameen (collaborative learner) said Sorry Raid. What do you think about the statement?	Apologising + Eliciting

The above interaction occurred between the three collaborative learners and their teacher in Group 1. Ameen, who was a very active learner, started the activity by posting the first comment in which he greeted his colleagues and emphasised the importance of thinking about the extent to which they would agree with the statement of the topic. Next, Basil engaged with Ameen and posted his opinion. Although Basil suggested agreeing partly with the topic statement, Ameen showed his disagreement with Basil and suggested agreeing completely with the statement since classroom learning has more advantages than online learning. Osama joined the discussion and expressed his agreement with Basil's idea rather than Ameen's idea. He justified his agreement by suggesting that each way of learning has advantages and disadvantages.

Ameen appeared willing to collaborate, as not only did he maintain the consensus by posting a comment in which he agreed with his colleagues' proposed idea, he also invited his colleagues to collect ideas based on their proposed idea. Ameen contributed to the text and attempted to organise the process of writing by adding subheadings to the text. Basil and Osama responded to Ameen and engaged with the text by taking turns to post their ideas. The

teacher appreciated the three learners' collaboration (Ameen, Basil and Osama) and noticed that Raid had not joined the planning discussion and, as a result, he intervened to promote the learners' collaboration by praising the way in which the learners planned their essay. In addition, instead of notifying the passive learner (Raid), the teacher reminded the collaborative learners in a friendly tone that this work should be done in a collaborative way, and that it was the group members' responsibility to engage the inactive learner and elicit his opinion. Basil and Ameen responded to the teacher and apologised for not having elicited Raid's opinion. They then directed a question to Raid in which they elicited his opinion in the form of posted comments. However, these comments were not considered by Raid, and he was passive in replying to his colleagues.

**Extract 9:** Group 6

Google Doc interaction	Types of comments/edits
Abdullah (collaborative learner) said What do you think guys do we use one side or two sides? I think we should write about the two sides.	Organising the work + Eliciting
→ Amr (collaborative learner) said Good idea but I think we should collect ideas first after that we can decide later. What do you think? Is it good?	Organising the work + suggesting + Eliciting
→ Nawaf (collaborative learner) said I agree.	Showing agreement
→ Abdullah (collaborative learner) said Ok good idea.	Showing agreement +
Amr (collaborative learner) wrote collecting ideas of the topic: 1/ E-learning saves time. 2/ E-learning is more comfortable.	Organising the work + Adding new ideas
Abdullah (collaborative learner) wrote 3/Classroom learning has less distraction.	Adding new idea
Nawaf (collaborative learner) wrote 6/In online based learning it is easy to show examples such as videos and photos.	Adding new ideas

7/ it may be bad choice to learn online if the internet is weak.	
Amr (collaborative learner) wrote 4/ cheating is easy in E-learning. 5/ learning in classroom is more focused. 6/ E-learning is easier than classroom learning.	Adding new ideas
→ Abdullah (collaborative learner) said Amr, I think no one easier than another it depends on students. What do you think?	Provide feedback + Eliciting
→ Amr (collaborative learner) said Abdullah, my point here is online class is easier than classroom because you can join the class anywhere while learning in classroom you have to go to college. So now my friends the ideas are enough, I think both have pros and cons so, we should write about both of sides. What do you think?	Apologising + Prising + Clarifying + suggesting + Eliciting
→ Abdullah (collaborative learner) said Thank you for your clarifying your point. I agree with you Amr let's start writing about both ways.	Thanking + Showing agreement
→ Nawaf (collaborative learner) said Ok let start writing the hook sentence.	Showing agreement

As shown in the excerpt above, three of the four students in Group 6 (Amr, Abdullah and Nawaf) engaged in planning discussion mutually. All three students decided to collect ideas before deciding how much they agreed with the topic statement. This decision was based on Amr's posted comment, in which he suggested that gathering ideas about both methods of learning (online and classroom learning) would help them reach an agreement on decision-making. All three learners contributed to the text by posting their ideas. As the students collected ideas, Abdullah requested clarification on Amr's written idea; Amr posted a comment to clarify his point to Abdullah, and then he suggested covering both online and classroom learning, as each has advantages and disadvantages. The other two collaborative members (Abdullah and Nawaf) agreed with Amr's suggestion. On the other hand, the fourth member of the group (Ibrahim) appeared to be passive and did not participate in the planning stage.



## Cognitive interaction

The qualitative analyses of cognitive interaction in these two groups (1 and 6) revealed that the same three learners in each group were active in responding to each other's initiation. They frequently seek and provide feedback, as well as elicit and elaborate on their own and others' ideas. While the passive learners in each group remained inactive, contributing very little to the text. The extracts below show how correct sentence structure and grammar are achieved through a dialogic process of mutual assistance from collaborative learners. These extracts also demonstrate how and when passive students provide feedback.

### Extract 10: Group 1

Google Doc interaction	Types of comments/edits
Ameen (collaborative learner) wrote  Studying in the Classroom is traditional and famous way of learning. There are many advantages of taking classes inside the classroom.	Adding new idea
Ameen (collaborative learner) said  What do you think about the topic sentences of the first paragraph, please tell me your opinion. I think it need more information, example maybe.	Eliciting + Elaborating
→ Osama (collaborative learner) said  Excellent 😊, yes, I agree it need example, I will do Ameen.	Praising + Showing agreement +Acknowledging
Osama (collaborative learner) said  <u>For example, studying in the classroom is the best way to get more focusing with teachers.</u>	Extending another member's idea.
→ Ameen (collaborative learner) said  I think it is better grammatically to write "to focus" instead of "to get more focusing". What do you think my dear friends?	suggesting + Eliciting
→ Basil (collaborative learner) said  what about if we say (to get more attention).	suggesting
→ Ameen (collaborative learner) said  Wow it is a nice word from a nice guy. I will edit the sentence using your word and give me your opinions?	Praising + Encouraging + Acknowledging + Eliciting

Ameen (collaborative learner) wrote For example, studying in the classroom <del>is the best way</del> <u>allows learners to get more focusing with teacher</u> pay more attention to teachers and to get more feedback from them.	Correcting + Extending another member's idea.
→ Osama (collaborative learner) said It is great editing. Thank you, my great friends.	Praising + Thanking
→ Basil (collaborative learner) said It became a good sentence.	Praising

The interaction in the extract above occurred between the three collaborative learners in Group 1. It was initiated by Ameen when he elicited others' opinions about his newly added idea. Ameen's initiation was reciprocated by Osama, who praised his contribution and expressed his willingness to expand on the existing idea. Ameen then read what Osama had written critically and commented on the verb phrase used in the sentence; suggesting that writing "to focus" is more grammatically correct than writing "to get more focusing". Ameen's remark prompted Basil to look for an appropriate word (attention). In the following comment, Ameen praised Basil's choice of words and stated that he would edit the sentence using Basil's word. Inspired by Basil's assistance, Ameen restructured the sentence in text mode. Following this, Osama and Basil praised Ameen's editing by leaving encouraging comments, whereas the fourth member of the group (Raid) remained inactive and did not take part in the discussion with his friends.

#### Extract 11: Group 6

Google Doc interaction	Types of comments/edits
Abdullah (collaborative learner) wrote <u>For example, during the pandemic last year all exams in online. Many learners get high marks and pass the exams easily.</u>	Extending another member's idea.
Abdullah (collaborative learner) said Please my friends what do you think about the support sentence? any feedback?	Eliciting
→ Teacher said Thank you, my dear student Abdullah for your participation it is a good example,	Thanking + Encouraging + Expressing emotion + Promoting giving

<p>however, there were some grammatical mistakes.</p> <p>Please, my dear students, can you engage with your friend's text and discuss these grammar mistakes?</p> <p>Ibrahim, I'm sure that you are a good student and you are able to provide help for your friend. Amr, we miss you this morning, can you provide feedback for your friend.</p>	language-related feedback.
<p>→ Ibrahim (passive learner) wrote</p> <p>For example, during the pandemic last year all exams in online. Many learners got <del>get</del> high marks and pass the exams easily.</p>	Correcting another formal error
<p>→ Nawaf (collaborative learner) said</p> <p>Good example, but we should use the Connectors words in our book that teacher explained to us last lecture to join theses sentences such as 'therefore'. Because we are talking about something in the past, we should write the verbs in the past form (e.g. pass).</p>	Providing feedback + Showing agreement + Justifying
<p>→ Amr (collaborative learner) said</p> <p>Thank you doctor I miss you too. hi guys sorry for not joining you this morning. Any way we will do our best this evening in order to finish this paragraph. Abdullah, you have added a good example. I also agree with your editing my friends. But the main sentence is about cheating in online exam however, the example did not show that. I will edit and give me your opinion.</p>	Thanking + Apologising + Encouraging + Showing agreement + providing feedback + Acknowledging + Eliciting
<p>Amr (collaborative learner) wrote</p> <p>For example, during the pandemic last year all exams <del>in</del> <u>were conducted</u> online. <u>Therefore</u>, many learners got high marks and <del>pass</del> <u>passed</u> the exam easily <u>because they had opportunity to cheat</u>.</p>	Correcting another formal error + adding on another's existing ideas
<p>→ Abdullah (collaborative learner) said</p> <p>I like your adding Amar it links the example to the main sentence, but why you change 'in' to 'were'. Also, are you sure about 'passed'</p>	Provide feedback + Questioning
<p>→ Nawaf (collaborative learner) said</p> <p>Yes dear, we are sure about 'passed' this is the past tens of 'pass'</p>	Providing feedback
<p>→ Amr (collaborative learner) said</p> <p>Yes, as Nawaf said it is the past tens of pass. I changed 'in' to 'were' because 'in' is not verb and the sentence needs verb</p>	Showing agreement + justifying
<p>→ Abdullah (collaborative learner) said</p> <p>Ok, nice editing, thanx</p>	Showing agreement + Praising + Thanking

Extract 11 suggests that when the teacher intervened and drew learners' attention to what others had written, the three learners (Nawaf, Amr and Abdullah) in Group 6 engaged in reciprocal interaction. It was clear that after Abdullah extended the existing text by adding example, the teacher posted comment in which he promoted the mutual cognitive interaction and encouraged students to engage with Abdullah's contribution. Ibrahim, who adopted a

passive role, was the first learner who offered language-related feedback as a form of editing behaviour; however, unlike the other group members, he seemed to only contribute as a response to the teacher's notification. His editing demonstrated a lack of collaboration because he did not appreciate the contributions of others, as he modified the verb without having an online debate to justify or clarify it. In contrast, the other three learners (Nawaf, Amr and Abdullah) engaged collaboratively to deliberate about the grammatical accuracy of Abdullah's text.

Through the exchange of collaborative behaviours such as providing feedback, raising questions and showing agreement, learners resolved several language-related issues. For instance, Nawaf made a comment emphasising the use of connector words, in which he referenced the textbook and the teacher's directions to justify his emphasis. In addition, he highlighted using the past tense for all verbs when writing about the past. Amr then left a comment indicating that he was an interactive learner. He thanked his teacher, apologised to his colleagues for missing the morning lecture and encouraged his group members to participate, as well as agreed with his colleagues' editing and provided feedback on the content. After that, he edited the text based on what he and Nawaf had suggested in their posted comments. Abdullah then engaged in the discussion and showed his acceptance of adding some words to his text by reporting that this added link the sentence to the previous one; however, he questioned using the verb 'were' instead of 'in' and showed his uncertainty about the form of the verb 'passed'. Instead of imposing their ideas, Nawaf confirmed to Abdullah that 'passed' is the past tense of the verb 'pass'. Amr also explained that the addition of the verb 'were' was required because the sentence lacked a verb. Abdullah accepted the resolution because he understood its rationale.

## **Social interaction**

Analysing the learners' social talk in these two groups (1 and 6) provided evidence that the three collaborative learners in each group mutually reciprocated many social comments, as opposed to the passive learners. For example, collaborative learners in Group 1 (Ameen, Basil and Osama) used words of encouragement to enhance their relationship. It can be clearly seen in Extract 10 that some encouragement and emotional expressions such as "nice word from a nice guy", "it is great editing" and "my great friends". Similarly, the collaborative discourses of Amr, Nawaf and Abdullah in Group 6 also witnessed similar expressions, as shown in Extract 11 (e.g., "nice editing", "sorry for not joining you this morning", "I like your adding"). Furthermore, the predominance of the first-person plural pronoun 'we' in the learners' discussion that distinguished their collaborative work was clear from the previous extracts. In addition, some expressions were found in learners' discourses indicated joint ownership and shared responsibility towards task completion, such as "our essay" in Extract 8 of Group 1 and "we will do our best to finish this paragraph" in Extract 11 of Group 6.

## **Contribution to the written text**

Analysing learners' collaborative behaviours in text mode also revealed that the three collaborative learners in group 1 and group 6 co-constructed the GD essay collaboratively. Regarding the passive learners' contributions to the text, each learner behaved differently. Raid in Group 1 adopted the *free rider* role and relied on other members. While Ibrahim in Group 6 contributed fairly to the text, he did so without discussion and always in accordance with the teacher's notification. The following extracts illustrate how groups 1 and 6 co-constructed the GD joint essay, and how they engaged with each other's contributions.

### Extract 12: Group 1

Google Doc interaction	Types of comments/edits
<p>Teacher said</p> <p>Hello, my dear students, I noticed that Ameen was the only student who started writing the second paragraph. Thank you, Ameen, for your active participation. However, it is important to invite your friends to complete your writing. Please, every student should extend the text by adding a support sentence, another new one, or editing the other's sentence. I want you to discuss and build the text collaboratively, as you did in the introduction and first paragraph. You did very well. Keep going.</p>	<p>Greeting + Thanking + promoting writing behaviour+ promoting group cohesion + encouraging</p>
<p>→ Basil (collaborative learner) said</p> <p>Ok teacher we will do</p>	<p>Showing agreement + Acknowledging</p>
<p>Osama (collaborative learner) wrote</p> <p>In addition, online learning is extremely flexible.</p>	<p>Adding new idea</p>
<p>Osama (collaborative learner) said</p> <p>I need someone to complete this sentence. it needs support sentence. please help</p>	<p>Requesting + Elaborating</p>
<p>→ Basil (collaborative learner) wrote</p> <p><u>For instance, we can record the session and watch it any time we want.</u></p>	<p>Extending another member's idea.</p>
<p>→ Ameen (collaborative learner) said</p> <p>Wow it is good example Basil</p>	<p>Praising</p>
<p>Osama (collaborative learner) wrote</p> <p>there are problem in online classes for example, weak internet and brok the microphone.</p>	<p>Adding new idea</p>
<p>→ Ameen (collaborative learner) said</p> <p>What do you mean Osama by brok? if the meaning (damage) the spilling is wrong, I will edit the sentence.</p>	<p>Questioning + providing feedback + Acknowledging</p>
<p>Ameen (collaborative learner) wrote</p> <p><u>In contrast, there are problems in online classes for example, such as weak slow internet connections and brok the broken microphone. For example, last survey showed that 80% of learners faced difficulties during online learning.</u></p>	<p>Correcting another formal error + Extending another member's idea.</p>
<p>→ Basil (collaborative learner) said</p> <p>If you say 'faced difficulties with internet' it will be better.</p>	<p>providing feedback</p>
<p>→ Ameen (collaborative learner) said</p> <p>you are right. Thanx</p>	<p>Showing agreement</p>

According the teacher's posted comment in Extract 12, Ameen was the only one who engaged in the process of writing the second paragraph. Therefore, the teacher intervened and played an important role in promoting collaborative writing behaviours. He directed the

students to discuss and build on what others had written. He also encouraged students by appreciating the group's effort and asked them to complete their work collaboratively as they did before. After that, the three collaborative learners (Osama, Basil and Ameen) built the text by not only adding new ideas but also, by engaging in each other contributions. Learners also used the discussion and text modes in a complementary manner to elaborate on their own ideas, raise requests and questions, praise other's contribution, expand on existing ideas, and correct existing ideas. However, the passive learner (Raid) relied on others and did nothing to complete the text.

**Extract 13:** Group 6

Google Doc interaction	Types of comments/edits
Abdullah (collaborative learner) wrote New applications and programs to support the online study here is some examples: blackboard or zoom. Teams' programs service the same function and they all help us to study.	Adding new ideas
Abdullah (collaborative learner) said Any feedback my friends?	Seeking feedback
Teacher said Hello dears, I noticed that you are only two today, no problem collaborate with each other. I'm sure that you will do great job. Thanx Abdullah for your participation. Ibrahim join your friend pleas.	Greeting + promoting collaboration + Tanking + requesting
→ Ibrahim (passive learner) wrote <u>Some students find difficult to use blackboard because they have weak net. In contrast, others is like it because they have fast net.</u>	Extending another member's idea.
→ Abdullah (collaborative learner) said Good Ibrahim, I think we should add "however" in your sentence. what do you think?	Providing feedback + Eliciting
Abdullah (collaborative learner) said Ok my friends give me your feedback whenever you feel free.	Seeking feedback
→ Amr (collaborative learner) said Thank you for all great work. Please see my editing.	Acknowledging + Thanking +
Amr (collaborative learner) wrote New applications and programs to <del>support</del> <u>facilitate</u> the online study <del>here is some examples: such as</del> blackboard, or zoom. <del>T and teams.</del> All these programs service the same function and <u>they all</u> help us to study <u>during this pandemic.</u>	Correcting another formal error

→ Nawaf (collaborative learner) said Good job guys, I have edited and added on what you have written	Encouraging + acknowledging
Nawaf (collaborative learner) wrote <u>However, some students find difficult to use blackboard-these programs because they have weak net. In contrast, While others is like it because they have fast net. Moreover, online learning is convenient and saves time. For example, many teachers feel comfortable teaching remotely.</u>	Correcting another formal error + adding new idea.
Amr (collaborative learner) wrote <u>Likewise, learners have chance to work and study because they have extra time</u>	Extending another member's idea.
→ Abdullah (collaborative learner) said Nice editing and adding my friends, thanx	Thanking + praising

It is clear from the above extract that Abdullah, one of the collaborative students, worked alone during the class time since the other collaborative learners (Amr and Nawaf) were absent. Therefore, the teacher intervened to promote the learners' collaboration and encourage Ibrahim (novice learner) to participate. Despite Abdullah seeking Ibrahim's feedback on his work, Ibrahim ignored him and expanded on Abdullah's ideas only after being notified by the teacher. Abdullah behaved collaboratively with Ibrahim's contribution by providing feedback in the form of posted comments, while Ibrahim did not respond to Abdullah's comment and remained silent. Abdullah posted another comment to seek feedback from his absent colleagues. Amr and Nawaf joined the discussion later and posted comments whereby they encouraged their colleagues, thank them, and informed them about what they had edited and written. Both Amr and Nawaf exhibited many collaborative writing behaviours in the text mode. They not only corrected formal errors but also added a new idea and expanded on each other's contributions. Abdullah posted comments to thank his friends for their editing and adding.

### 3. *Expert/novice pattern of interaction*

The qualitative analysis of learners' posted comments and revision behaviour in groups 2 and 4 explained how learners adopted the role of experts, took responsibility for the task, and



encouraged the other novice learners to participate in the task. Thus, the level of mutuality in their interaction was moderate.

### Planning interaction

The learners' interaction at the organising stage of groups 2 and 4 revealed that learners acting as experts played an essential role in ensuring the joint contribution and often helped the novices' learners engage in a decision-making process. The following extracts (14 and 15) from the GD history page of these groups illustrate how the experts involved the novices in making the decision.

#### Extract 14: Group 2

Google Doc interaction	Types of comments/edits
Bader (expert learner) said Hi every one, before we start, I suggest that we choose the same side to agree about. What do you think? Please my dear friends express your opinions.	Initiating the activity + Greeting + Organising the work+ Suggesting+ Eliciting
→ Asim (expert learner) said I prefer learning in classroom.	Providing feedback
→ Salah (expert learner) said Yes, I also prefer learning in classroom.	Showing agreement
Salah (expert learner) said Please Abdurrahman and Sayer join us, do you agree or disagree?	Requesting + eliciting
→ Abdurrahman (novice learner) said Disagree means we study in classroom, right? Not online.	Questioning
→ Bader (expert learner) said Abdurrahman it means that we prefer classroom learning.	Providing feedback
→ Abdurrahman (novice learner) said Ok I disagree	Showing agreement
Asim (expert learner) said So, let start collecting our ideas	Organising the work + Requesting
→ Bader (expert learner) said We can't start collecting ideas Asim until Sayer share us his opinion. Please Sayer what do think?	+ Organising the work + Eliciting

<p>→ Asim (expert learner) said</p> <p>Oh, sorry I thought Sayer mentioned his opinion. Are you agree with us Sayer?</p>	Apologising + Eliciting
<p>→ Sayer (novice learner) said</p> <p>Sorry I wasn't paying attention. I agree with you</p> <p>Yes, I think we should write about disagree.</p>	Apologising + Showing agreement
<p>→ Bader (expert learner) said</p> <p>Thank you for you all, so now we all agree that classroom classes are better. Let make the outlines.</p>	Organising the work + Thanking + Requesting

Bader, the most active learner in Group 2, who was one of the experts in the group led the group during the planning stage, as seen in Extract 14. He started the activity by greeting his friends, making suggestions, and eliciting others' opinions. Bader's comment made it clear that he did not want to impose his opinion on his friends, but rather sought consensus on how to organise the online activity. Asim, another expert learner in this group, responded to his post by stating that he preferred classroom learning over online learning. Then the third expert learner (Salah) engaged in the discussion and expressed his agreement with Asim; he then directed a request to the novice learners (Abdurrahman and Sayer), encouraging them to participate in the discussion and express their opinions. A language barrier prevented Abdurrahman from knowing whether disagreeing with the statement meant preferring classroom learning. After Bader clarified Abdurrahman's doubts, Abdurrahman was able to express his opinion. Then, Asim asked his friends to propose ideas because he assumed that everyone in the group had shown their opinion. Bader intervened to regulate the activity and involve all members in decision-making. Therefore, he communicated to Asim that they could not begin the idea-collection process until Sayer (another novice learner) participated in the decision-making process. Meanwhile, he asked Sayer for his view in a polite manner. Asim apologised and stated that he had assumed Sayer had already agreed. Sayer participated in the discussion by posting a comment apologising for the delay in expressing his opinion

and indicating his agreement with the other group members. Having reached a consensus, Bader posted a comment thanking all members and encouraging them to brainstorm.

**Extract 15:** Group 4

Google Doc interaction	Types of comments/edits
Ajlan (expert learner) said Hi every one, first of all, guys what are you say about the topic statement? I agree with it	Initiating the writing activity + Greeting + Organising the work + Eliciting
→ Firas (novice learner) said They both have advantages and dis advantages.	Organising the task
→ Rseeny (novice learner) said What about traditional classes	Organising the task
Harbi (expert learner) said Hi my friends it is necessary to agree in one side because we will write one essay.	Greeting + Organising the task
→ Ajlan (expert learner) said I agree with Harbi, but I suggest agreeing partly, writing about the pro and cons will give us more ideas. What do you think?	Showing agreement + Suggesting + Justifying + Eliciting
→ Harbi (expert learner) said Ok Ajlan I agree	Showing agreement
→ Rseeny (novice learner) said Ok no problem, I agree	Showing agreement
Firas (novice learner) said So, agree or dis. is it both?	Questioning
→ Ajlan (expert learner) said We agree with you, so we will go with both sides. Now let's start to collect the ideas.	Clarifying + Requesting

In a similar manner, experts (Ajlan and Harbi) in Group 4 controlled the planning stage; however, they involved novice learners (Firas and Rseeny) in the decision-making. As demonstrated in Extract 15, instead of imposing his opinion, Ajlan initiated the activity by greeting his colleagues, asking them about their views on the statement, and expressing his opinion. In the reply to Ajlan, Firas and Rseeny posted their opinions; however, their opinions were not only different to each other but also opposed to Ajlan's opinion. Therefore,

Harbi (expert learner) intervened to guide the group in organising the work. He advised his colleagues to reach a joint consent since they will write a joint essay. The other expert learner (Ajlan) agreed with Harbi and suggested that they choose to agree partly with the statement since they would be able to collect more ideas. In response to Ajlan, Harbi and Rseeny posted comments to show their agreement; whereas Firas sought clarification on the meaning of “agreeing partly”. The situation of Firas was similar to that of the novice learner in Group 2 in Extract 14 when he sought clarification on the meaning of “disagreeing”. This suggested that the low language proficiency of novice learners often led to misunderstandings. However, the novices did not hesitate to request such clarification because they assumed that assistance was available in this relationship. In the following comment, Ajlan assisted Firas by giving an explanation and then invited all students to collect ideas.

### **Cognitive interaction**

In these groups, experts and novices engaged in cognitive interaction when learners assuming the role of expert encouraged novices to participate in the discussion through guided questions, directed requests and even overt agreement. The following extracts (16 and 17) from these groups’ GD history pages explain this point.

#### **Extract 16: Group 2**

<b>Google Doc interaction</b>	<b>Types of comments/edits</b>
Abdurrahman (novice learner) wrote You can make a number of many relationships while you learning in class.	Added new idea
→ Bader (expert learner) said Dear with present continuous we have to use verb (is or are). So, it should be you are learning	Providing feedback
→ Sayer (novice learner) said Bader is it ok to say while you learn	Questioning
→ Bader (expert learner) said Good Sayer yes, you corrected it in another way	Providing feedback

Asim (expert learner) said Dear Abdurrahman should we say ‘a number of’ with ‘many’?	Questioning
→ Abdurrahman (novice learner) said Yes Asim, what do you think?	Eliciting
→ Asim said (novice learner) said I just reminded you, is it ok to use these words together?	Questioning
→ Salah (expert learner) said Abdurrahman You can write ‘many’ or ‘a number’ only	Providing feedback
→ Abdurrahman (novice learner) said You mean ‘many’ enough, I agree. Thank you, my friends, your feedback is great.	Showing agreement + Thanking
→ Asim (expert learner) said We all learn from each other and that’s why we are working together as doctor always said. Thank you everyone.	Expressing emotion + Thanking

According to the extract above, Abdurrahman contributed to the text by adding a new idea. Afterward, experts (Bader, Asim and Salah) supported the novice students (Abdurrahman and Sayer) in reaching solutions in various ways. First, Bader provided language feedback on Abdurrahman’s formal error. By highlighting the mistake, Bader prompted Sayer to resolve formal errors in a different manner. Even though Sayer provided the correct answer, he asked Bader to confirm it. Sayer’s participation was welcomed and praised by Bader. Then, rather than providing the answer explicitly, Asim critically questioned Abdurrahman about the possibility of using the words “a number of” with “many” together. Asim’s assistance is known as proleptic feedback, whereby the expert provides signs to stimulate the answer from the novice. Although Abdurrahman answered Asim, he seemed uncertain about his answer, and this was evident from his attempts to elicit Asim’s opinion. Asim again reformulated his guided question to Abdurrahman. At that time, Salah intervened to explain the feedback to Abdurrahman. Asim’s guided questions and Salah’s supported explanation helped Abdurrahman achieve success in noticing his language-related mistake and in reaching a resolution. This was obvious from his posted comments, whereby he confirmed the answer, showed his agreement and valued his colleagues’ feedback. Asim replied to Abdurrahman in

a humble tone and admitted that during this activity, all group members have learned from each other and that this was the purpose behind working collaboratively, as their teacher told them.

**Extract 17: Group 4**

Google Doc interaction	Types of comments/edits
Ajlan (expert learner) wrote Some people prefer traditional classes because they can understand better. For example, binge in classroom allows you to contact physically with your teacher and forces you to pay more attention with him all the time.	Adding new idea
→ Harbi (expert learner) said I think my dear classmates you want to write being not binge. Also, you should write (to him) not (with him)	Providing feedback
→ Ajlan (expert learner) wrote I agree with you dear classmate	Showing agreement
Ajlan (expert learner) said Pleas Firas or Rseeny, can you complete my writing.	Expressing emotion + Requesting
→ Rseeny (novice learner) wrote On the other hand, online classes are easy to be affected by.....	Adding new idea
Rseeny (novice learner) said How can we say (مشاكل الانترنت)	Requesting
→ Firas (novice learner) said What about 'network issues' my friends	Adding new idea
→ Ajlan (expert learner) said It's a good effort my dears.	Encouraging
→ Harbi (expert learner) said I agree it is good phrase. Thank you all.	Encouraging + Thanking

According to the extract above, learners in Group 4 engaged in cognitive interaction to discuss grammar accuracy and vocabulary choice. Ajlan added new ideas to the joint text, while Harbi criticised Ajlan's writing and provided language-related feedback. Harbi's comment was accepted by Ajlan, as evidenced by his posted comment, in which he agreed with Harbi's feedback. In addition, the extract indicates that the experts (Ajlan and Harbi)

encouraged the novices (Rsseny and Firas) to contribute to the task via request, encouragement and overt agreement. Ajlan then asked Rsseny and Firas to contribute to and complete his writing. Rsseny responded to Ajlan by adding a new idea to the text; however, language barriers prevented him from completing the sentence, so he sought vocabulary-related feedback in his mother tongue (Arabic). Firas assisted Rsseny and completed the sentence by suggesting the appropriate phrase “network issues.” Ajlan and Harbi contributed to the discussion to show an agreement via encouraging, praise and appreciation of the novices’ efforts.

### **Social interaction**

Learners in groups 2 and 4 engaged in social interaction in which the experts frequently used supportive words to promote the contributions of novices. For example, in Extract 17, experts posted “It’s a good effort, my dears” and “It is a good phrase” to encourage the novices’ contribution. Likewise, novices often appreciate experts’ assistance. For instance, in Extract 16, the novice expressed gratitude to the experts for their assistance: “Thank you, my friends, your feedback is great.” In the same extract, an expert posted a comment in reply to the novice that reflected the extent to which experts wanted to build a joined relationship between them, such as “We all learn from each other and that’s why we are working together as the doctor always said, Thank you, everyone.” Furthermore, some expressions were found in learners’ interactions indicated joint ownership of the text (e.g., in Extract 14: “Let’s start collecting our ideas” and in Extract 15 “We will write one essay”).

### **Contribution to the written text**

Learners demonstrating *expert/novice* patterns exhibited moderate levels of mutuality in their contribution to the text mode. Experts often contributed more to the task, not only to control

the task but also to encourage novices to participate. The following extracts illustrate how experts involve the novices in the writing process.

**Extract 18:** Group 2

Google Doc interaction	Types of comments/edits
Bader (expert learner) wrote Going to class every day gives purpose to your life, feeling like you accomplished something in your day would affect you positively.	Adding new idea
Salah (expert learner) wrote <u>For instance, when learners practice what they have learned with their friends inside the class would help them to improve their learning.</u>	Extending another member's idea.
Asim (expert learner) wrote For instance, when learners practice what they have learned with their friends inside the class, <del>would help them to</del> <u>they could</u> improve their learning <u>skills as well as their social skills.</u>	Adding to another's existing text + Correcting another formal error
Bader (expert learner) said Pleas Sayer and Abdurrahman add something to the second paragraph. You are good students we need your great ideas.	Requesting + Encouraging
→ Sayer (novice learner) wrote There are feedback in classroom studying and learner can interact with teacher all the time.	Adding new idea
Sayer (novice learner) said what do you think about my idea?	Seeking feedback
→ Salah (expert learner) said The idea is excellent but need some editing. Abdurrahman edit it please.	Providing feedback
→ Abdurrahman (novice learner) wrote There <del>are</del> <u>is</u> feedback in classroom studying and learners can interact with teacher all the time	Correcting another formal error
→ Bader (expert learner) said Good job my friends.	Encouraging

As shown in Extract above, the experts (Bader, Salah and Asim) controlled the task; however, they encouraged the novices to contribute to the online joint text. They started the second paragraph by adding their ideas to the GD page in parallel. Despite the presence of the teacher, Bader did not hesitate to act as a tutor to promote the novices' participation in the form of posted comments. Not only did he ask them to contribute to the text, he also raised



their confidence by valuing their ideas (“we need your great idea”). In responding to Bader, Sayer contributed to the task by using the two modes of interaction in a complementary manner. He added a new idea to the GD text and posted comments to seek his colleagues’ feedback. Group members reacted to Sayer’s contribution collaboratively. Salah praised Sayer’s idea but suggested that it be edited. As a result, he requested that Abdurrahman revise it. It seemed that Salah intended to involve the other novice learner (Abdurrahman) by directing an edit request to him instead of revising the text himself. In response to Salah’s request, Abdurrahman corrected the formal error in Sayer’s written ideas. Bader then contributed to promoting collaboration by appreciating his colleagues’ efforts.

**Extract 19:** Group 4

Google Doc interaction	Types of comments/edits
Ajlan (expert learner) wrote Some people prefer online classes over traditional classes for some reasons. The best thing about online learning is that learners can study from the home.	Adding new idea
Harbi (expert learner) wrote Some people prefer online classes over traditional classes for some reasons. <u>For example, E-learning is more comfortable and restful.</u> The best thing about online learning is that learners can <u>study take online courses</u> from the <u>comfort of their homes or offices.</u>	Adding to another existing idea + Correcting another formal error
Ajlan (expert learner) said Please dears everyone should add something, we should all build the text.	Requesting
→ Firas (novice learner) wrote online learning is teach you how to manage your time.	Adding new idea
→ Harbi (expert learner) said The idea is good, but I realise a mistake. Rseeny could you find the mistake	Encouraging + giving feedback
→ Rseeny (novice learner) said It’s grammatically wrong to say ‘is teach’ we need to say ‘teaches’	Providing feedback
→ Ajlan (expert learner) said Good Rseeny fix it	Encouraging + Requesting
→ Rseeny (novice learner) wrote <u>Moreover,</u> online learning <u>is teaches</u> you how to manage your time.	Correcting another formal error

As in the case of Group 2, experts in Group 4 also took responsibility for controlling the task; however, they engaged the novices in the task by encouraging and guiding them. In the above extract, expert learner (Ajlan) contributed to the text mode and added a new idea to the first paragraph. Harbi engaged with Ajlan's existing idea by adding and making necessary corrections. After that, Ajlan played the role of tutor and posted comments in which he promoted group cohesion. He asked the novices to contribute to the text indirectly by emphasising the importance of joint text creation. In response to Ajlan's request, the novice (Firas) participated in the task by adding a new idea. In the following comment, Harbi acted as a teacher by praising Firas's idea, suggesting that Firas's writing contained an error, and asking Rseeny to find it. Rseeny then posted a comment in which he correctly identified Firas's error. Then, Ajlan left a comment indicating his intention to promote the novices' writing behaviours. He requested that Rseeny contribute to the text and correct the grammatical error in Firas's sentence. Rseeny demonstrated collaborative behaviour when he responded to Ajlan's request and edited the sentence.

### **Mutuality in the control condition (GMCW without teacher intervention)**

The level of mutuality in this condition was low. All groups demonstrated a *cooperative/passive* pattern where some learners cooperated to produce the GD essay while others remained passive.

#### **1. *Cooperative/passive* pattern of interaction**

A qualitative analysis of learners' extracts from this pattern revealed that all small groups lacked mutual discussion. In the discussion mode, students were unwilling to comment on or engage with another's contributions. The following examples illustrate their low level of mutuality while completing the task.

## Planning interaction

None of the small groups in the control condition engaged in planning discussion. The following extract comes from the GD history pages of these groups and illustrates how learners started their writing. In Group 1, learners exhibited a low level of mutuality during the planning stage. There was one cooperative student who attempted to organise the task; however, his initiative was not reciprocated by others. The next extract provides evidence of that.

### Extract 20: Group 1

Google Doc interaction	Types of comments/edits
Hagie (cooperative learner) said Hello guys let start.	Greeting + Organising the task
Hagie (cooperative learner) said Let start organising the task	Organising the task

Hagei posted two comments in Extract 20 encouraging his colleagues to begin to organise their writing. However, no one engaged in planning discussions with him. Similarly, only three students worked together in Group 2 to plan their GD essay, but they limited their brainstorming by contributing to the text mode rather than a discussion. During this time, the fourth member of the group remained passive.

### Extract 21: Group 2

Google Doc interaction	Types of comments/edits
Khaled (cooperative learner) wrote planning discussing about online learning	Organising the task
Salman (cooperative learner) wrote collecting ideas of the topic collecting appropriate vocabulary Brainstorming	Organising the task

Think loudly about the topic Discuss with your colleagues you must discuss the topic with your friends	
Khaled (cooperative learner) wrote _saving time _more convenient	Adding new ideas
Jihad (cooperative learner) wrote _no need to wear mask _save money	Adding new ideas

The above extract from the GD history page of Group 2 suggests that Khaled initiated the activity; however, he displayed non-collaborative behaviour. Instead of engaging in group decision-making, he imposed his opinion and decided to agree with the topic statement, as he wrote “discussing about online learning”. His initiation was followed by Salman’s contribution, in which he completed the subheadings of the planning stage. Although both Khaled and Salman were aware of the importance of planning discussion as evidenced by their written instructions in the extract above (e.g., “Think loudly about the topic”, “discuss with your colleagues” and “you must discuss the topic with your friends”), a closer examination of their GD comment history page contradicted this since there was no evidence of planning. Students only contributed to the text mode after writing the subheadings by taking turns posting their ideas for the topic. The other learner (Fahad) remained silent and did not participate in the idea-collection process.

Likewise, Group 3 did not engage in planning discussion. Two learners played a cooperative role posted few planning comments during the writing of the GD essay. However, these comments indicated non-collaborative planning. The following extract illustrates this point.

**Extract 22:** Group 3

Google Doc interaction	Types of comments/edits
Almaee (cooperative learner) said	Organising the task +

What we should write about in body 2?	Eliciting
→ Abdallah (cooperative learner) said Traditional learning in body 2	Organising the task + suggestion
→ Almaee (cooperative learner) said No, you are wrong, we should discuss the issues that we have during online courses. Because if we bring traditional learning it will be a comparative essay.	Showing disagreement + justifying

As shown in the above extract, Almaee appeared unsure of what to write in the second paragraph. As a result, he posted comments in which he attempted to elicit other members' opinions. In response to Almaee, Abdallah suggested writing about traditional learning; however, Almaee rejected his suggestion. Despite Almaee's justification for his rejection and his use of the first-person plural pronoun (we), he seemed to exert his authority by saying harshly, "No, you are wrong". His comment reflected an authoritative tone and impolite behaviour.

Extract 23 indicates that there was no mutual planning discussion in Group 4. As in Group 1, one learner (Bachir) initiated the planning discussion. However, no one else in the group has responded to his initiative.

**Extract 23:** Group 4

Google Doc interaction	Types of comments/edits
Bachir (cooperative learner) said Hi guys, I think we have to collect ideas and write an introduction before start.	Greeting + Organising the task

In the same vein, Group 5 had a low level of mutual planning discussion. A closer examination of the learners' comments history page revealed that the two cooperative learners agreed not to plan tasks. The remaining three students did not participate in the planning decision-making process. The following extract exemplifies this point.

**Extract 24: Group 5**

Google Doc interaction	Types of comments/edits
Rasheed (cooperative learner) said Where is the pre-writing stage?	Organising the task
Rasheed (cooperative learner) said Or, do you think we should start writing	Organising the task
→ Misbah (cooperative learner) said No need. I think we should write	Organising the task
→ Rasheed (cooperative learner) said Ok	Showing agreement

The above interaction took place between two learners in Group 5. Rasheed questioned whether they should conduct a pre-writing stage or simply begin writing. In response to Rasheed, Misbah suggested writing the essay without getting involved in the brainstorming stage. Rasheed agreed with his colleague's recommendation.

**Cognitive interaction**

Analysing learners' cognitive interaction in all groups in the control condition revealed that the students did not engage in collaborative dialogue and did not discuss content and language knowledge. The following extracts include all cognitive comments that have been found on the GD comment history pages of these groups.

During the writing of the essay, Group 1 was passive in the discussion mode; no ideas were shared, no feedback was sought and no opinions were solicited. As previously stated, two students in this group (Hagie and Turki) cooperated by taking on the roles of writer and editor. Neither the author nor the editor used discussion mode to ask for feedback or explain why they made the choices they did when editing.

In Group 2, the cooperative learners worked on their individual sections without engaging in cognitive or mutual interaction. An examination of their comments' history page revealed

that Khaled posted the only cognitive comment, which was addressed to Jihad. The following extract shows this comment.

**Extract 25:** Group 2

Google Doc interaction	Types of comments/edits
Khaled (cooperative learner) said Jihad you should mention the other opinion in your conclusion.	Elaborating

In the above extract, Khaled comments on Jihad's section (the conclusion) by providing content feedback. However, Jihad showed no willingness to consider his suggestion, neither in discussion nor in text mode. In Group 3, learners also failed to exchange cognitive comments, except on one occasion. However, these comments demonstrate a low level of mutuality as well.

**Extract 26:** Group 3

Google Doc interaction	Types of comments/edits
Abdallah (cooperative learner) wrote The world fought the pandemic through learning online.	Adding new idea
→ Almaee (cooperative learner) said you shouldn't talk about the pandemic in your part because we are talking that it can be a good alternative, not because we have to.	Providing feedback
→ Abdallah (cooperative learner) said Yes, you right but learning online can be safe and active alternative in pandemic especially at lockdown.	Showing disagreement + justifying

The extract above suggests that Almaee and Abdallah, who cooperated to write the essay, exchanged a few content comments. When Abdallah added a new idea about online learning during the pandemic to his section, Almaee engaged with Abdallah's contribution and attempted to impose his opinion. He told Abdallah not to write about learning during the pandemic since online learning was mandatory. Although Abdallah posted a comment in

reply to Almaee that reflected his respect for his colleague's opinion, Almaee ignored Abdallah as he did not post a reply.

As in Group 1, participants in groups 4 and 5 did not post any cognitive comments in the discussion mode for debating about language. Although in each group two learners cooperated by acting as writer and editor, as indicated previously, no feedback or explanations were sought through the discussion mode by either the author or the editor.

### **Social interaction**

Analysing learners' social talk in groups 1, 2, 3, 4 and 5 provided evidence that learners in each group did not engage socially with each other. Instances of thanking, apologising, encouraging and offering praise did not occur during the activity. For example, learners in all groups did not interact socially throughout the activity, although each author in groups 4 and 1 posted one social comment to greet their colleagues. As shown in extracts 20 and 23, none of their group members reciprocated their greeting. In contrast, occurrences of non-social interaction have been observed in learners' talk, such as the use of harsh word in Extract 22 (i.e., 'you are wrong'). Furthermore, despite the fact that there were instances of using first-person plural pronouns (we) in learners' talk, the frequent use of second-person pronouns (you) and modals (should) in extracts 25 and 26 (you should mention, you shouldn't talk) indicated that each learner attempted to control and impose their authority over the task. Additionally, phrases such as 'your part' and 'your conclusion' in the same extracts highlighted an individual attitude to the task.

### **Contribution to the text mode**

Students' contributions to the text mode in all small groups showed a low degree of mutuality. There was a distinct division of work, as evidenced by an analysis of the learners' contributions to the text. According to the results, in groups 2 and 3, a few students divided



the task by working individually on a specific section of the essay (such as the introduction or a paragraph), whereas in groups 1, 4 and 5, one student wrote the entire essay while another edited it. Nevertheless, some students in all groups chose to take a passive role and did not participate in the text mode. The examples that follow show how the students cooperated to compose the GD essay.

In groups 2 and 3 learners cooperated through dividing the task. However, learners did not negotiate the process of dividing the task, rather each student selected one part of the essay.

Extracts 27 and 28 show how learners divided their essay.

**Extract 27: Group 2**

Google Doc interaction	Types of comments/edits
<p>Khaled (cooperative learner) wrote</p> <p>Body 1: studying online classes from home got more benefits and pros over studying in university. First, saving our time. For instance, we do not have to wake up early in the morning. Second, We do not have to get dressed up. Third, it is easy for introverts to participate and share thier ideas and thoughts. Moreover, online courses can offer more individual attention. Online courses provide recording sessions, which is a really good advantage of online learning. For example, if we were absent or we did not understand something during the class, we can check the recording sessions later.</p>	Adding new ideas
<p>Salman (cooperative learner) wrote</p> <p>Body 2: some people argue that studying in the class better for these reasons. students understand better in face to face and would not cheat on exams. for the first one i would argue that it is different for everyone some understand better when they are in the comfort of their home using a computer. and for the exams they could cheating inside the class.</p>	Adding new ideas
<p>Jihad (cooperative learner) wrote</p> <p>Con: Along the two sides of studying in class or taking an online course. Online courses developed the educational process in very interesting way which make the courses easier to attend and at the same time more practical to learn than the classroom learning because of the technology that used in the online courses.</p>	Adding new ideas

According to the above extract, students' writing behaviours in Group 2 reflect a low level of mutuality. three of the four students divided the GD essay into separate sections. The first paragraph was composed by Khaled, while the second was authored by Salman. Jihad was responsible for writing the conclusion. As evidenced by the extract, learners did not

collaborate to modify or expand each other's text or ideas. In addition, Fahad (the passive learner), contributed nothing to the task.

Similarly, Group 3 had a low level of mutuality in the text mode. Some learners cooperated to produce the task. Extract 28 showed that Almaee and Abdallah contributed to the text by dividing the task between them, while other learners in the group were inactive.

**Extract 28:** Group 3

Google Doc interaction	Types of comments/edits
<p>Almaee (cooperative learner) wrote</p> <p>1/ These days many universities around the world provide online study as alternative way of classroom learning. It be can be even more practical than the traditional learning. The traditional learning consumed consumes time and fuel to move from home to college or school each day whoever, online learning saves them you can move from class to class by just a click. Students can attend the class from anywhere.</p>	Adding new ideas
<p>Abdallah (cooperative learner) wrote</p> <p>2/ on the other hand. There are many disadvantages to study online. first con that i would like to discuss about it which is poor connection quality. sometimes when you are going to join a course you couldn't connect with session due to poor connection. for those who are facing electricity interrupting sometimes they are getting absences for this reason. universities should provide online courses in case of conflict with lecture's time.</p>	Adding new ideas

The extract above shows the pattern of learners' contribution in Group 3. Almaee wrote about the advantages of online learning in the first paragraph, whereas the second paragraph, which represents the disadvantages of online learning, was written by Abdallah. Learners often wrote their sections individually without editing or building on each other's text. The other two learners (Abdul Malek and Omron) remained passive and did not contribute to the text.

As mentioned previously, the students' writing behaviours in groups 1, 4 and 5 showed that one student wrote the GD essay and another collaborated by editing or expanding the existing text. However, the other members remained passive. Extracts 29, 30 and 31 show how students in groups 4, 5 and 1 created the GD essay

**Extract 29: Group 4**

Google Doc interaction	Types of comments/edits
<p>Bachir (cooperative learner) wrote</p> <p>there are many problems that make students leave university such as healthy problems. They can fall sick for time and cannot participate lectures for period. So that can cause him to leave university, but if there is online education in his university he can be at home and continue to study.</p>	Adding new idea
<p>→ Twejri (cooperative learner) wrote</p> <p><u>Nowadays</u>, there are many problems that make students leave university such as <del>healthy</del> <u>health</u> problems. <del>They</del> <u>Some students</u> <del>can</del> fall sick for <u>some</u> times and cannot participate <u>in</u> lectures for <u>a long</u> period. So that can <del>cause him</del> <u>may force them</u> to leave university, but if there is online education in <del>his</del> <u>their</u> university <del>he</del> <u>they</u> can be at home and continue to study.</p>	Correcting another formal error
<p>Bachir (cooperative learner) wrote</p> <p>online learning can helpful for students and parents by reducing spending a lot of money on their children's studies. It can also be a good way for many students to study in more faculties to another country without migrating.</p>	Adding new idea
<p>→ Twejri (cooperative learner) wrote</p> <p><u>In conclusion</u>, online learning can be helpful for students <u>to finish their studies easily</u>. <del>and parents</del> <u>In addition</u>, it helps students' <u>parents</u> by reducing spending a lot of money on their children's studies. It can also be a good way for many students to study <del>in more faculties to</del> <u>different majors from</u> another <u>foreign</u> country without migrating.</p>	Correcting another formal error

The previous extract from Group 4's GD version history indicated a low level of mutuality among learners. Since Bachir was the author and Twejri was the editor, they were the only contributors to the text. During the composition of the essay by Bachir, Twejri engaged in a critical review of Bachir's grammar and sentence structure. The other members in the group (Foheid and Fayed) were inactive and made no contributions to the text mode.

Likewise, Group 5 had a low level of mutuality: their GD essay was written by one learner (Misbah), whereas Rasheed contributed to text mode as an editor. The other three members (Abbas, Kthery and Faisal) were inactive learners during the process of writing.

**Extract 30: Group 5**

Google Doc interaction	Types of comments/edits
<p>Misbah (cooperative learner) wrote</p> <p>First and foremost, flexible students can study the online course material during their own time. It can also be attended at the comfort of your home. Online Education costs less as there is no cost for commuting. Moreover, it helps to save time. More so, students can attend a course at any time, from anywhere. There is no age limit for learners. They can improve and develop new skills by using online apps.</p>	Adding new idea
<p>→ Rasheed (cooperative learner) wrote</p> <p>First and foremost, <u>E-learning is more flexible than classroom learning.</u> s Students can study the online course material during their own time. <del>It</del> <u>They</u> can also be attended <u>these courses</u> at the comfort of <del>your</del> their home. Online <del>E</del> education costs less as there is no cost for commuting. Moreover, it helps to save time. <u>If we look thoroughly at the current pandemic of the COVID-19 we would attest and emphasize the need for the introduction of online courses by the universities.</u> <del>More so</del> Furthermore, students <u>from different age</u> can attend a course at any time, from anywhere. There is no age limit for learners. They can improve and develop new skills by using <u>useful</u> online <u>resources</u> or apps.</p>	Correcting + Extending another member's idea.

The extract above characterises the writing behaviour of the learners in Group 5. Misbah often added new ideas without doing any self-editing, as he seemed to leave the role of editing to Rasheed. After Misbah created a particular text of the essay, Rasheed engaged with what Misbah had written to edit and extend the text.

Although the degree of mutuality and the manner of cooperation in Group 1 resembled that of groups 4 and 5, whereby one learner adopted the author role and the other adopted the editor role while the rest of the group's members were inactive, students' writing behaviour showed that there was a conflict between writer and editor. The writer was often unwilling to incorporate the editor's suggestions and attempted to control the task. However, his dominance was always resisted by the editor. In the following example, the writing behaviour of learners and the conflict are explained.

**Extract 31: Group 1**

Google Doc interaction	Types of comments/edits
<p>Hagie (cooperative learner) wrote</p> <p>both online courses and learning in class are extremely amazing. However, student do better on online courses because it balance between your college and your family</p>	Adding new idea

and work.	
<p>Turki (cooperative learner) wrote</p> <p>Both online courses and learning in class are extremely amazing. However, students do better <del>on</del> <u>in</u> online courses because <del>it</del> <u>they can</u> balance between <del>your college</del> <u>their study</u> and <del>your</del> <u>their</u> family and work. <u>For example, students can take part in online learning whenever it is convenient for them without any problem.</u></p>	Correcting + extending another member's idea
<p>Hagie (cooperative learner) wrote</p> <p>Both online courses and learning in class are extremely amazing. However, students do better <del>in</del> <u>on</u> online courses because <del>they</del> it <del>can</del> balance between <del>their study</del> your college and <del>their</del> your family and work. <del>For example, students can take part in online learning whenever it is convenient for them without any problem.</del></p>	Deleting another's writing and editing
<p>Turki (cooperative learner) wrote</p> <p>Both online courses and learning in class are extremely amazing. However, students do better <del>on</del> <u>in</u> online courses because <del>it</del> <u>they can</u> balance between <del>your college</del> <u>their study</u> and <del>your</del> <u>their</u> family and work. <u>For example, students can take part in online learning whenever it is convenient for them without any problem.</u></p>	Correcting + extending another member's idea
<p>Hagie (cooperative learner) wrote</p> <p>Both online courses and learning in class are extremely amazing. However, students do better <del>in</del> <u>on</u> online courses because <del>they</del> it <del>can</del> balance between <del>their study</del> your college and <del>their</del> your family and work. <del>For example, students can take part in online learning whenever it is convenient for them without any problem.</del></p>	Deleting another's writing and editing

The previous extract provides evidence that two learners engaged in a high level of disagreement with each other's contributions. The learners' writing behaviours reflected that the author had an individual stance toward ownership of the text. The author and editor had difficulty reaching a consensus regarding the essay. As an example, Turki expanded and edited the text correctly; however, Hagie ignored his colleague's contribution and omitted Turki's addition without explanation. Turki added to the text again, but Hagie refused to accept it and deleted it again. Furthermore, learners engaged in a disagreement over the choice of preposition (i.e. 'on' online courses or 'in' online courses). As demonstrated above, learners did not engage in discussion to explain or justify their opinions when a disagreement arose; rather, they engaged in a series of deletions of each other's contributions. However, the last resolution, as shown in the extract above, was imposed by the more dominant member (Hagei) even though his resolution was wrong.

**Table 4.18** A summary of learners' level of mutuality across the two conditions

Level of mutuality	
Experimental condition (GMCW with teacher intervention)	Control condition (GMCW without teacher intervention)
<p>Regardless of learners' patterns of interaction, the level of mutuality of learners who collaborate with teacher intervention ranged from moderate to high.</p> <p>Learners who worked collaboratively in <i>collaborative</i> or <i>collaborative/passive</i> patterns displayed high levels of mutuality. By sharing decision-making and authority, they planned their task collectively. During drafting, Mutual scaffolding was achieved through the pooling of each other's knowledge resources. First-person pronouns (we) dominated their discourse and there was significant social interaction between them. In the text mode. They mutually added, extended and edited on each other's existing ideas while using the discussion mode in a complementary manner to justify their editing.</p> <p>In two small groups out of six there was only one passive learner.</p> <p>Learners in an <i>expert/novice</i> relationship exhibited a moderate level of mutuality. learners who assumed the role of expert encouraged novices to interact and contribute. The always offer unidirectional scaffolding to novices. In other words, by posing guiding questions, requesting, or even offering overt agreements, experts stimulate the answer from the novices, and novices always welcome such assistance. They interacted socially, and they frequently used first-person pronouns (we) in their conversation.</p>	<p>All learners who collaborated without teacher intervention showed a low level of mutuality.</p> <p>All learners displayed a <i>cooperative/passive</i> relationship, where most of them adopted a passive role and a few learners cooperate to complete the task.</p> <p>There was an absence of mutual discussion during the writing GD essay.</p> <p>Learners' initiative to discuss was not reciprocated by others.</p> <p>students did not engage in planning discussion, and the decision of organising the task was often made by one learner.</p> <p>There was evidence of a discussion about not planning the task in one small group.</p> <p>In all small groups there were no instances of mutual assistance.</p> <p>In two groups out of five, some students contributed to the text mode by writing individually in particular section of the essay.</p> <p>Three of the five groups divided roles, with one student writing the essay and the other editing it without justification.</p> <p>In one group, there were some conflicts that arose during the editing process.</p> <p>students did not interact socially and there were instances of using the second-person pronoun (you).</p>

#### 4.3.4 Summary of the GD-collaboration process

Based on the analysis of the GD-collaboration process, it was concluded that learners who performed the GMCW task with teacher intervention (experimental condition) displayed a significantly higher level of collaboration than those who performed the same task without teacher intervention (control condition). The quantification (frequency counts) of collaborative behaviours revealed that in both modes of GD interaction, students in the experimental condition generated more collaborative comments and revision behaviours than those in the control condition. Furthermore, the analysis based on Storch's (2002) criteria for

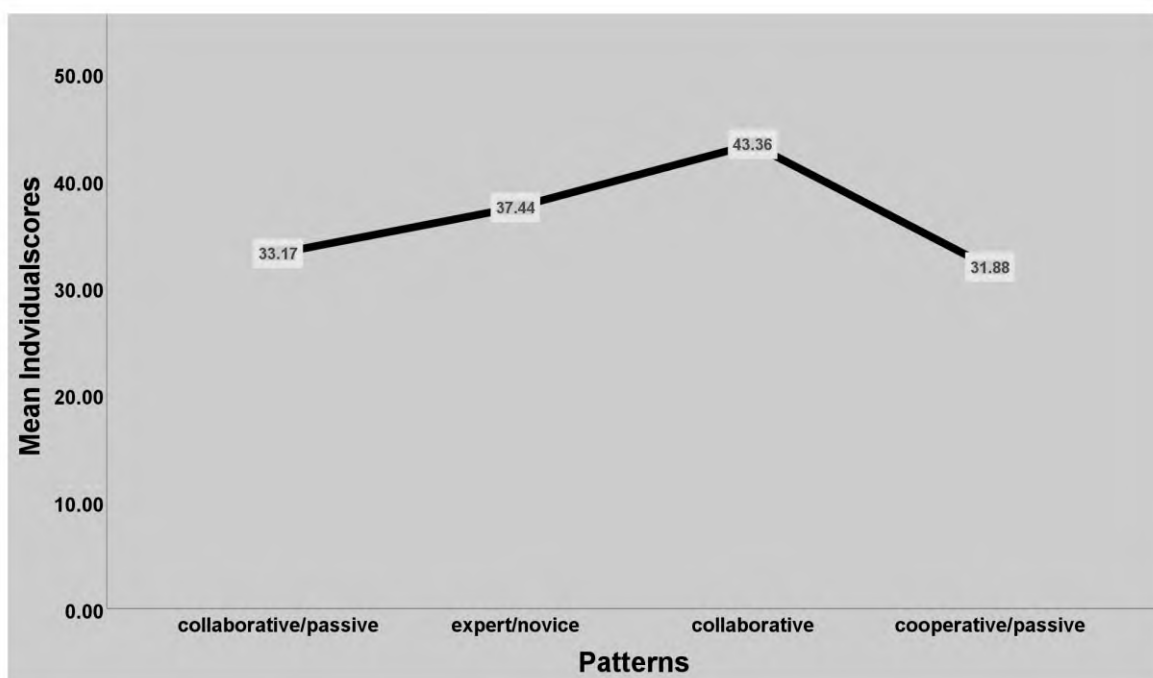
equality and mutuality revealed that the small groups in the two conditions demonstrated different patterns of interaction. Therefore, the level of equality and mutuality in the experimental condition varied from moderate to high depending on learners' patterns of interaction (*collaborative*, *collaborative/passive* and *expert/novice*). In the control condition, on the other hand, there was a low level of equality and mutuality because all of the small groups engaged in one pattern of interaction (*cooperative/passive*).

#### 4.4 Students' patterns of interaction and their outcomes

To determine whether there are any differences in outcomes among the learners' patterns of interactions, this study investigated whether the differences in learners' patterns of interaction result in different outcomes through providing Descriptive Statistics for mean scores of each pattern identified in the study. Table 4.19 provides the means and standard deviations for each pattern. The results show that learners in the *collaborative* pattern got higher mean scores compared to other patterns, mean = 43.2. while learners who displayed an *expert/novice* pattern got greater mean scores than those exhibited a *collaborative/passive* pattern (mean = 37.4, 33.2). However, the mean of the *cooperative/passive* pattern was the lowest compared to other patterns, with a mean of 32. All findings are shown in Table 4.19 and Figure 4.1 below.

**Table 4.19** The means for each of the four patterns

Patterns	N	Mean	Std. Deviation
<i>Collaborative/passive</i>	9	33.1667	7.66893
<i>Expert/novice</i>	9	37.4444	4.45424
<i>Collaborative</i>	7	43.3571	6.41427
<i>Cooperative/passive</i>	21	31.8810	5.71818
Total	46	34.9674	7.16039



**Figure 4.1** The means for each of the four patterns

## 4.5 Students' attitudes

The comparison of students' attitudes toward GMCW with and without teacher intervention was made to gain a better understanding of the factors that shape and influence students' outcomes and levels of collaboration. Learners' responses alluded to their beliefs about language learning as well as their cultural backgrounds, which held that teacher intervention is essential in controlling and promoting students' participation and collaboration. As a result, two major themes were considered when reporting the comparison of learners' attitudes across the two conditions. These two themes are that GMCW fosters L2 learning and that teacher intervention is required during students' collaboration.

### 4.5.1 GMCW activities foster L2 learning

Language-learning beliefs shape learners' attitudes and preferences and may lead them to act and react in certain behaviours. Learners who participated in GMCW with teacher



intervention, for example, believed that the GMCW activities provided an opportunity to learn an SL. Thus, they exhibited a positive attitude toward the GD-activity and high level of collaboration during the writing of the collaborative activity using GD. While learners who engaged in GMCW without teacher intervention believed that interacting in a group was a waste of time, they thought that writing individually and practising grammar drills with the teacher was the best approach to advancing their language skills. Therefore, they hold a negative attitude toward GD-collaborative writing activity and displayed a low level of collaboration during completing GD- collaborative writing activity.

### **Experimental condition (GMCW with teacher intervention)**

Learners in the experimental condition, regardless their pattern of interaction, stated that interacting with group members improved language abilities. For instance, learners working in a *collaborative* manner reported that interaction via GD increased learning motivation and allowed group members to pool their knowledge resources. They believed that exchanging ideas and experiences to reach a joint resolution helped them to improve their linguistic and grammatical accuracy.

I enjoyed interacting with my group. Participating in dialogue provides an opportunity to improve grammatical accuracy. Collecting ideas and finding appropriate vocabulary collaboratively, rather than individually, is a helpful writing technique. Through interaction, we exchanged valuable comments and ideas. As a result of our conversations on linguistic faults, we were able to overcome our language issues. This procedure provides me and my peers with new knowledge.

Ali, Group 3

I felt that we engaged in the activity actively because of the interaction. The merit of interaction appeared when we faced language difficulties. Indeed, all members of the group improved their language skills and learned from each other. by interaction, we were able to collect many ideas and select the most appropriate vocabulary that

helped us produce a good quality essay. I'll admit that my English got better after taking part in such a writing course.

Mshari, Group 5

Despite the collaborative nature of the learning, one of the group members was passive in groups 1 and 6. Nevertheless, learners valued the opportunity to be involved in collaborative writing using GD. They reported that interaction via GD was the most effective source of learning and immediate feedback. They mentioned that the reciprocated assistance they received during the collaborative dialogue enabled them to plan their task effectively, find a common solution to their language errors, articulate their ideas in well-structured sentences and advance their language learning.

it was a good opportunity to interact with others. Obviously, we made mistakes writing in a second language. Thus, not only did we notify each other of our errors during interaction, but exchanging help during the collaborative dialogue also helped us resolve the problems. Any website can provide you with the information you require, but it is preferable if the information comes immediately from someone on the same level as you.

Ameen, Group 1

Collaboratively writing via GD was an excellent experience. Due to immediate feedback, we were able to recognise our mistakes and avoid them. Collaboration at the planning stage taught me how to plan effectively. Interacting at the planning stage was useful for both collecting more ideas and organising the essay. When we composed the essay together, my peers constantly expanded on my ideas and assisted me in expressing my intended ideas in a meaningful way. Collaboration and interaction with my friends have helped us improve our language skills.

Abdullah, Group 6

Along with the chance to improve their language abilities, learners engaged in *expert/novice* relationships valued collaborative discussions using GD as an opportunity to encourage each other to collaborate and achieve the task successfully. According to Bader, who acted as the expert in Group 2, two factors contributed to his positive attitude about interacting during

writing using GD: the possibility of developing life skills through communication with others and the opportunity to provide and receive language-related assistance.

Interacting with my colleagues helped me to improve my skills, such as communication skills. It also taught me how to deal with people, which could help me succeed in my future job. In addition, it provided us with a chance to learn from each other, such as when my friend reminded me about grammar rules or introduced me to new vocabulary. Through interaction, I could encourage my friends to collaborate. As a result of pointing out others' mistakes and posting some encouraging comments during the interaction, group members can learn and complete the task successfully.

Bader, Group 3

Firas, who assumed the role of novice in Group 4, regarded collaborative writing using GD as an important method for learning the language. During the conversation, he found his colleagues' suggestions helpful in improving his language skills.

Interaction is the most effective method of learning a second language. The interaction had a number of advantages. For example, I learn from my friends how to represent and organise ideas. I could be mistaken, so my friends helped me recognise my grammar mistakes. Rather than pressuring me to make the change, they simply presented options with justification. Their advice is often right and helpful, which makes me a better writer.

Firas, Group 4

### **Control condition (GMCW without teacher intervention)**

Learners who engaged in GMCW without teacher intervention expressed dissatisfaction with the activity. According to the students, writing collaboratively takes too much time, and doing the grammatical drills under teacher supervision would improve their language skills more than writing in groups.

For example, in Group 1, Hagia expressed his preference to practice grammar exercises in class and write the essay individually. He also valued teacher's feedback over that of his

peers. According to him, editing each other's writing did not improve their grammar accuracy, since the errors may have been edited incorrectly.

Because each task took us two or three weeks to complete together, I prefer to write alone. Because we are on the same level, we will not learn if we edit each other's text. We may also edit the sentences incorrectly. The teacher will correct our mistakes and he know the correct answer. We should write individually and practice grammar rules inside the class.

Hagie, Group 1

In Group 2, Khaled had reservations about collaborative writing as well. He believed that group activities would be better for speaking than for written activities. In his opinion, the only advantage of writing together while dividing the work is that it reduces the stress associated with individual writing. But he thought that practising grammar drills instead of writing collaboratively was a better way to improve writing grammar accuracy.

Dividing one essay between the group members was less stressful than individual writing. However, interaction may be effective in a speaking class but not in a writing class, unless you work with peers who are better at language than you. We used to practice grammar tasks during writing class. I think if we did so instead of spending all of our time collaborating, we could improve our writing grammar.

Khaled, Group 2

Abdallah in Group 3 also expressed his preference to work independently. He admitted that due to the difficulty of interacting with others, they do not learn and improve their language. He also mentioned that he avoided interaction by posting criticism and editing others' mistakes to prevent conflicts and maintain the relationship.

I think writing is best done individually. We could not engage in an interaction that could improve our language; students will not accept comments from their colleagues. I noticed mistakes in the writings of my friends, but I intentionally avoided posting any comments or editing these errors because I don't like getting involved in arguments with them.

Abdallah, Group 3

In addition to believing that the previous method of teaching writing (the grammar-based approach) was superior to interaction, Fayed, who played a passive role in Group 4, believed that poor group work management and a lack of motivation prevented them from engaging in collaborative writing effectively. He acknowledged that since the group members did not discuss their roles, most of them were passive throughout the activity and relied on one member to complete the task.

Without discussing our roles, we always have the same person in the group write the essays. He might believe he is the best performer in the group. I couldn't participate in the activities because I didn't know what to do. Most of the group's members did nothing because they knew that this person would complete the whole essay. We spend lots of time doing nothing. I think I gained more from doing grammar exercises in the writing class last term.

Fayed, Group 4

Similarly, Rasheed, who acted as Group 5's editor, emphasises the significance of grammar-based approaches to writing and prefers to write individually. He also stated that lack of group management and low self-confidence prevented most members of the group from participating in collaborative writing.

I think producing one essay together is impossible. Because we all thought our friend was better than us (he is referring to the writer), we let him write the essay. I edited my friend's writing just because I wanted to do something. To be honest I was not confident about my editing. I believe doing grammar exercises with the teacher in class and writing the essay individually as homework will benefit our writing more than writing the essay together.

Rasheed, Group 5

#### **4.5.2 Teacher's intervention is essential in collaborative activity**

Although learners in both conditions were aware that the primary design of GD-collaborative activity presumes student-centrality, their attitudes toward GD-collaborative activity suggested that teachers should monitor and encourage student participation and collaboration. For example, learners who participated in GMCW with teacher intervention admitted that they would not have been able to collaborate successfully if their teacher had not intervened. Meanwhile, learners who participated in GMC without teacher's intervention believed that the lack of teacher guidance led to ineffective group management and a reluctance to participate.

##### **Experimental condition (GMCW with teacher intervention)**

All learners in the experimental condition, regardless of their patterns of interaction, stated that teacher interventions not only promote their participation but also their collaboration. For instance, learners worked in a collaborative pattern reported that teacher's intervention guided them to achieve the task in a *collaborative* manner.

The presence of the teacher and his instruction in the form of written comments helped us to avoid the bad behaviour of collaboration and follow the appropriate one. He always guides us to interact with each other in order to learn and improve our language. I think without him we would not have collaborated effectively.

Ali, Group 3

The teacher's interventions were effective in encouraging us to collaborate. The teacher's comments motivate and encourage us to interact and learn from each other. We were a good group because we followed our teacher's instructions. For example, we did not harm each other or delete each other's writing, but we discussed in order to write an accurate essay and gain knowledge from each other.

Mshari, Group 5

Similarly, learners displaying a *collaborative/passive* pattern admitted that they did not expect to learn much at the beginning of the activity; however, after following the teacher's instructions, they worked collaboratively and improved their English language. Furthermore, they expressed regret that some learners in their groups did not engage in interaction and thereby missed opportunities to learn and develop their language skills.

I did not think I could collaborate and interact with my friends at first, but after the teacher advised us that we could benefit from each other if we interacted and collaborated, I realised that those who participated seriously could gain knowledge and improve their language abilities. I believe that learners who do not follow the teacher's instructions have not learned or developed their language.

Ameen, Group 1

The teacher's intervention was extremely beneficial. I didn't know how to collaborate initially, but the teacher guided us on how to work effectively by encouraging us to interact and collaborate in order to correct and learn from each other's mistakes. Due to his instructions, we were able to interact and improve our language skills. I really feel sorry for those members of the group who avoided interacting with us as they lost a great opportunity to learn.

Abdullah, Group 6

The teacher's instructions were also appreciated by the learners, exhibiting an *expert/novice* relationship. As a result of the teacher's intervention, both Bader and Firas comprehended the concept of collaboration and the significance of interaction in language learning.

Without the teacher's intervention, I believe we would not understand the importance of interaction in language learning or what it means to collaborate. Teacher

encouraged and supported our teamwork. He explained to us how to collaborate with each other's. we were able to work effectively with each other because he motivated us to do so.

Bader, Group 3

The teacher gave us guidelines on how to work together. He described the collaborative actions we ought to do. Since he highlighted the value of interaction in language learning, we collaborated to improve our language and achieve the task effectively

Firas, Group 4

### **Control condition (GMCW without teacher intervention)**

While learners who collaborated without their teacher were not directly asked about their opinions about teacher's intervention, they did note that the absence of the teacher contributed to the high rates of students' reluctance to participate and poor management within their groups. For example, Hagie expressed frustration in Group 1 when no one reciprocated his initiative to plan the task collaboratively, suggesting that teacher's intervention may be required in such situations.

We did not plan the task together. Usually, I wrote the essay by myself without engaging in planning discussion. I felt no one liked to engage with me. I think the teacher should be present to involve all students in the work

Hagie, Group 1

Khaled in Group 2 acknowledged that they had difficulty engaging in collaborative writing stages. he stated that their teacher should assist them because it was difficult for them to interact and write at the same time.



We always gather our ideas and divide the tasks, which makes writing easier. But we didn't talk during writing. It was difficult to write while also interacting. Also, not all friends were helpful, some of them did nothing. Engaging in the writing stages collaboratively was challenging. I think the teacher could have helped us with the task if he had been there.

Khaled, Group 2

Likewise, In Group 3, Abdallah stated that it is difficult to edit the texts of others without offending them. However, if a teacher requests collaboration, students will comply.

It was uncomfortable to write with my friends. We couldn't plan or edit the essay together. It's hard to edit without making someone angry. Students won't listen to their friends, but if the teacher is there and asks them to work together, they might.

Abdallah, Group 3

In Group 4, Fayed also suggested a teacher intervention to ensure that all students were involved in the collaborative writing process.

Because one person always dominated, we had few writing opportunities. The teacher should observe so every student can participate.

Fayed, Group 4

As a way to increase students' confidence and encourage their participation, Rasheed in Group 5 suggests that teachers engage with students at every stage of the collaborative writing process.

During writing stages, we did not collaborate. Most group members lacked writing confidence. If the teacher was with us and encouraged the students, they would participate.

Rasheed, Group 5

#### **4.5.3 Summary of learners' attitudes**

The analysis of learners' attitudes revealed that all the experimental groups' interviewees enjoyed the GD-mediated collaborative writing experience and felt that it had a positive

impact on their writing abilities. They appeared to recognise the significance of interaction in language development. According to their opinions, the teacher's intervention influenced their language-learning beliefs and facilitated effective collaboration. Students in the control groups, on the other hand, were pessimistic about group work and preferred writing individually over collaboratively. They believed that interacting with others did not improve their language skills, whereas engaging in grammar drills (a grammar-based approach) improved their language and writing accuracy. However, they suggested that if the teacher joined them in the process of collaboration, they might be able to collaborate effectively and benefit from it.

## Chapter 5 Discussion

### 5.1 Overview

Reviewing FTF literature in relation to the effect of collaborative writing on improving learners' outcomes and on language-learning development reveals mixed results (Kim, 2008; Shehadeh, 2011; Kuiken & Vedder, 2002). This is because putting students in groups to collaborate does not result in their collaboration, and they may engage in non-collaborative patterns of interaction that do not result in language learning (Storch, 2002, 2013, 2018).

In previous research on collaborative writing in SL/FL classrooms using Web 2.0 tools, it has been demonstrated that advanced technology promotes collaboration among students. According to the findings of this research, collaborative writing using Web 2.0 tools encourages students to engage in mutual interaction (Arnold et al., 2009; Elola & Oskoz, 2010; Bradley et al., 2010; Lee, 2010; Kost, 2011; Li & Zhu, 2011; Li, 2013; Alghasab, 2015; Alkhateeb, 2020; Alharbi 2019; Kitjaroonchai & Suppasetseree, 2021), as well as co-construct the joint text by adding ideas, expanding and elaborating, and editing their own and their classmates' work (Kost, 2011; Arnold et al., 2009, 2012; Kessler, 2009; Kessler et al., 2012; Abrams, 2016; Woo et al., 2011; Aydin & Yildiz, 2014; Woo et al., 2013; Lawrence & Lee, 2017; Alharbi, 2019; Alkhateeb, 2020; Elola & Oskoz, 2010). Even though all of the preceding collaborative behaviours have been documented, some studies acknowledge the possibility of non-collaborative patterns such as *cooperative*, *dominant/passive* (Arnold et al., 2009, 2012; Bradley et al., 2010; Alkhateeb, 2020; Abrams, 2016; Kessler & Bikowski, 2010; Li & Zhu, 2011; Alghasab, 2015; Kitjaroonchai & Suppasetseree, 2021). According to L2 researchers, the fact that learners are likely to follow non-collaborative patterns during

collaborative writing activities is a key reason why previous research on the outcomes of collaborative writing has produced mixed results. (Strobl, 2014; Abrams, 2019; Li & Zhu, 2017; Alkhateeb, 2020; Kuteeva, 2011; Bikowski & Vithanage, 2016). According to a review of studies relating to factors that affect learners' collaboration, teacher intervention may enhance collaboration if interventional collaborative behaviour is employed (Arnold, Ducate, & Kost, 2009, 2012; Alghasab, 2015; Woo et al., 2013). These studies, however, did not examine the impact of teacher intervention on the outcomes of learners.

The purpose of this thesis was to fill this literature gap by comparing the impact of GMCW with and without teacher intervention on learners' writing outcomes. To provide a comprehensive picture of the impact of teacher intervention, this thesis is one of the first studies that did not focus only on examining outcomes on subsequent performance to provide evidence of language learning, but rather on examining collaboration and attitudes of learners.

The sections that follow discuss the current study's findings and their explanations, in which GMCW, with and without teacher intervention, are compared in relation to the three aspects that the current study examined (collaboration process, outcomes and attitudes). Following a brief discussion of the main findings in section 5.2, the findings pertaining to learners' levels of collaboration and patterns of interaction in the two conditions are discussed in section 5.3. A discussion of the differences in learners' outcomes between the two conditions is presented in section 5.4, along with a discussion of the outcomes of the learners and their patterns of interaction. Section 5.5 discusses the differences between learners' attitudes in the two conditions.

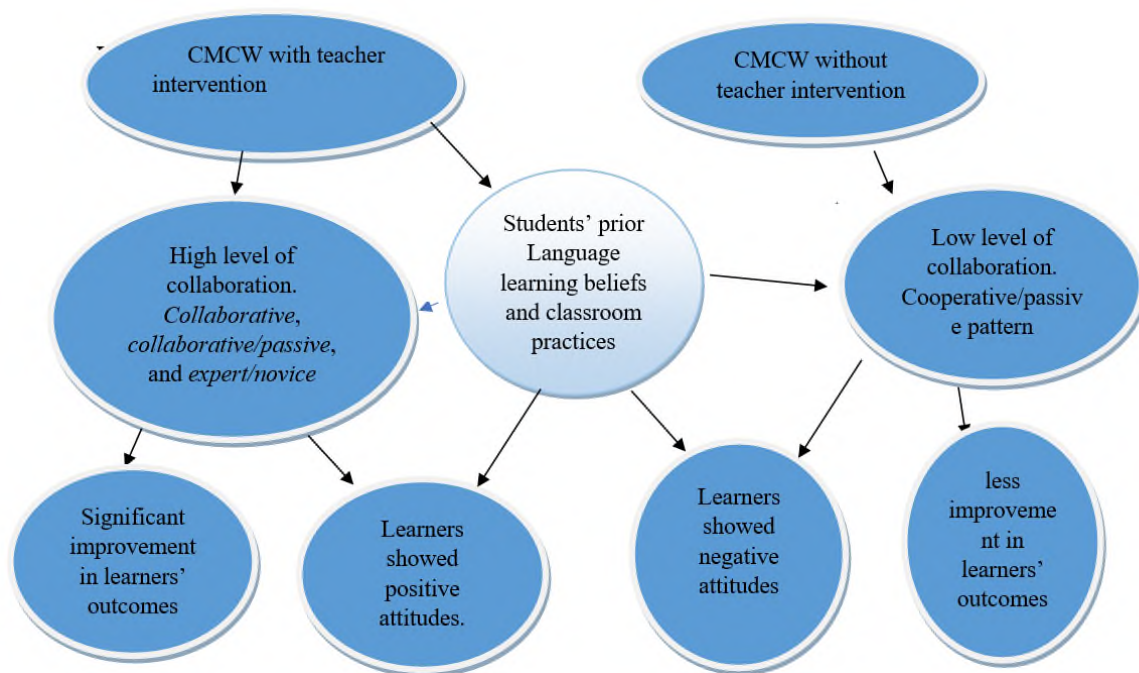
## 5.2 The key findings

The analysis of learners' collaboration process along with examining their outcomes and attitudes led to the following main findings:

1. GMCW with teacher intervention impacts learners' outcome significantly. Although learners in both conditions improved their outcomes, the results indicated that the outcomes of learners in the experimental condition (GMCW with teacher intervention) improved more significantly than those of learners in the control group (GMCW without teacher intervention).
2. GMCW with teacher intervention improves the level of collaboration among students. According to the analysis of learners' collaboration processes in the two conditions, learners who engaged in GMCW with their teacher's intervention collaborated better than learners who engaged in GMCW without. Learners who collaborated with their teacher's intervention generated more collaborative comments and revision behaviours. In addition, the analysis based on Storch's (2002) criteria of equality and mutuality showed that learners who participated in GMCW with teacher intervention exhibited patterns of interaction conducive to learning, such as *collaborative* and *expert/novice*, with only two learners taking a passive role. Those who engaged in GMCW without teacher intervention displayed a non-collaborative pattern (i.e., a *cooperative/passive* pattern).
3. The results also confirm the findings of previous studies in that *collaborative* and *expert/novice* patterns are conducive to learning. The descriptive analysis of the learners' patterns of interaction and their outcomes suggested that learners engaged in these two patterns improved their outcome more than those who engaged in other patterns of interaction.

4. The findings also suggested that GMCW with teacher intervention impacts learners' attitudes positively. Learners who engaged in GMCW with teacher intervention held positive attitudes toward the collaborative writing activity via GD and believed that interacting was the best approach to learn L2. While those who engaged in GMCW without teacher intervention showed a negative attitude toward the GD-collaborative activity.
5. It can be inferred that learners' outcomes and attitudes toward collaborative activity are strongly associated with their level of collaboration. Moreover, this study suggests that advanced collaborative platforms such as GD will not promote collaboration among students without the support of the teacher.

Using mixed-methods and considering learners' collaboration process, outcomes and attitudes, findings revealed that promoting learners' collaboration and impacting their language-learning beliefs through teacher intervention led to significant improvements in outcomes and positive attitudes toward the activity. As depicted in Figure 5.1, varying degrees of collaboration among learners in the two conditions resulted in different outcomes and attitudes. The teacher intervention in the experimental condition influenced learners' language-learning beliefs and promoted their level of collaboration, thus encouraging them not only to exhibit positive attitudes, but also to participate in language learning and improve their writing outcomes. Those in the control condition expressed low levels of collaboration and imported their prior language beliefs, resulting in negative attitudes and less improvement in writing outcomes. The sections that follow discuss the influence of CMCW with teacher intervention versus CMCW without teacher intervention on the study's main aspects, which are as follows: (1) learners' collaboration process, (2) learners' outcomes and (3) learners' attitudes. The discussion begins with learners' collaboration process, because the level of collaboration among learners influences the other two factors.



**Figure 5.1** The Impact of CMCW, *with* and *without* teacher intervention

### 5.3 Collaboration process across the two conditions

The level of collaboration among learners in GMCW with teacher intervention differs significantly from that without teacher intervention. Furthermore, learners' in GMCW with teacher intervention engaged in *collaborative*, *collaborative/passive* and *expert/novice* patterns, whereas those who engaged in GMCW without teacher intervention showed a *cooperative/passive* pattern.

#### 5.3.1 Level of collaboration

Learners' comments in the discussion mode and revision behaviours in text mode were frequency counted in the experimental and control conditions to examine to what extent learners collaborate in each condition. Generally, learners' who participated in GMCW with teacher intervention generated more comments and revision behaviours than learners' who engaged in GMCW without teacher intervention. The unexpected finding was that there was a big difference in terms of the number of generated comments between the two conditions.

This suggested that there was an absence of discussion among learners engaged in GMCW without teacher intervention. This result contradicted other studies that claimed that Web 2.0-mediated collaborative writing enhanced learners' interaction (Kost, 2011; Stroble, 2014; Elola & Oskoz, 2010). This reluctance to interact can be explained by the interview data; the majority of interviewees in the control condition admitted that a lack of language confidence and a lack of motivation from the teacher led them to disengage.

Conversely, a significantly greater number of comments were generated by students who interacted with their teachers during all writing stages. Under this condition, all small groups exhibited an abundance of comments that allowed them to plan their tasks effectively. In addition, learners produced a large number of cognitive comments during the drafting phase. In these comments, they questioned one another's use of language, offered suggestions and feedback, elaborated on one another's ideas, justified their contributions, and sought clarifications. Students also formed strong relationships by posting numerous social comments to encourage, compliment and apologise to each other. Researchers have reported on the high number of comments generated by students demonstrating high levels of collaboration in studies that shed light on the quantity of learners' comments (Alharbi, 2019; Li, 2013, 2014; Alkhateeb, 2020; Kitjaroonchai & Suppasetseree, 2021; Elola & Oskoz, 2010). In these studies, however, it was suggested that collaboration tools such as Wikis and GD encouraged learners to provide a high number of comments, whereas in this study, teacher intervention contributed to this result. In the interview, students reported that teacher interventions helped them to collaborate effectively. According to them, the teacher's instructions and encouragements facilitated their collaboration. However, the current study's finding contradicts those of Alghasab (2015), who studied participants from a similar background (EFL Kuwaiti learners). In Alghasab's study, there was evidence of a lack of discussion even when a teacher was present. The qualitative analysis of teacher behaviour in



Alghasab's study revealed that two out of three teachers either encouraged individual work or stood back and only asked students to participate. This difference can be attributed to the fact that the teachers in Alghasab's study were not trained in how to intervene, whereas in the current study, the teacher received pedagogical training on how to effectively intervene.

Learners in the experimental condition of the current study actively participated in discussions about form and meaning. Notably, every small group showed evidence of discussing and offering feedback on language-related issues in addition to organising and planning ideas. This result contradicts with previous research (e.g., Elola and Oskoz, 2010; Elabdali and Arnold, 2020), which suggested that learners in Wiki prioritise meaning discussion. The participants in these studies, however, differ from those in the current study in terms of their educational and cultural backgrounds, as well as their varied degrees of language proficiency. According to Elola and Oskoz's (2010) study, learners' attention to meaning was caused by their high level of language proficiency, whereas in Elabdali and Arnold's (2020) study, task (short story) was responsible for their focus on meaning.

The result of Alharbi's (2019) study, which was carried out in the same setting with students having comparable educational backgrounds as the current study, also conflicts with this finding. According to Alharbi's research, EFL Saudi students who are used to a grammar-based approach to learning typically focus on form more than meaning in conversations. However, in the current study, teacher intervened by employing some strategies such as urging students to provide feedback to each other, offering hints to correct language-related errors, and emphasising the importance of effective planning discussion. These strategies encouraged and motivated students to discuss form and meaning aspects. Therefore, this study fully agrees with Alghasab (2015), who asserted that teacher interventional collaborative behaviour helps learners focus on meaning and form in discussions.

In terms of the level of learners' contribution in the text mode, learners in both conditions generated a large numbers of revision behaviours including deleting, adding, expanding and correcting language errors. However, learners in the experimental condition contributed more to their GD joint text than learners in the control condition. This finding contradicts the findings of Arnold et al. (2009), who discovered that the totals of revision behaviours for each group, whether working with or without a teacher, were similar. However, in their study, data were collected solely from Wiki archives and analysed quantitatively (frequency acquaint), whereas in the current study, data were triangulated and analysed using a mixed methods approach. As a result, qualitative data of learners' contributions to text mode in GD and of learners' perceptions of activity revealed that teacher intervention in experimental groups promoted learners' contributions and influenced their language learning beliefs, as learners admitted that teacher played a role in encouraging them to participate and improve their language skills, while those in the control groups mentioned that the absence of teacher during the collaboration process led most students to be inactive. Arnold et al. (2012), In a subsequent study, reanalysed the data to examine learners' level of contributions to Wiki in both classes, and the results indicated that the teacher did not promote collaborative contributions because he critiqued students' texts individually. This behavior minimized students' contributions and forced them to focus solely on their text. It should be pointed out that, in the current study, teacher was trained in how to intervened; Thus, teacher's manner of intervention is what determine learners' level of contribution (Alghasab, 2015).

learners in the experimental condition added more ideas to their joint text, performed more formal error corrections, and expanded ideas than those who worked without their teacher's intervention. However, it appears that in both conditions the most commonly observed writing act was the addition of new ideas. This finding offers evidence that learners prioritise meaning over form. This finding supports previous studies examining learners' attention to

form or meaning, which showed that learners pay more attention to meaning during writing collaboratively via Web 2.0 platforms, where the most frequently observed practice is adding ideas to written text (Kessler, 2009; Mak & Coniam, 2008; Woo et al., 2011; Kessler et al., 2012; Arnold et al., 2009, 2012; Aydin & Yildiz, 2014; Elabdali & Arnold, 2020; Abrams 2016). According to Mak and Coniam (2008) and Woo et al. (2011), Chinese learners prioritised adding ideas to the text over making form-editing changes because of their younger age and lower level of language proficiency. Furthermore, Woo et al. (2011) proposed that the presence of spell checkers on the Wiki and easy access to the internet influenced learners to pay more attention to adding ideas to the content instead of focusing on grammar editing. Therefore, these explanations could account in the current study for the greater frequency of adding ideas to the content in both conditions for the EFL lower-intermediate Saudi students. However, it should be noted that no data was collected regarding the reason behind learners' attention to form or meaning, as this is not the focus of the study. Nevertheless, this finding contrasts with the findings of Alghasab (2015), who reported that students collaborated with a teacher, editing and expanding joint texts rather than adding more ideas to the content. According to her, this can be attributed to Kuwait's educational system, which emphasises grammar rules in teaching English writing, as well as the teacher's example and instructions regarding how students should edit a text. The Saudi learners in the present study are similar to Kuwaiti learners in terms of their educational system, so it may be the manner of teacher intervention that explains the differences between the findings of the two studies. However, Alghasab's (2015) study is limited in its lack of quantitative analysis of learners' editing. Therefore, it is difficult to claim that learners prioritise form over meaning without providing reliable evidence and demonstrating the numbers of each contribution.

However, Alghasab (2015), Bradley et al. (2010) and Abrams (2016) pointed out that collaboration in text mode requires learners to modify their own texts as well as the texts of others. They asserted that the extent to which students collaborate and share text ownership is reflected in the extent to which they edit each other's writing. This viewpoint is supported by the results of this study regarding revision distribution in terms of self-revision, where students revise their own texts, and other revisions, where students edit and build on each other's writing. According to the findings, both self and other revisions occurred in both conditions; however, learners in experimental groups engaged with each other's texts more than those in the control condition.

### **5.3.2 Patterns of interaction**

Using SCT as a theoretical framework, group learning activities create interactions that give learners a chance to learn the target language through interaction. However, SLA researchers argued that interaction in a group does not always lead to collaboration (Storch, 2002, 2009; 2013; Tan, Wigglesworth, & Storch, 2010; Rouhshad & Storch, 2016; Li & Zhu, 2011; Bradley et al., 2010; Abrams, 2016; Elabdali & Arnold, 2020; Alkhateeb, 2020; Kitjaroonchai & Suppasetseree, 2021). According to their arguments, the degree of reciprocal interaction between learners, or what Storch termed 'mutuality', can be used to assess the level of collaboration. The level of mutuality refers to the extent to which learners engage in mutual feedback, allowing them to engage in collective scaffolding, in which their language gaps are bridged and they jointly construct new knowledge that exceeds their individual capabilities. Additionally, they claim that the degree of learners' contribution to the construction of the text and to decision-making, or what Storch called 'equality' in her model of dyadic interaction (2002), is also a factor to consider when measuring learners' collaboration.

In this study, analysing learners' levels of mutuality and equality in the discussion and text modes of interaction provided by GD, it was found that learners adopted a similar role in both text and discussion modes of GD. This is contrary to Alkhateeb's (2020) and Elabdali and Arnold's (2020) findings that learners' levels of mutuality and equality varied by mode. Examining the level of mutuality and equality, however, revealed that students participating in GMCW with teacher intervention displayed *collaborative*, *collaborative/passive*, and *expert/novice* patterns. While in GMCW without teacher intervention, learners displayed a *cooperative/passive* pattern. This finding corroborates previous research that found that learners in online collaborative writing engaged in various patterns of interaction (Li & Zhu, 2011; Bradley et al., 2010; Abrams, 2016; Elabdali & Arnold, 2020; Alkhateeb, 2020; Kitjaroonchai & Suppasetseree, 2021). In contrast to the findings of Arnold et al. (2012), who observed that learners in structured classes where the teacher provides feedback during collaboration follow a *cooperative* pattern, whereas those who collaborate autonomously follow a *collaborative* pattern during their editing process. It should be noted that the study conducted by Arnold et al. (2012) only focuses on the text mode of Wiki interaction. This is because their research aimed to investigate how learners contribute to the Wiki in structured and unstructured classes, rather than learners' interaction patterns. The researchers attributed the result to the nature of the teacher intervention, which encouraged individual rather than collaborative editing. However, in the current study, both modes of interaction in GD (text and discussion) were examined to find learners' patterns of interaction based on Storch's criteria (equality and mutuality). Furthermore, teacher was trained on how to intervene; thus, The result suggests that GMCW with teacher intervention assisted learners in engaging in a moderate to high level of mutuality and equality in the three patterns identified; that is, learners who formed a *collaborative* pattern exhibited a high level of mutuality and equality; in addition, three out of four learners exhibited a high and equal level of interaction and

contributions in each group that formed a *collaborative/passive* pattern; nevertheless, one member in each group remained inactive, thus the level of mutuality and equality was modest. In the pattern of *expert/novice*, expert encouragement enabled novices to interact and contribute. However, the novice's level of engagement was lower than that of the expert, resulting in moderate mutuality and equality. While GMCW without teacher intervention led to learners engaging in a low level of equality and mutuality, the majority of group members were passive during this condition. A few students, however, divided the role or task equally without engaging in a discussion. Further discussion of the findings pertaining to the learners' pattern of interaction in the experimental and control conditions is presented in sections 5.3.2.1 and 5.3.2.2.

#### **5.3.2.1 Learners' pattern of interaction in the experimental condition (GMCW with teacher intervention)**

The findings support researchers' claims that teacher intervention is effective in promoting learner participation and collaboration (Woo et al., 2013; Alghasab, 2015). Learners who participated in GMCW with teacher intervention showed a moderate to high level of equality and mutuality. However, the level of equality and mutuality in GMCW small groups with teacher intervention varies by patterns of interaction.

For example, two of the six groups (groups 3 and 5) demonstrated a *collaborative* relationship by not only contributing to the task more frequently and almost equally, but also by making equal contributions to their own text and the texts written by others. This finding supports the findings of previous online studies that found evidence of collaborative behaviours among learners by posting equal amounts of comments and practising similar numbers of revisions in their own and others' texts (Abrams, 2016; Li & Zhu, 2011; Elabdali & Arnold, 2020; Alkhateeb, 2020). Furthermore, learners in this pattern demonstrated a high level of mutual engagement in a collaborative dialogue, allowing them to pool linguistic

resources in order to facilitate the building of knowledge (Storch, 2002; Swain, 2000, 2006; Swain & Watanabe, 2013).

By using language as a tool for mediation, students were able to plan their tasks collaboratively and exchange reciprocal feedback about language use while writing their essays. In this pattern, social commentary permeated the learners' discourse. Similar to other collaborative writing research, FTF (Storch, 2002; Donato, 2004) and on Web 2.0 platforms (Elabdali and Arnold, 2020; Lee, 2010; Alghasab, 2015; Li, 2013), the participants expressed their thanks, greetings, encouragement, apologies and praise. Furthermore, first-person plural pronouns were frequently used, which is consistent with the findings of Storch (2002), Li (2013) and Alghasab (2015). This demonstrated a sense of shared responsibility and a collaborative approach to the activity. Furthermore, their engagement in the text mode was collaborative in nature, involving reading, commenting and debating the content and grammar of each other's writing. This pattern led to learners engaging in collective cognition, which is regarded as one of the most significant outcomes of CL (Swain & Lapkin, 1998; Donato, 1994; Swain, 2000; Kitade, 2008; Storch, 2002). By doing this, students were able to bridge linguistic gaps and gain insights that they could not have gained on their own. It has been observed that the features of collaboration in this pattern are similar to those of the collective group in Donato's (1994) study and to those of the *collaborative* pattern in Storch's (2002) study. Similar patterns of high mutuality and equality have been observed in some online studies (Li & Zhu, 2011; Bradley et al., 2010; Abrams, 2016; Elabdali & Arnold, 2020; Alkhateeb, 2020). The appearance of such a pattern in the experimental condition can be attributed to the teacher's intervention. Based on the analysis of teacher interventions, it was evident that the teacher promoted a dialogic environment among learners by guiding them to understand the importance of interaction and act collaboratively. At interview, learners of this pattern reported that teacher instructions helped them to understand how to

work collaboratively. This finding supports Alghasab's (2015) and Alghasab, Hardman and Handley's (2019) contention that students tend to interact collaboratively when the teacher adopts interventional collaborative behaviours.

The other two groups in the experimental condition (i.e., groups 1 and 6) displayed *collaborative/passive* relationships. Three learners in each group exhibited high levels of equality and mutuality and collaborated similarly to the previous pattern. However, one member of each of these two groups remained passive. For instance, Raid (in Group 1) adopted the role of a *free rider* by doing nothing and depending on others to complete the task. Ibrahim (in Group 6) played the role of a *social loafer*, contributing less than his fair share to the text mode. This finding is not surprising since some studies of collaborative writing via Web 2.0 tools have shown that, even in a collaborative group, some learners remain inactive (Li, 2013; Alkhateeb, 2020). However, in Alkhateeb's (2020) study, the researcher mentioned that task poor management due to teacher absence and technical issues such as learners having difficulty using discussion mode and typing in Arabic while using GD, caused some L2 Arabic learners to be passive in their small groups. However, in the current study, a teacher was present and students received technical training before participating in the study. Furthermore, students' responses in the interview revealed that they enjoyed using GD and found it simple. In Arnold et al.'s (2012) study, where the teacher was present in one class, the researcher also noticed that whether the teacher was present or not, students adopted a *social loafer* and *free rider* role. Alghasab (2015) argued that non-collaborative interventional behaviours by teachers could reduce learners' levels of collaboration. in the current study; however, the teacher was pedagogically trained on how to intervene, and all of his interventions were examined (see Appendix K), and no evidence of non-collaborative behaviour was discovered to explain the results. Also, the interviewees in this pattern said they were able to work together when they followed the teacher's



instructions. They expressed regret for the passive learners in their groups who missed out on chances to learn language skills through collaborative work. One possible explanation for the learners' passivity is that contextual factors, such as teachers' perceived superiority, influenced them. In Ibrahim's case, the behaviour appeared to be shaped by prior classroom experiences, where learners accustomed to a teacher-centred classroom valued learning from the teacher over peer interaction and learning from peers. Despite the fact that no data on students' classroom practices were collected, which may call the validity of this claim into question, the qualitative analysis revealed that his contributions in text mode were made primarily in response to the teacher's notification. This suggests that he participated to demonstrate to the teacher that he was a good learner, rather than because he valued collaboration with his group members. According to Alghassab (2015), in the culture of Arab learners, teachers' perceived superiority and authority have limited learners' collaboration and have prompted them to work competitively and independently.

The remaining two groups (groups 2 and 4) in the experimental condition formed *expert/novice* patterns. In each group, expert students took on more responsibility for the task and encouraged the other novice students to interact with and participate in the process. This pattern has been observed in FTF collaborative writing studies (e.g., Storch, 2002) as well as in online studies using GD (e.g., Kitjaroonchai & Suppasetserree, 2021) and Wikis (Li & Zhu, 2011). Even though learners who assumed the role of experts contributed more than novices in this pattern (as shown by quantitative analysis), novices were not passive; they contributed significantly to both modes of interaction. Moreover, the qualitative analysis of the learners' extracts revealed that learners who acted as experts did not impose their opinions on novices. Instead, they encouraged them to participate and sought agreement on how to organise the activity and resolve language issues. According to interview data, the novice in Group 4 (Firas) admitted that his friends in the group did not force him to make changes, but rather

presented options with justifications. According to him, their advice was useful and correct, which enabled him to improve his writing. In addition, analysing learners' discourse in this pattern revealed that experts provided unidirectional assistance through requests, encouragements and overt agreements. It was evident that experts stimulated novices' responses by providing proleptic feedback in which a hint, rather than the correct answer, was provided (Donato, 1988; Storch, 2002). While experts controlled the activity and involved novices in interaction and decision-making, the novices appeared to accept and acknowledge the experts' leadership, and they frequently sought clarification and feedback from the experts because they assumed assistance was readily available. These types of assistance, as well as how experts and novices behave in the *expert/novice* pattern, have been documented in studies conducted by Storch (2002) and Li and Zhu (2011). For example, Li and Zhu (2011), in the authoritative/responsive pattern, which closely resembles the *expert/novice* pattern, the authoritative learners took the lead and offered a variety of assistance to the responsive learners, while the responsive learners accepted the expert's authority. In addition, the current study's findings are in line with those found in Storch's (2002), Li and Zhu's (2011), and Kitjaroonchai and Suppasetseree's (2021) studies, which show scaffolding by pooling other sources of knowledge and the use of first-person plural pronouns in such relationships. According to Storch (2002), *collaborative* and *expert/novice* patterns of interaction are the most conducive to language learning, so finding the *expert/novice* pattern in GMCW with teacher intervention is not surprising.

To summarise, despite the teacher's intervention, learners followed different patterns of interaction when asked to collaborate in the current study; however, participating in GMCW with teacher intervention resulted in three types of interaction: *collaborative*, *collaborative/passive* and *expert/novice*. This means that no non-collaborative patterns, such as *cooperative* or *dominant/passive*, were not observed among the small groups of the

experimental condition. Even though some learners in the *collaborative/passive* pattern adopted non-collaborative roles (i.e., passive), the number of these learners was relatively small (one learner each in groups 1 and 6), which had no negative impact on other members' collaboration as the three learners in each group demonstrated a high degree of mutuality and equality. This finding is consistent with the findings of Alghassab (2015), who found that teachers can encourage learners' collaboration and assist them in engaging in collaborative dialogue, allowing them to participate in collective scaffolding that helps to bridge their linguistic gaps and co-construction of knowledge that exceeds their individual capabilities. However, in Alghassab's (2015) study, the effect of teacher intervention on learners' mutuality during a collaborative Wiki-written task was investigated. While this study showed that teacher intervention influences not only the degree of mutuality but also the degree of equality in learner collaboration.

#### **5.3.2.2 Learners' pattern of interaction in control condition (GMCW without teacher intervention)**

The analysis of learners' interaction patterns in GMCW without teacher intervention confirmed the assumption that the experimental condition's findings were the result of teacher intervention. As discussed in Chapter 4, unlike learners in the experimental condition, learners in the control condition demonstrated a low level of mutuality and equality. There was a *cooperative/passive* pattern of interaction in all small groups, with a few learners cooperating by dividing tasks or roles and many remaining passive. This finding is consistent with those of SLA researchers (e.g., Donato, 1988, 1994; Storch, 2002; Li & Zhu, 2011; Bradley et al., 2010; Abrams, 2016; Elabdali & Arnold, 2020; Alkhateeb, 2020; Kitjaroonchai & Suppasetseree, 2021), which argue that collaboration does not always occur among learners' groups and that simply assigning students to groups does not necessarily create the conditions for effective collaboration. The present study suggests that putting

learners in groups and providing them with advanced collaborative platforms (i.e., GD) did not lead to collaboration.

While all small groups in GMCW with teacher intervention demonstrated a moderate to high level of mutuality, all small groups in GMCW without teacher intervention avoided interaction in the discussion mode. Although a few learners contributed to the discussion by posting a few comments, these comments did not lead to what Swain (2000) referred to as ‘collaborative dialogue’ because the majority of these comments were not reciprocated by others. Furthermore, in their discussions, learners demonstrated some non-collaborative behaviours, such as refusing to accept others’ suggestions, adopting the tone of authority figures by using negative terms such as ‘no’ or ‘not’, and employing second-person plural pronouns (e.g., you) with modal verbs such as ‘should’ and ‘have’, indicating that each learner attempted to exert control over the task. Individual attitudes toward the task were also observed by using phrases such as ‘your part’ and ‘your conclusion’. All of these behaviours ran counter to the definition of high mutual interaction. Collaboration entails learners’ mutual interaction by engaging in a collaborative dialogue that involves pooling each other’s knowledge resources in order to solve any problems that arise in the task, and collectively scaffolding each other in constructing new knowledge (Swain, 2000, 2006; Storch, 2002, 2013, 2019a; Swain & Watanabe, 2013). This finding substantiates Alghasab’s (2015) result in which learners in some groups showed a low level of mutuality and behaved in a non-collaborative manner during their discussion. while Alghasab attributed this finding to the non-interventional collaborative behaviour of the teachers, in the current study, the absence of teacher intervention is an obvious explanation for the low level of mutuality in the control condition. According to interview data, students in this condition were unable to engage in effective interaction due to a lack of motivation and ineffective group management. They

believed that teachers' interventions were required to help them in interacting and writing collaboratively because it was difficult for them to interact and write simultaneously.

Although learners who contributed to the task in all small groups in the control condition demonstrated almost equal contributions to the text mode, the qualitative analysis revealed that they worked cooperatively to complete the task, either by dividing the essay into separate subsections (i.e., introduction, paragraphs or conclusion) or by adopting different roles (i.e., writer or editor). For example, in groups 2 and 3, there was a clear division of labour without engaging in each other's writing. In contrast to the experimental condition, in which learners contributed to each other's writing by not only editing the text based on group discussions but also accepting and incorporating each other's suggestions into the final text, learners in these two groups edited their own texts and did not engage with each other's contributions. The quantitative data in this study supports the qualitative analysis, as learners in these two groups self-reviewed at a rate of 70% or higher of their total revision behaviours, similar to Arnold et al.'s (2012) finding, in which learners in the *cooperative* pattern edited their own text 61% more than editing each other's text. Storch (2002), Tan et al. (2010), Alkhateeb (2020) and Alghasab (2015) have also observed the students cooperating by dividing the task without editing or building on each other's writing. In line with Al Ajmi and Ali (2014), learners in Group 2 favour and prefer division of labour since it alleviates the stress caused by individual writing (as declared by Khaled in the interview). Similar to Thai EFL learners in McDonough's (2004), Spanish learners in Dabao and Blum's (2013), and Kuwaiti EFL learners in Alghasab's (2015) studies, this study suggests that Saudi EFL learners' sociocultural beliefs limited their engagement with one another's contributions, as Abdallah from Group 3 stated in the interview that he intentionally avoided editing and providing criticism because he did not want to engage in conflict with his friends.

In line with Rouhshad and Storch's (2016) and Kost's (2011) findings, the division of labour into groups 4, 5 and 1 was in terms of roles. One learner in each group wrote the entire essay, and one learner assumed the role of editor. As in Rouhshad and Storch's (2016) study, the editing made by the editor in groups 4 and 5 appears to have been accepted by the writer, as the final text incorporated the editor's suggestions. However, no visible engagement has been observed between them. In contrast, the author and editor in Group 1 were unwilling to consider each other's contributions. Their conflict became apparent when they deleted each other's contributions. The author tried to dominate the task, but the editor resisted. As some previous studies observed (e.g., Storch, 2002; Alghasab, 2015), learners generally refuse each other's edits in a *cooperative* pattern. The interview with the writer in this group (Hagia) provides two explanations that illustrate this behaviour: (1) the writer in this group may hold psychological ownership of the text because he stated that he preferred to write alone; and, (2) he may believe that the teacher is the most reliable source of knowledge because he stated that he did not trust his friend's editing and valued teacher feedback over peer feedback. This finding is compatible with the findings of McDonough (2004), Strobl (2014), Arnold et al. (2012), Lee (2010), Alghasab (2015), Abahussain (2020) and Storch (2005), in which they reported that factors that are shaped by previous educational experiences, such as perceiving writing as an individual activity and viewing the teacher as the most trustworthy source of knowledge, hinder learners' collaboration.

In contrast to the experimental condition, in which only two students assumed a passive role, the majority of students in the control condition assumed a passive role. There were some learners in each small group in the control condition who did not contribute to the task, similar to Kessler and Bikowski's (2010) finding that more than half of the participants were reluctant to contribute. In their study, large size of group contributed to the result, while in this study, the absence of a teacher may account for the large number of passive students in

the control group. Alghasab (2015) argues that all authoritative and non-authoritative teacher interventional behaviours are effective at encouraging student participation. The interview data supports Alghasab's (2015) argument, as many interviewees stated that their high level of reluctance to participate in their groups was due to the absence of the teacher.

To recap, students participating in GMCW without teacher intervention engaged in a *cooperative/passive* pattern of interaction. This means that they exhibited a low level of equality and mutuality. Despite the fact that some learners contributed to the task, they did not engage in mutual interaction. Furthermore, most learners were passive, contributing nothing to task. This finding is consistent with some online research findings that learners did not engage with each other's contributions (Bradley et al., 2010; Elabdali & Arnold, 2020; Alkhateeb, 2020; Alghasab, 2015; Li & Zhu, 2011; Abrams, 2016), and some learners are reluctant to contribute (Arnold et al., 2012; Kessler, 2009; Kessler & Bikowski, 2010; Alkhateeb, 2020; Bradley et al., 2010; Abrams, 2016; Elabdali & Arnold, 2020).

## **5.4 Learners' outcomes**

The present study focused on the impact of collaboration on learners' writing outcomes. While the first research question focused on whether there were any significant differences between those who collaborated through GMCW with and without teacher intervention, the third research question concerned whether the differences in learners' patterns of interaction result in different outcomes. The results of the first question indicated that, while both experimental and control learners improved their writing outcomes, those in the experimental condition (GMCW with teacher intervention) improved significantly more than those in the control condition (GMCW without teacher intervention). The fact that learners were exposed to a series of collaborative writing tasks during the intervention could be viewed as a possible explanation for the improvement in both conditions. Interestingly, this finding supports the

argument made by Swain and Lapkin (2001) as well as Storch (2011, 2013, 2018), which asserts that exposing students to several collaborative writing activities impacts their writing outcomes significantly. Previous longitudinal studies, such as those by Shehadeh (2011) and Bikowski & Vithanage (2016), provide evidence that participating in several collaborative writing activities leads to better writing outcomes in subsequent individual tasks. Conversely, studies that involved learners in only a few activities or a single collaborative activity, such as those by Kuiken & Vedder (2002) and Nassaji & Tian (2010), showed no impact of collaboration on learners' writing outcomes. Therefore, it could be argued that in this study, students' involvement in collaboratively writing essays three times in both conditions improved their writing abilities and increased their success in subsequent individual performances.

However, the results suggest there is a significant difference between the two conditions. The experimental groups demonstrated significant improvements in writing compared to the control groups. Returning to SCT, the fundamental assumption is that collaboration with others is conducive to language learning, and that the high level of learners' mutual and equal engagement during collaboration not only allows learners to engage in collective scaffolding, but also to co-construct new knowledge that, once internalised, enables them to perform the task independently in the future. (Donato, 1988; 1994; Storch, 2002). The result seems to align with the SCT perspective; as a result of their teacher's intervention, learners' level of collaboration in the experimental condition was higher than learners' level of collaboration in the control condition. Based on this, it can be concluded that the moderate to high levels of mutuality and equality shown by learners in the experimental condition during their collaboration enabled them to improve their writing outcomes more than those in the control condition. This finding confirms Storch's (2013) and Elabdali's (2021) claims that the



outcomes of collaborative writing activities in subsequent individual performance are dependent on the degree of collaboration among learners during the writing process.

#### **5.4.1 The outcomes of the learners and their patterns of interaction**

The results suggest that learners' patterns of interaction were strongly associated with the outcomes of their subsequent individual writing performances. In this study, of the four patterns that emerged (i.e., *collaborative*, *collaborative/passive*, *expert/novice* and *cooperative/passive*), learners in the *collaborative* pattern obtained higher mean scores, followed by learners showing an *expert/novice* relationship. These results substantiate those of Storch (2002), who observed signs of language acquisition in these two patterns in the FTF context. It has also been found in online studies that learners who write in a *collaborative* manner (Abrams, 2019; Strobl, 2014; Elola & Oskoz, 2010; Kuteeva, 2011; Li & Zhu, 2017) and in an *expert/novice* pattern (Li & Zhu, 2017; Elabdali & Arnold, 2020) produced high-quality joint essays; however, as discussed in section 2.6.3, joint texts cannot be regarded as reliable evidence of language learning. Therefore, the current study has contributed to the literature by demonstrating that even in the online context, *collaborative* and *expert/novice* patterns contribute more to language learning in subsequent performance than any other patterns.

While learners who engaged in a *collaborative/passive* pattern improved their mean scores more than the pattern found in the control condition (i.e., *cooperative/passive*), the *collaborative/passive* pattern improved the least among the other patterns in the experimental condition. Although most learners demonstrated a high level of mutuality and equality, the presence of two passive learners may explain why this pattern has the lowest mean score when compared to *collaborative* and *expert/novice* patterns.

The *cooperative/passive* pattern had the lowest mean scores of the four patterns identified. As mentioned in section 2.3, the cooperative method of completing a joint task contradicts the collaborative philosophy because it does not promote effective interaction between learners that results in the pooling of their linguistic knowledge, allowing them to scaffold one another and create knowledge that will allow them to complete a similar task independently in the future. Furthermore, having many passive learners in this pattern is also viewed as a factor that negatively affects progression. This finding is in line with Storch's (2002) claim that *cooperative* patterns and *passive* roles in collaboration did not lead to effective language-learning advancement.

#### **5.4.2 Learners' attitudes**

Students' attitudes toward GMCW activities with and without teacher intervention were compared in order to obtain a clearer understanding of what influences students' collaboration and outcomes. Two important factors determined learners' attitudes toward the GMCW activity: (1) learners' perception about whether GMCW activities fosters L2 learning or not, and (2) learners' perception about the importance of teacher intervention during collaboration process. This section provides a detailed discussion of each factor, drawing on the results of previous studies.

#### **5.4.3 GMCW activities foster L2 learning**

The findings on learners' attitudes support Storch's (2013) claim that learners' beliefs about language learning are responsible for shaping their perceptions and experiences of a particular language-learning activity. similar to previous research (Strobl, 2014; Alghasab, 2015; Arnold et al., 2012; Lee, 2010; Al Ajmi & Ali, 2014; McDonough, 2004; Dabao & Blum, 2013; Zhai, 2021; Storch, 2005; Abahussain, 2020), this study found that learners' positive and negative perceptions towards the GMCW activity were associated with their

language-learning beliefs. However, prior language-learning experience in the control condition and teacher interventions in the experimental condition influenced learners' language beliefs in the current study. Learners who participated in GMCW with teacher intervention, for example, have positive perceptions toward GMCW activities. They were eager to collaborate and engaged in high levels of mutual interaction, which allowed them to pool each other's linguistic and grammatical resources and receive and provide feedback on each other's contributions. This is because they believed the GMCW activities would provide them with opportunity to learn English through interaction. The teacher's instructions during his intervention appeared to shape learners' beliefs about language learning. It was evident in student responses that they realised the potential positive impact of collaboration and interaction in learning language because of their teacher's intervention. For example, Ameen in Group 1 stated "I did not think I could collaborate and interact with my friends at first, but after the teacher advised us that we could benefit from each other if we interacted and collaborated, I realised that those who participated seriously could gain knowledge and improve their language abilities". Bader in Group 3 also mentioned that teacher intervention helped them recognise the significance of interaction in language learning: "Without the teacher's intervention, I believe we would not understand the importance of interaction in language learning or what it means to collaborate".

On the other hand, learners who participated in GMCW without teacher intervention demonstrated negative attitudes that limited their collaboration. Learners were dissatisfied with collaborative work. They took an individualistic approach to writing the joint essay. This is because their language-learning beliefs are influenced by sociocultural beliefs, prior language-learning experiences, and a lack of confidence in their language abilities. In line with the findings of Al Ajmi and Ali (2014) with EFL Omani learners and McDonough (2004) with Thai EFL students, Saudi learners in the current study had difficulty accepting

collaborative activities because they believed this type of activity did not facilitate the acquisition of grammar rules. This belief is influenced by learners' prior language-learning experiences, in which they were exposed to traditional grammar-based approaches. Students stated that they used to practise grammar drills during writing class, which they thought was beneficial to their language learning.

Furthermore, the interview data revealed that some learners seemed to perceive writing as an individual activity, which also influenced their language-learning beliefs. According to the findings of FTF studies (Abahussain, 2020; Storch, 2005) and online studies (Strobl, 2014; Arnold et al., 2012; Lee, 2010; Alghasab, 2015), focusing on individual achievement assessments and solitary writing activities in the classroom results in students' perceptions of writing as a solitary activity and negatively affects their attitudes toward collaborative writing. Rasheed's responses in Group 5 demonstrated this, as he stated that writing essays individually as homework is beneficial for improving writing skills. The response of Rasheed also revealed that a low level of confidence in the learners' language skills was another factor that led most of the members in his group to be passive and rely on one person for completing the task. He commented, "Because we all thought our friend was better than us (he is referring to the writer), we let him write the essay. I edited my friend's writing just because I wanted to do something. To be honest I was not confident about my editing". This finding is consistent with those of Storch (2005), Abahussain (2020), Lee (2010) and Zhai (2021), who found that learners' lack of confidence in language proficiency is an influential factor that may influence not only learners' attitudes toward collaborative work, but also their level of collaboration.

Furthermore, sociocultural beliefs play an extremely crucial role in shaping learners' language beliefs and impeding their collaboration. Some interviewees, for example, stated that they avoided correcting another student's grammatical errors in order to avoid conflict.

This finding concurs with McDonough's (2004), Dabao and Blum's (2013), Abahussain's (2020), Lee's (2010) and Alghasab's (2015) findings that maintaining relationships has a negative impact on students' attitudes and limits their collaboration. Another cultural issue that influences learners' beliefs and collaboration was seeing the teacher as a superior figure with the authority to make corrections. This factor has been identified in previous studies as one of the barriers to learner collaboration (McDonough, 2004; Lee, 2010; Arnold et al., 2012; Alghasab, 2015). In the current study, some students in control condition did not value their classmates' feedback and believed the teacher was the most reliable source of information.

#### **5.4.3.1 Teacher's intervention is essential in collaborative activities**

Participants in the experimental condition were asked about their perceptions of the effectiveness of teacher intervention. All the interviewees, regardless of their pattern of interaction, held positive attitudes toward teachers. They believed that teachers not only promote their participation but also assist them in collaborating effectively. Similar to Kuwaiti EFL students in Alghasab's (2015) study, Saudi EFL students valued the teacher's intervention, believing collaboration would not occur without it.

Even though learners in the control condition were not asked about their perception of teacher intervention, the interviewees expressed the opinion that a lack of teacher motivation and guidance resulted in ineffective group management, as well as reluctance to participate. This finding supports Rouhshad and Storch's (2016) claim, in which they suggested that GD, with its discussion space feature, is an effective collaborative tool when the teacher monitors the task. As mentioned in section 3, the teacher gave learners in the control condition explicit instructions on how to collaborate prior to beginning the activity. They believed, however, that it was difficult for them to collaborate effectively and suggested that the teacher should intervene to assist students and manage their collaboration process. This finding agrees with

Alkhateeb's (2020) suggestion, in which he advocated for teacher intervention to monitor task progress, as his participants (learners of Arabic) stated that poor task management limited their participation.

## 5.5 Summary

This chapter presented the key findings of the study and discusses them in light of relevant previous research on collaborative writing in FTF and online contexts. The findings of the impact of GMCW with and without teacher intervention were compared and discussed in relation to the three factors tested (collaboration process, outcomes and attitudes).

Generally, the findings supported Storch's (2002, 2013) claim that the improvement in learners' collaborative writing outcomes was related to their level of collaboration during the intervention. By comparing the learners' collaboration processes under the two conditions, it was evident that GMCW with teacher intervention promoted learners' collaboration, in which they effectively used text and discussion modes. Those students demonstrated high to moderate levels of mutuality and equality by adopting *collaborative*, *collaborative/passive* and *expert/novice* patterns, which influenced their outcomes and attitudes positively. Learners who collaborated with their teacher performed significantly better in subsequent individual performances than those who did not collaborate with their teacher. This was because learners in the experimental conditions had the opportunity to engage in collaborative dialogue with their teachers, which allowed them to build each other's ideas and construct new knowledge that would help them become more independent in the future. Furthermore, they developed a positive attitude toward collaborative activities as a result of teacher intervention during their collaborations, which influenced their language-learning beliefs, shaped their attitudes, and assisted them in adopting a collaborative approach.

This study also emphasised that simply providing learners with an advanced collaboration tool like GD did not promote their collaboration. Students in the control condition were unable to participate in discussion without the intervention of their teacher, and when contributing to the text mode, they cooperated rather than collaborated, with a higher proportion of students taking a passive role. Students in this condition improved their performance, but this could be attributed to the multiple collaborative tasks they completed during the intervention. Learners viewed collaborative activities negatively because they believed that interaction during collaboration would not result in L2 learning. Furthermore, in the absence of teacher intervention, a lack of motivation and poor group management contributed to their negative attitudes toward collaboration.

## **Chapter 6 Conclusion**

### **6.1 Overview**

The purpose of this study was to investigate the impact of EFL teachers' interventions in GMCW activities on students' writing outcomes. According to research on Web 2.0-based collaborative writing in language learning, teachers can increase students' levels of collaboration by intervening in a collaborative and non-threatening manner (e.g., Arnold et al., 2012; Alghasab, 2015; Woo et al., 2013). They argue that teacher support contributes to fostering student ownership of the text, ensuring equality and promoting mutuality among students. There is, however, no evidence that teacher intervention influences or contributes to students' language learning and their writing outcomes. To investigate this issue, the following research questions were developed:

1. Will Saudi university EFL students who are engaged in GMCW with teacher intervention improve their writing outcomes in subsequent individual performance more than those who are engaged in GMCW without teacher intervention?
2. To what extent do Saudi EFL students collaborate when they engage in GMCW with teacher intervention, compared with those who collaborate in GMCW without teacher intervention?
3. Do differences in learners' patterns of interaction result in different writing outcomes?
4. What are students' perceptions of GMCW in the groups that have teacher intervention, compared to the groups that do not have such intervention?



## **6.2 Methodological and theoretical contributions**

As a means of answering these research questions, a mixed-methods approach to data analysis was used, considering not only learners' outcomes but also their levels of collaboration and their attitudes. This broader approach to analysis strengthened the reliability and validity of the research findings and provides an in-depth understanding of the impact of GMCW with teacher intervention on the improvement of learners' writing skills. Therefore, the assessment of learners' levels of collaboration through an analysis of their collaboration processes and attitudes provides evidence that learners' outcomes are determined by the degree to which they collaborate and the degree to which they adopt a collaborative approach to the activity. Arguably, if only learners' outcomes had been analysed, the picture of the impact of GMCW with teacher intervention on learners' writing outcomes would have been incomplete. Another strength of the study was the quantitative and qualitative analysis of the students' collaboration process by using GD archives that included both discussion and text modes of interaction. In addition to revealing how many times the students engaged in various forms of interaction (discussion and text) to determine the level of equality among students, this distinctive method of analysis was used to qualitatively analyses the students' extracts in order to gain the most accurate insight into the degree of mutual collaboration among students.

Using this analytical approach, the main findings in relation to the three aspects examined in the current study (collaboration process, attitudes, and outcomes) contribute to the study's theoretical framework by implying that: (1) Students' collaboration cannot be guaranteed simply by asking them to participate in a collaborative writing activity or by providing advanced collaborative tools; rather, students' collaboration is promoted through the teacher's intervention. It is not the technology (GD) or the activity (collaborative writing) that is truly important; this is not intended to diminish the value of collaborative writing activities

or the efficacy of integrating technology into collaborative writing activities, but rather to raise awareness of the importance of teachers' roles in using technology-mediated collaborative writing to encourage student interaction. As evident in this study, although all students, receiving the same training (taught by a single teacher), participating in a similar GMCW activity, and receiving similar explicit instruction on how to collaborate before participating in each activity, the results of this study demonstrated that, overall, students participating in GMCW with teacher intervention collaborated better than students participating in GMCW without teacher intervention. As a result of the analysis based on Storch's (2002) criteria of mutuality and equality, learners engaged in GMCW with teacher intervention demonstrated patterns of interaction conducive to learning, including *collaborative* and *expert/novice* interactions, with only two learners acting as passive participants. In contrast, those who engaged in GMCW without teacher intervention displayed a non-collaborative pattern (i.e., a *cooperative/passive* pattern). Finding in relation to learners' outcomes also adds to the study's theoretical framework, indicating that GMCW with teacher intervention influences learners' outcomes. It proposed that: (2) By encouraging collaboration through teacher intervention, students in the experimental group significantly improved their writing outcomes. While learners in both conditions improved their outcomes, the results indicated that the outcomes of learners in the experimental condition (GMCW with teacher intervention) were significantly better than those of learners in the control condition (GMCW without teacher intervention). (3) The results of the analyses of learners' outcomes based on their patterns confirm previous findings that the *collaborative* and *expert/novice* patterns are most conducive to learning. It was found that learners who engaged in these two patterns of interaction improved their outcomes more than those who engaged in other patterns of interaction. (4) The teacher's intervention also affected students' attitudes toward the GMCW activity. Teacher intervention led to a positive perception of the activity

in the experimental condition due to its impact on learners' language beliefs, while those in the control condition had negative attitudes and maintained their prior language-learning beliefs.

### **6.3 Limitations of the study**

The present study has a number of limitations that should be acknowledged. To begin with, due to Saudi culture and religious beliefs, all participants were male; a mixed gender sample would have illuminated a broader range of issues. In addition, the study examined the effects of GMCW with and without teacher intervention in particular classrooms at Al Qassem Saudi University; therefore, there was no attempt to generalise beyond these classroom participants. An in-depth description of the findings might enhance their transferability to other contexts with similar characteristics. Another noteworthy limitation is that the study design cannot be classified as a truly experimental design due to the employment of convenience sampling for participant selection strategies. In the context of Saudi universities, the researcher faced institutional constraints that prevented the random assignment of participants to control and experimental conditions. Consequently, a sampling approach based on convenience was utilised to collect data for the study, as elaborated in section 3.4. This particular limitation has implications for the generalizability of the results beyond the specific groups involved in the study and the ability to establish causality. Further limitation was that data of the learners' collaboration process were obtained from analysing only one task out of three. Nevertheless, avoiding analysing the other two tasks was justified in section 3.8.1.2.2. A nother limitation of the study was that not all participants were interviewed. Since there are a large number of participants and a limited amount of time, the teacher instructed each small group in the experimental and control conditions to select one student to speak on behalf of the group.

Nonetheless, the findings from these participants provided useful insights into the perceptions of learners and the factors underlying their beliefs.

## **6.4 Pedagogical implications**

In addition to the theoretical and methodological contributions discussed in section 6.2, this study suggests some pedagogical implications for enhancing the effectiveness of online collaborative writing activities. Among these implications are the incorporation of collaborative writing into classroom culture and assessment practices, the importance of teacher intervention during the collaborative process as well as the formation of groups.

### **6.4.1 Incorporating collaborative writing into classroom culture and assessment practices**

A collaborative writing activity should be incorporated into the classroom's culture before being implemented. It is essential to provide a clear understanding of what collaboration means and how collaborative writing can benefit students. It is important for teachers to explain to students that collaborating gives them a chance to learn from others and to acquire new knowledge. One of the most important findings in this study is that teacher instruction during his intervention influences learners' language beliefs, which in turn helps them to adopt a collaborative approach to the activity. This study suggests that learners' language beliefs may be influenced by advice from teachers; however, such advice may not be enough to overcome the influence of students' prior experiences in the classroom.

Several studies conducted in FTF and online contexts show that classroom practices, such as individualised assessments of students' achievement and the practice of solitary writing hinder learners' collaboration. (Abahussain, 2020; Storch, 2005; Strobl, 2014; Arnold et al., 2012; Lee, 2010; Alghasab, 2015). Similarly, learners in the control condition in this study admitted that despite receiving explicit instructions from the teacher on how to collaborate,

they did not collaborate effectively due to their beliefs that writing is a solitary activity. In light of this, teachers are advised to re-evaluate their classroom teaching and assessment methods. Rather than focusing on individual effort, assessment should include collaborative efforts as well. In addition, the fact that some students in this study, even with a teacher present, adopted the roles of *free rider* and *social loafer* suggests that both the product and the process should be evaluated. Students should be evaluated based on their mutuality and equality to the collaborative activity, as this will enable teachers to enhance both their final product and promote language learning between students. As a means of improving the learning process, teachers are also encouraged to intervene during the collaboration process.

#### **6.4.2 Teacher interventions**

According to the study's findings, teacher intervention is effective in enhancing the process of language learning. A teacher's explicit instruction prior to the activity in the control groups did not have the same effect as his intervention in the experimental groups. Although in this study engaging learners in GMCW activities with and without teacher intervention contributed to improvement in language learning (as both learners in experimental and control conditions improved their writing outcomes in subsequent individual performance), those who engaged in GMCW with teacher intervention improved their writing outcomes significantly better than those who collaborated without teacher intervention. As a result, teachers should intervene by mediating the activity to facilitate learners' collaboration and learning process, rather than restricting their role by providing explicit instruction prior to the activity (Rojas-Drummond & Mercer, 2003; Alghasab, 2015; Webb, 2009; Yoon & Kim, 2012). During their intervention, teachers are advised to urge students to adopt *collaborative* patterns and avoid non-collaborative ones. From an SCT point of view, teachers should intervene gradually and conditionally so that students are able to assume responsibility for their own learning. Afterwards, they can intervene based on the students' progress and needs.

In order to promote collaboration among learners, teachers are also advised to stimulate students' answers rather than simply answering their questions. To elicit responses from students, teachers should provide hints or seek assistance from other students.

It is also advisable for teachers to intervene in a non-authoritative manner to encourage students' participation in activities. Students in this study preferred teacher intervention in the GMCW. Students in the experimental condition valued teacher instructions and acknowledged the role of his encouragement in motivating them to collaborate, whereas students in the control condition admitted that the lack of teacher intervention left them demotivated to collaborate and reluctant to participate. As a result, teachers should intervene in a motivating manner to encourage students to participate in the activity. Teachers' behaviours, such as posting positive feedback and praising students' efforts, can play an influential role in motivating students' collaboration; however, this praise should be directed toward the entire group rather than individuals to avoid creating a competitive environment among learners. The teacher can foster a friendly environment for students by encouraging collaborative efforts, which may lead to a *collaborative* pattern rather than a *cooperative* one. Nevertheless, in order to assist students in engaging in *collaborative* patterns, the way in which groups are formed should be considered by the teacher.

### **6.4.3 Group formation**

It is important for teachers to consider how to form groups in a way that fosters collaboration before asking students to collaborate. In the formation of groups, there is the issue of whether the teacher should form the group or if students should have the opportunity to self-select. Self-selection occurs when learners choose an individual with whom they are familiar, allowing them to feel comfortable challenging each other's ideas (Storch, 2002, 2005, 2013). It is important to note, however, that the study did not examine the effects of group formation

conditions on student collaboration, nor was the research outcome sufficient to provide reliable recommendations on this topic. Students in this study were given the option of selecting their group members; however, not all students were collaborative; instances of *free rider* and *social loafer* behaviour were observed in the experimental group despite the presence of the teacher. In addition, learners in control groups were more likely to cooperate than collaborate, and the majority were passive. Furthermore, the findings indicated that learners in the control condition did not feel comfortable contributing to each other's contributions when they formed groups by themselves. In the interview, students admitted that, despite being aware of others' errors, they did not correct them to avoid conflict. From an SCT perspective, individuals with higher levels of experience can scaffold and develop the skills of individuals with lower levels of experience. Thus, teachers are advised to consider learners' language proficiency when forming small groups in a Web 2.0-based collaborative activity.

## **6.5 Future research**

This study examined how GMCW and teacher's online interventions affected students' writing outcomes. However, even though the study addressed some gaps in the collaborative writing literature, the results of this study suggest there are still a number of other aspects and issues that need to be addressed. The following are some suggested directions for future researchers who wish to explore the impact of GMCW combined with teacher intervention on learners' writing abilities.

The current study's findings suggest a link between improved writing outcomes for students and teacher intervention in GMCW. Future research is needed to determine the extent to which teacher intervention in FTF collaborative writing affects learner outcomes. This could be investigated through comparative design studies, such as dividing students into two

groups. One group could participate in online collaborative writing with teacher intervention while the other participates in FTF collaborative writing with teacher intervention, and the level of learners' improvement in writing outcomes could be measured.

The study's findings, based on interviews with a small number of students, show that traditional classroom practices influence students' language beliefs, which in turn influence their level of collaboration; however, teacher intervention during learners' collaboration influences their language beliefs positively. As a result, future researchers may wish to look deeper into how teacher intervention during learner collaboration affects their language beliefs.

The study also indicated that learners who engaged in GMCW with teacher intervention followed different patterns of interaction. Future researchers could examine learners' and teachers' attitudes and collect observational data from teachers and students to better understand why different patterns emerge.



## Appendices

### Appendix A: Essay's topics (pre-test and post-test)

Write an essay in English about the following topics. You will have only 40 minutes to finish the composition.

#### **Version (A)**

*“Some experts believe that it is better for children to begin learning English language at primary school rather than secondary school. To what extent do you agree with this statement? Give reasons and examples to support your answer?”*

#### **Version (B)**

*“Some people think that it is better for students to learn English language abroad rather than inside Saudi Arabia. To what extent do you agree with this statement? Give reasons and examples to support your answer?”*

## **Appendix B: Teacher's technical training lesson plan**

### ***Objectives:***

At the end of the technical training hour, the teacher will be able to:

Write on the google doc page.

Suggest changes, addition, and deletion that show up as coloured marks.

Post comments by asking questions, making notice, or highlighting changes.

View revision history by clicking 'Ctrl+Alt+Shift+H'. This step helps the teacher to see all changes that made in google doc.

Insert charts, hyperlinks, and footnotes.

### ***Procedures:***

At the beginning of the session, the teacher will be trained technically how to use GD as shown in the basic tutorial handout in appendix (F).

The second half of the session, the teacher will join GD training activity to practice using GD under the researcher's supervision and the following steps should be adopted:

Creating a Gmail email and logging into the google doc account.

Sending an invitation to engage in a collaborative writing project.

Practising the process of suggesting, editing, adding, deleting, saving documents, and viewing the revision history.

Uploading resources from the internet or the computer.

Sharing the documents with others by either generating a shareable link or sharing through email address.

Shortcut keys that help the teacher to be familiar with google doc (e.g., Ctrl + c; Ctrl + v; Ctrl + x; Ctrl + k; Ctrl + s, etc).

Finally, the researcher will answer to the teacher's technical problems and comments related to google doc.

## **Appendix C: Teacher's intervention training lesson plan**

### ***Objectives:***

Besides training the teacher technically, the teacher will be trained how to intervene with students when they collaborate in their small groups using google doc.

At the end of the intervention training session, the teacher will be able to:

Promote students' collaborations by giving cognitive feedback.

Create a nonthreatening GD environment by adopting social behaviours.

Minimise posts in order to give students the opportunity to interact with one another

### ***Procedures:***

The teacher will be given an intervention handout that shows types of interventions and examples of collaborative and non-collaborative behaviours. The researcher will make sure that the teacher is able to intervene with students using collaborative behaviours.

The teacher should adopt the following steps:

Encouraging students to collaborate with one another in their small groups.

Posting and intervening should be minimised in order to give students the opportunity to interact with one another.

Giving direct answering when students get stuck should be avoided. Alternatively, the teacher should use some strategies that stimulate students' answers such as raising some questions.

Creating a nonthreatening google doc environment by using a less authoritative tone.

Praising students' contributions by posting words of encouragement such as 'great', 'good job' and so forth.

Guiding students how to engage in writing activities such as collecting ideas, brainstorming, planning, and making an outline.

Enhancing joint construction by promoting collaboration among students through on own and others' contribution instead of only writing by themselves.

Providing students with feedback on both sentence structure and content.

## **Appendix D: Students' technical training lesson plan**

There were some objectives and steps that were considered when training the students.

### ***Objectives:***

At the end of the training session, the students will be able to use GD effectively (e.g., creating and logging into Gmail, writing, posting, revising, editing, and reviewing the page history). Similar objectives and procedures as those provided in the teacher's technical training session were adopted for the students' technical GD training session.

### ***Procedures:***

The teacher will train the students how to use GD to ensure that they understand the basic skills of using GD as follow:

The teacher will teach the students the same technical training steps that was presented to him in the teacher's session (see appendix B).

After demonstrating the main steps of technical session, the teacher will show students how to log in to GD.

The teacher will share with students the main basic tutorial handout as shown in appendix (F).

Students and the teachers will join GD training activity that will last for four hours. In every class, students will be divided into google groups and every group will practice writing using GD under the teacher's supervision.

During the activity, the teacher will answer all the students' comments and questions.

## Appendix E: Teacher intervention training handout

Type of Intervention	Explanation	Examples of teacher collaborative behaviour	Examples of teacher non collaborative behaviour
<b>Cognitive interventions</b>	Cognitive intervention means that the teacher should promote students' online interaction by giving form and meaning feedback, and answering learners' language-related questions. However, this intervention should not be through giving direct answers; rather, the teacher should use some strategies such as raising some questions to stimulate answers from students and promote S-S collaboration.	Setting collaborative ground rules. Promoting participation among students. Promoting giving language related feedback. Promoting editing behaviours among learners.	Promoting individual contributions. Giving direct language related feedback. Adopting the editor role.
<b>Social interventions</b>	The purpose of social interventions is to create a nonthreatening GD environment and enhance students' accuracy and fluency. This can be achieved when the teacher intervenes with a less authoritative tone and praises students' contributions by posting words of encouragement such as 'great', 'good job' and so forth.	Greeting students. Encouraging learners' work. Praising students' collaborative behaviours. Talking in a friendly manner to the students.	Talking with authoritative tone. Adopting the monitor role.
<b>Teacher's posts.</b>	The teacher should not post too much in order to give students the opportunity to interact with one another	Giving students space to interact with each other's minimising the teacher's posts. Intervening when it is necessary.	Maximising the teacher's posts.

## Appendix F: How to use Google Docs: Basic tutorial handout

### *How do you create a new Google document?*

From your computer, you need to go to google docs page at (<https://www.google.co.uk/docs/about>) and select (personal) to log in, then click any template to create a new document.

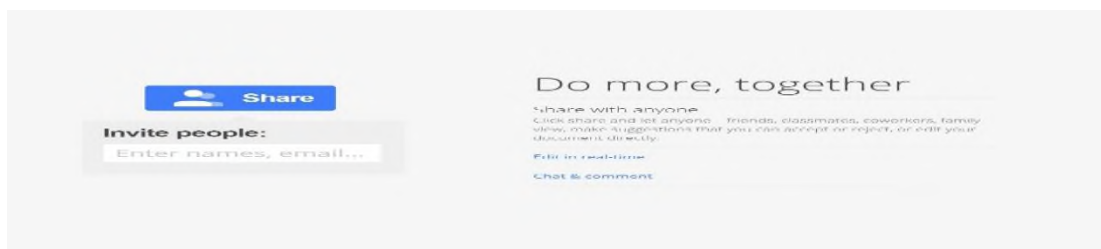
From your mobile, you need to download the google docs app, and then you will get a blank templet to create a new document.

Make sure to give a name for your document at the top of the screen.

The document is saved to your Google Drive automatically.

### *How do you share and collaborate in Google Docs?*

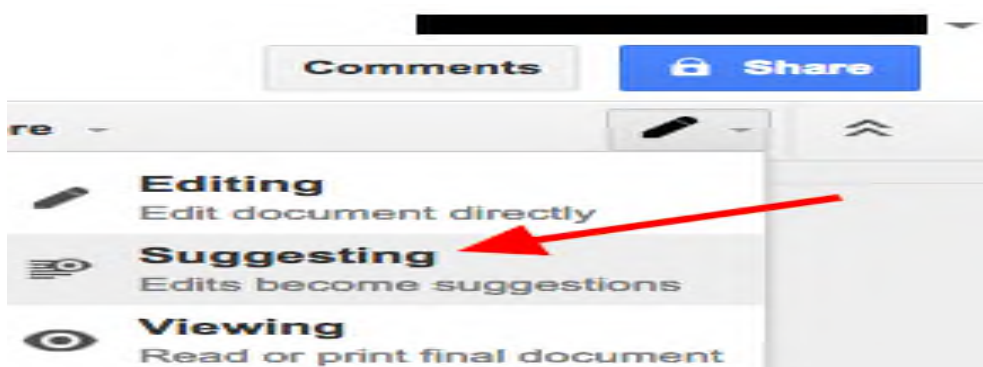
When your document is opened, you need to click on the blue share button as shown in the picture below. Then, you will have the chose either to entire the email the person that you will share directly or send a hyperlink that you can send to the person.



### *How do you use editing and Suggesting Modes?*

From the right side of the page, you can make 'editing' and 'changing' as shown in the picture below. Moreover, you can suggest changes without changing anything in the actual text.

Any changes you make will be shown in coloured marks.



### *How do you leave comments in the document?*

From the top of the screen, there is icon 'Insert' as shown in the picture below. By clicking 'comment', you will be able to do many things (e.g., asking questions, making notes, highlighting changes, leaving comments, editing and deleting comments...etc).



### *How do you access to revision History?*

By clicking **File > View Revision History**, you will be able to see all changes that you or your classmates made.

## Appendix G: Student semi-structured interview schedule

Topic	Interview questions
The use of technology (Google Docs)	<p>How did you feel about writing collaboratively using Google Docs?</p> <p>What is your experience of using Google Docs? Is it easy to use or difficult?</p> <p>Did you face any challenges in using Google Docs? Explain if any.</p>
The interacting in small groups via Google Docs	<p>How did you feel about interacting with your group in Google Docs collaborative writing?</p> <p>Based on your last experience, what were the advantages and the disadvantages of interacting with group via Google Docs?</p> <p>Did you face any challenges during interacting with your group via Google Docs? Explain if any.</p>
The stages of writing process during collaborative writing using Google Docs	<p>During prewriting stage (i.e., brainstorming and planning), do you think that you learn from structure and plan your ideas with your group? Can you explain in some details?</p> <p>During drafting stage, do you feel that you write better collaboratively rather than individually without any help from others? Why?</p> <p>During revising and editing stages, do you feel that working collaboratively via Google Docs help you to overcome your writing difficulties such as correcting grammar mistakes, restructuring ideas and finding right vocabularies?</p>
Concluding question	<p>Do you have anything else about your experience of collaborative writing using Google Docs you would like to add?</p>
Interacting with the teacher via GD*.	<p>How did you feel about interacting with your teacher in Google Docs collaborative writing?</p> <p>Based on your last experience, what were the advantages and the disadvantages of interacting with the teacher via Google Docs?</p> <p>Did you face any challenges during interacting with your teacher via Google Docs? Explain if any.</p>

\*This topic is only for the experimental group.



## Appendix H: Essay-scoring rubric (Paulus, 1999)

	Organization	Development	Cohesion	Structure	Vocabulary	Mechanics
1	No organization evident; ideas random, related to each other but not to task; no paragraphing; no thesis; no unity	No development	Not coherent; no relationship of ideas evident	Attempted simple sentences; serious, recurring, unsystematic grammatical errors obliterate meaning; non-English patterns predominate	Meaning obliterated; extremely limited range; incorrect/unsystematic inflectional, derivational morpheme use; little to no knowledge of appropriate word use regarding meaning and syntax	Little or no command of spelling, punctuation, paragraphing capitalization
2	Suggestion of organization; no clear thesis; ideas listed or numbered, often not in sentence form; no paragraphing/grouping; no unity	Development severely limited; examples random, if given.	Not coherent; ideas random/unconnected; attempt at transitions may be present, but ineffective; few or unclear referential ties; reader is lost.	Uses simple sentences; some attempts at various verb tenses; serious unsystematic errors, occasional clarity; possibly uses coordination; meaning often obliterated; unsuccessful attempts at embedding may be evident.	Meaning severely inhibited; very limited range; relies on repetition of common words; inflectional/derivational morphemes incorrect, unsystematic; very limited command of common words; seldom idiomatic; reader greatly distracted	Some evidence of command of basic mechanical features; error-ridden and unsystematic
3	Some organization; relationship between ideas not evident; attempted thesis, but unclear; no paragraphing/grouping; no hierarchy of ideas; suggestion of unity of ideas	Lacks content at abstract and concrete levels; few examples	Partially coherent; attempt at relationship, relevancy and progression of some ideas, but inconsistent or ineffective; limited use of transitions; relationship within and between ideas unclear/non-existent; may occasionally use appropriate simple referential ties such as coordinating conjunctions.	Meaning not impeded by use of simple sentences, despite errors; attempts at complicated sentences inhibit meaning; possibly uses coordination successfully; embedding may be evident; non-English patterns evident; non-parallel and inconsistent structures.	Meaning inhibited; limited range; some patterns of errors may be evident; limited command of usage; much repetition; reader distracted at time.	Evidence of developing command of basic mechanical features; frequent, unsystematic errors.

	Organization	Development	Cohesion	Structure	Vocabulary	Mechanics
4	Organization present; ideas show grouping; may have general thesis, though not for persuasion; beginning of hierarchy of ideas; lacks overall persuasive focus and unity.	Underdeveloped; lacks concreteness; examples may be inappropriate, too general; may use main points as support for each other.	Partially coherent, main purpose somewhat clear to reader; relationship, relevancy, and progression of ideas may be apparent; may begin to use logical connectors between/within ideas/paragraphs effectively; relationship between/within ideas not evident; personal pronoun references exist, may be clear, but lacks command of demonstrative pronouns and other referential ties; repetition of key vocabulary not used successfully.	Relies on simple structures; limited command of morpho-syntactic system; attempts at embedding may be evident in simple structures without consistent success; non-English patterns evident.	Meaning inhibited by somewhat limited range and variety; often uses inappropriately informal lexical items; systematic errors in morpheme usage; somewhat limited command of word usage; occasionally idiomatic; frequent use of circumlocution; reader distracted.	May have paragraph format; some systematic errors in spelling, capitalization, basic punctuation.

	Organization	Development	Cohesion	Structure	Vocabulary	Mechanics
5	Possible attempted introduction, body, conclusion; obvious, general thesis with some attempt to follow it; ideas grouped appropriately; some persuasive focus, unclear at times; hierarchy of ideas may exist, without reflecting importance; some unity.	Underdeveloped; some sections may have concreteness; some may be supported while others are not; some examples may be appropriate supporting evidence for a persuasive essay, others may be logical fallacies, unsupported generalization	Partially coherent; shows attempt to relate ideas, still ineffective at times; some effective use of logical connectors between/within groups of ideas/paragraphs; command of personal pronoun reference; partial command of demonstratives, deictics, determiners.	Systematic consistent grammatical errors; some successful attempts at complex structures, but limited variety; clause construction occasionally successful, meaning occasionally disrupted by use of complex or non-English patterns; some nonparallel, inconsistent structures.	Meaning occasionally inhibited; some range and variety; morpheme usage generally under control; command awkward or uneven; sometimes informal, unidiomatic, distracting; some use of circumlocution.	Paragraph format evident; basic punctuation, simple spelling, capitalization, formatting under control; systematic errors.
6	Clear introduction, body, conclusion; beginning control over essay format, focused topic sentences; narrowed thesis approaching position statement; some supporting evidence, yet ineffective at times; hierarchy of ideas present without always reflecting idea importance; may digress from topic.	Partially underdeveloped, concreteness present, but inconsistent; logic flaws may be evident; some supporting proof and evidence used to develop thesis; some sections still under supported and generalized.	Basically, coherent in purpose and focus; mostly effective use of logical connectors, used to progress ideas; pronoun references mostly clear; referential/anaphoric reference may be present; command of demonstratives; beginning appropriate use of transitions.	Some variety of complex structures evident, limited pattern of error; meaning usually clear; clause construction and placement somewhat under control; finer distinction in morpho-syntactic system evident; non-English patterns may occasionally inhibit meaning.	Meaning seldom inhibited; adequate range, variety; appropriately academic, formal in lexical choices; successfully avoids the first person; infrequent errors in morpheme usage; beginning to use some idiomatic expressions successfully; general command of usage; rarely distracting.	Basic mechanics under control; sometimes successful attempts at sophistication, such as semi-colons, colons.

	Organization	Development	Cohesion	Structure	Vocabulary	Mechanics
7	Essay format under control; appropriate paragraphing and topic sentences; hierarchy of ideas present; main points include persuasive evidence; position statement/thesis narrowed and directs essay; may occasionally digress from topic; basically unified; follows standard persuasive organizational patterns	Acceptable level of development; concreteness present and somewhat consistent; logic evident, makes sense, mostly adequate supporting proof; may be repetitive	Mostly coherent in persuasive focus and purpose, progression of ideas facilitates reader understanding; successful attempts to use logical connectors, lexical repetition, synonyms, collocation; cohesive devices may still be inconsistent/ ineffective at times; may show creativity; possibly still some irrelevancy	Meaning generally clear; increasing distinctions in morpho-syntactic system; sentence variety evident; frequent successful attempts at complex structures; non-English patterns do not inhibit meaning; parallel and consistent structures used	Meaning not inhibited; adequate range, variety; basically idiomatic; infrequent errors in usage; some attention to style; mistakes rarely distracting; little use of circumlocution	Occasional mistakes in basic mechanics; increasingly successful attempts at sophisticated punctuation; may have systematic spelling errors
8	Definite control of organization; may show some creativity; may attempt implied thesis; content clearly relevant, convincing; unified; sophisticated; uses organizational control to further express ideas; conclusion may serve specific function.	Each point clearly developed with a variety of convincing types of supporting evidence; ideas supported effectively; may show originality in presentation of support; clear logical and persuasive/convincing progression of ideas.	Coherent; clear persuasive purpose and focus; ideas relevant to topic; consistency and sophistication in use of transitions/ referential ties; effective use of lexical repetition, derivations, synonyms; transitional devices appropriate/ effective; cohesive devices used to further the progression of ideas in a manner clearly relevant to the overall meaning.	Manipulates syntax with attention to style; generally error-free sentence variety; meaning clear; non-English patterns rarely evident	Meaning clear; fairly sophisticated range and variety; word usage under control; occasionally unidiomatic; attempts at original, appropriate choices; may use some language nuance.	Uses mechanical devices to further meaning; generally, error-free.

	Organization	Development	Cohesion	Structure	Vocabulary	Mechanics
9	Highly effective organizational pattern for convincing, persuasive essay; unified with clear position statement; content relevant and effective	Well-developed with concrete, logical, appropriate supporting examples, evidence and details; highly effective/convincing; possibly creative use of support	Coherent and convincing to reader; uses transitional devices/referential ties/logical connectors to create and further a particular style	Mostly error-free; frequent success in using language to stylistic advantage; idiomatic syntax; non-English patterns not evident	Meaning clear; sophisticated range, variety; often idiomatic; often original, appropriate choices; may have distinctions in nuance for accuracy, clarity	Uses mechanical devices for stylistic purposes; may be error-free
10	Appropriate native-like standard written English	Appropriate native-like standard written English	Appropriate native-like standard written English	Appropriate native-like standard written English	Appropriate native-like standard written English	Appropriate native-like standard written English

## Appendix I: Piloting the approach to analyse learners' collaboration process

The quantitative and qualitative analyses of students' collaboration process revealed that three learners out of four in the pilot study formed a collaborative pattern of interaction by engaging in various collaborative behaviours, such as seeking and providing feedback, eliciting, justifying in the discussion mode. They jointly co-constructed the online joint text by adding ideas, expanding and editing their own and other's texts. In addition, the analyses showed that these learners not only contributed equally but also shared the authority and responsibility over producing the online joint written task. Only one learner out of four learners in the small group apparently remained inactive and passive with fewer notable contributions to the written text emerging after being called out by the teacher. These findings are discussed below in detail under six main themes, as follows:

The students' level of contribution to the task in both modes of collaboration

The students' level of sharing the decision-making and the authority over the task.

The level of students' mutual cognitive engagement.

The level of students' mutual social engagement.

The students' level of engagement with each other's contributions to the written text.

### A. Students' level of contribution

The researcher quantified learners' contributions in both modes of interactions to get an overview of the degree of equality in learners' collaboration. Table (1) illustrates learners' contributions in the discussion mode, while Table (2) illustrates learners' contributions to the text mode.

**Table (1): Taxonomy of the students' online comments in the discussion mode**

Type of Comments	Type of Collaboration	Shoug	Amani	Lara	Rimas
Planning comments	Organising the task	2	1	1	2
	Initiating the writing activity				
Cognitive comments	Showing agreement or disagreement	7	0	3	4
	Providing and seeking peer feedback	4	0	2	5
	Elaborating	1	0	0	1
	Eliciting	2	0	1	6
	Questions	2	0	1	6
	Justifying	1	0	0	1
	Requesting	2	0	2	1
	Suggesting	2	0	4	5

Social comments	Greeting, acknowledging, and encouraging expressions of emotions: thanking, praising and apologising	5	0	7	12
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**Table (2): Taxonomy of the students' revision behaviour in the text mode**

Writing change functions	Shoug		Amani		Lara		Rimas	
	Self	Other	Self	Other	Self	Other	Self	Other
Deleting	11	7	4	4	6	2	12	6
Adding	20	8	3	8	16	1	28	7
Extending	5	2	0	0	4	2	10	3
Correcting formal errors	11	7	5	2	7	1	8	9

It was obvious from the tables above that the three participants (Shoug, Lara, and Rimas) displayed a high level of contribution to the task in both modes of interactions. According to Table (3.11), all three participants reported high instances of cognitive comments. For example, Shoug posted seven comments that showed agreements and disagreements, two comments to each eliciting, requesting, questions and suggesting. Moreover, she participated four times to provide and seek feedback and one time to justify and elaborate. In addition, Lara contributed collaboratively to the task by adding four suggestions and three agreements. She was also involved twice in providing and seeking feedback and once in each questioning and eliciting. Rimas, who also showed a high level of contributions, included five instances to each providing and seeking feedback and suggestion, six instances to each eliciting and questions, as well as one instance to each justifying, elaborating, and requesting. She also contributed four times to show dis/agreement. The three collaborative learners (Shoug, Lara, Rimas) also exchanged social comments mutually with five, seven, and 12, respectively.

According to Table (3.12), these three learners also took a more collaborative stance showing high instances of collaborative revision behaviour. For instance, Shoug deleted her own and others' existing ideas 18 times, added 20 new ideas, extended her own and others' existing ideas seven times, while also correcting 18 times formal errors. Lara performed several instances of revision practice, with 17 instances of adding, eight instances of deleting, six of extending and eight instances of correcting formal errors. A high number of contributions was also achieved by Rimas with 18 deletion contributions, 28 contributions in terms of adding new ideas, 17 contributions of correcting formal errors and 13 contributions of extending own and other existing ideas.

On the other hand, the fourth member in the group (Amani) participated little to the task. She was passive in the discussion mode with a few instances of revision behaviour made by her, such as deleting, adding and correcting formal errors, as shown in Table (3.12). For example, there were four instances of deleting others' existing ideas without posting any comment to clarify her performance. She posted only one comment during the planning of the task to show her view about the topic.

### ***B. Students' level of sharing the decision-making and the authority over the task***

Learners' collaboration in the planning stage reflected the extent to which the students could organise the work collaboratively and share the decision-making and the authority over the

task. A qualitative analysis of student interaction at this level suggested that three learners (Shoug, Lara, Rimas) out of four in the small group collaboratively planned the task, shared the decision-making and the authority over the task equally. The following extract illustrates how these three learners engaged in mutual interaction to share the decision-making over the task equally.

#### Extract 1

Google Doc interaction	Types of comments/edits
<b><u>Teacher said at 9:15 p.m. on Jun 20, 2021</u></b> Hello girls This is the topic of the essay. In the first stage, please collect ideas together?	Greeting + Giving instruction
<b><u>Shoug said at 9:45 p.m. on Jun 20, 2021</u></b> Hey everyone. I think I disagree with this statement because also living in a village has many advantages as living in a city.	Greeting + Suggestion + Justifying
<b><u>Lara said at 10:50 p.m. on Jun 20, 2021</u></b> For me I agree with the topic.	Showing agreement
<b><u>Shoug said at 11:02 p.m. on Jun 20, 2021</u></b> What about Amani and Rimas? Because we have to reach an agreement.	Question + requesting
<b><u>Rimas wrote at 1:44 p.m. on Jun 21, 2021</u></b> Brainstorming: Agree: Disagree:	Adding a new idea
<b><u>Shoug wrote at 1:46 p.m. on Jun 21, 2021</u></b> Many facilities Job opportunities	Adding a new idea
<b><u>Lara wrote at 1:56 p.m. on Jun 21, 2021</u></b> Transport Technology	Adding a new idea
<b><u>Rimas said at 2:4 p.m. on Jun 21, 2021</u></b> I think we are done from the agreeing ideas. Thank you girls, you did a great job. Shall we start with the disagreeing?	Suggestion +Requesting
<b><u>Lara said at 2:05p.m. on Jun 21, 2021</u></b> Yeah, let's start	Showing agreement
<b><u>Shoug wrote at 2:23 p.m. on Jun 21, 2021</u></b> Although many people argue that living in a village is more comfortable	Initiate writing + Adding new ideas
<b><u>Amani said at 7:21 p.m. on Jun 21, 2021</u></b> I partly agree with this statement because it is true that living in a city has	Showing disagreement



many benefits but not outweighing the benefits of living in a village.	
<b><u>Rimas said at 7:26 p.m. on Jun 21, 2021</u></b> I think now we have some who agree and others who disagree. I think it will be very good if we write in the second and third paragraph the advantages, disadvantages of the city and village, and then make them equal in the conclusion. What do you think? Waiting for your respond.	Suggestion + Eliciting
<b><u>Shoug said at 7:33 p.m. on Jun 21, 2021</u></b> Yes, a great idea	Showing agreement

When the teacher wrote the topic of the essay and asked the students to start their first stage of writing collaboratively, Shoug initiated the activity by posting her opinion. Next, Lara engaged with Shoug and posted her opinion. Other group members did not reciprocate Shoug's initiation in the discussion mode. Because of the absence of other's feedback, Shoug posted another comment whereby she invited others to engage with what she had suggested to reach an agreement in taking the decision over organising the task. Although Rimas did not respond to Shoug's request by posting a comment in reply, her writing behaviour reflected her response. She attempted to organise the process of taking the decision by writing two sub-heads (agree, disagree) in order to collect other members' ideas. Based on Rimas's suggestions, Shoug, Lara and Rimas started to collect their ideas collectively. Despite the presence of the teacher, Rimas did not hesitate to act as a teacher. Not only did she post comments that reflected monitoring the planning stage (i.e., asking her friends to stop collecting ideas showing agreement and to start collecting ideas showing disagreement), but she also left comments reflecting appreciation towards her friends' efforts in planning the work. Lara and Shoug reacted to Rima's comment by responding to her and engaging collaboratively, more specifically by collecting ideas that showed disagreement.

In contrast, the inactive learner (Amani) posted only one comment to show her opinion towards the statement of the topic without adding any ideas to the text in the planning stage. Her comment interrupted other group members since it was inconsistent with others' opinions. Also, it came very late after initiating the writing of the essay introduction. Rimas, who was one of the collaborative learners in the small group, attempted to tackle this interruption by providing a suggestion. Shoug and Lara agreed with Rimas's suggestion and completed their writing process.

### ***C. The level of students' mutual cognitive engagement***

Collaboration at this level reflects to what extent students can engage in a mutual cognitive interaction with each other. At this level, students should share content and language knowledge, seeking and giving language related feedback and helping each other to co-construct new knowledge. Similar to the previous level, the same three collaborative learners (Shoug, Lara and Rimas) interacted mutually in this level, as opposed to Amani who remained passive. *Extract 2* illustrates how the collaborative learners engaged in the collaborative dialogue.

## Extract 2

Google Doc interaction	Types of comments/edits
<p><b><u>Shoug wrote at 2:54 p.m. on Jun 21, 2021</u></b></p> <p>Nowadays many people argue that living in a village has many advantages. However, living nowadays most people choose to live in a city for many reasons. In this essay, we will discuss these reasons in detail.</p>	Organising the work + Deleting other existing words
<p><b><u>Shoug said at 2:57 p.m. on Jun 21, 2021</u></b></p> <p>I took my first sentence and Rimas second sentence and Lara's do you agree with the first paragraph.</p>	Clarifying + Eliciting
<p><b><u>Lara said at 2:58 p.m. on Jun 21, 2021</u></b></p> <p>Yeah, it's perfect</p>	Showing agreement + Praising
<p><b><u>Rimas said at 2:59 p.m. on Jun 21, 2021</u></b></p> <p>Perfectoooo</p>	praising
<p><b><u>Shoug said at 3:00 p.m. on Jun 21, 2021</u></b></p> <p>Ok now what is the first reasons for living in a city.</p>	Questions
<p><b><u>Shoug said at 3:01 p.m. on Jun 21, 2021</u></b></p> <p>We need an advantage reason.</p>	Elaborating
<p><b><u>Rimas said at 3:01 p.m. on Jun 21, 2021</u></b></p> <p>I am writing a sentence for that.</p>	Providing feedback
<p><b><u>Rimas wrote at 3:10 p.m. on Jun 21, 2021</u></b></p> <p>We believe that living in the city is comfortable because of having all the supplies although it is more expensive than the village. People living in the city never struggle with finding good hospitals, variety of food, luxury houses. Living in a city can also cost a lot of money-</p>	Providing feedback + Adding new ideas
<p><b><u>Rimas said at 3:15 p.m. on Jun 21, 2021</u></b></p> <p>What do you think about my paragraph?</p>	Eliciting + Seeking feedback
<p><b><u>Shoug said at 3:16 p.m. on Jun 21, 2021</u></b></p> <p>Very good, but are you going to talk about the advantages of village in next paragraph.</p>	Encouragement + Question
<p><b><u>Rimas said at 3:15 p.m. on Jun 21, 2021</u></b></p> <p>Yeah, but first we should add some ideas to my paragraph to make it longer and attractive.</p> <p>If you have something to add for my paragraph, go ahead.</p>	Elaborating + Requesting
<p><b><u>Lara said at 3:20 p.m. on Jun 21, 2021</u></b></p> <p>What about if you add for example before people?</p>	Providing feedback
<p><b><u>Rimas said at 3:21 p.m. on Jun 21, 2021</u></b></p> <p>You are right_You can put it</p>	Showing agreements + Requesting
<p><b><u>Teacher said at 5:28 p.m. on Jun 21, 2021</u></b></p>	Encouraging + Suggestion

It is very good start girls, please keep going. Now, you need to decide what you will write about in paragraph 1, 2, and 3.	
Amani, can you contribute to the activity and join your friends? I am sure that you have something to add.	
<b><u>Rimas said at 8:14 p.m. on Jun 21, 2021</u></b>	Thanking
Thank you, we will make sure to finish our work on time.	

As shown in the extract, the previous GD interaction can be characterised as reciprocal and student-centred, with students taking turns exchanging their feedback on what others have written on the GD page. The three collaborative learners interacted mutually to co-construct their knowledge. At the beginning of the interaction, Shoug attempted to join her sentence with her friend's sentence to rewrite the introduction while making some necessary modification to both sentences. Shoug politely and collaboratively clarified her performance and elicited others' opinions towards her performance. Rimas and Lara engaged with Shoug collaboratively by praising her work, which reflected their agreement with what she had done. Shoug then directed a requesting comment to other group members reflecting their need to add a sentence about the advantage of living in the city. The use of the first-person plural pronoun 'we' in Shoug's comment reflected the sense of belonging to the group and sharing the ownership of the text. Rimas incorporated with Shoug's request and replied that 'she is writing now' a text about the advantages of living in the city. As soon as Rimas finished writing her text, she sought feedback about her writing from other group members. Shoug appreciated Rimas's work; however, she seemed unsure about what they would write in the following paragraph. Therefore, she directed a question to Rimas if they would or would not write about the disadvantages of living in the village in the following paragraph. Rimas appeared to be willing to collaborate, since not only did she reply to Shoug but she also asked her to elaborate on her writing by adding more ideas about the advantages of living in the city in order to expand her text and make it longer and more attractive. Lara read Rimas's text and asked her politely to add one necessary phrase (for example) to her text. Rimas agreed with Lara's suggestion and posted a comment asking Lara to add that word herself. Her comment exhibited a collaborative behaviour whereby she reflected her agreement to editing her text by other group members without seeking her permission. In the course of the activity, the teacher intervened to not only appreciate learners' mutuality and give them some instructions, but also to notify the in-active learner (Amani) and encourage her to engage collaboratively to the activity. Since the teacher asked learners' to keep working collaboratively, Rimas reassured the teacher that they would work collaboratively and take the responsibility of producing the task on time. As shown in the previous extracts, the three learners (Shoug, Lara and Rimas) worked collaboratively, engaged in mutual collaborative dialogue to deliberate about the creation of their text, and took turns adding their ideas into the GD page. In addition, their use of 'we' seemed to exhibit their collaborative endeavour to maintain their collaborative work and their social relationship.

#### **D. The level of students' mutual social engagement**

Collaboration at this level refers to the extent to which learners establish friendly relationship. Learners' collaborative behaviour at this level should reflect how much they share the ownership of the joint text. It was obvious from the previous extracts (1 & 2) that the three collaborative learners (Shoug, Lara and Rimas) was concerned about their relationships with others when writing the online joint essay collaboratively. High instances of learners' social comments were conducted. For instance, learners posted some words to praise each other's

work, such as ‘perfect’, ‘good job’, and ‘great’. In addition, learners established friendly social relations not only by thanking each other but also by offering help to each other. For example, the following extract illustrates how Rimas struggled to edit the text and sought help. Shoug responded to her and provided her with some instructions on how to use GD.

#### Extract 3

Google Doc interaction	Types of comments/edits
<b><u>Rimas said at 2:28 p.m. on Jun 21, 2021</u></b> Girls, how can I put a line on the word? Please some help	Seeking help
<b><u>Shoug said at 2:33 p.m. on Jun 21, 2021</u></b> You should highlight the word then choose a suggestion then delete.	Clarifying
<b><u>Rimas said at 2:34 p.m. on Jun 21, 2021</u></b> Thank you so much sweetie	Thanking

#### *E. The students’ level of engagement with each other’s contributions to the written text*

Collaboration at this level reflects how students co-construct the online joint written text and to what extent learners engage mutually with each other’s contributions in the text mode. At this level, learners should show some collaborative behaviour, such as adding new ideas, expanding, and correcting each other’s existing texts, while having an ongoing chat in the discussion mode. Similar to the previous levels, the same three learners (Shoug, Lara and Rimas) collectively engaged with each other’s contributions and co-constructed the GD text. In contrast, Amani made a few instances of revision behaviours without posting any comments to clarify what she had done. *Extract 4* below showed how the three collaborative learners engaged with others’ texts and built on what others had already written.

#### Extract 4

Google Doc interaction	By	Types of comments/edits
<b><u>Lara wrote at 12:28p.m. on Jun 22, 2021</u></b> The beautiful part about living in the city is the ease of getting to where you want to go using public transportation.	S	Adding new ideas
<b><u>Shoug wrote at 1:00p.m. on Jun 22, 2021</u></b> In contrast, living in a village also has many benefits. One of the main ones is that it costs less.	S	Adding new ideas
<b><u>Lara wrote at 1:07 p.m. on Jun 22, 2021</u></b> For example, when my sister decided to buy a house, she did not struggle at all while searching in a village compared to a city. In addition, villages are safer than cities. For instance, recent statistics show that the crime level in the countryside is less compared to the city.		Expanding on others’ existing ideas
<b><u>Rimas said at 4:15 p.m. on Jun 22, 2021</u></b> Sorry for not jointing you today. I could not come earlier.		Apologising
<b><u>Rimas wrote at 4.20 p.m. on Jun 22, 2021</u></b> Another advantage of living in the city is the availability of public transportation. <del>The beautiful part about living in the city is the easy of</del>	S	Deleting others’ existing ideas + Adding to the text

<del>getting to where you want to go using public transportation.</del>		
<b><u>Rimas wrote at 4:23 p.m. on Jun 22, 2021</u></b> <p>In contrast, living in a village also has many benefits. One of the main ones is that it costs less in order to live “in a beautiful place”. For example, when my sister decided to buy a ‘big’ house ‘at a low price’, she did not struggle at all while searching in a village compared to a city. In addition, villages are safer than cities. For instance, recent statistics show that the crime level in the <del>village</del> “city” is <del>less</del> “more” compared to the <del>city</del> village.</p>	<b>S</b>	Adding to others’ existing ideas + Deleting others’ existing ideas
<b><u>Rimas said at 6:31 p.m. on Jun 22, 2021</u></b> <p>Girls, thank you for your great job today. I made some changes to the paragraph, see it and tell me your opinion. Hope you like it and I apologise again for not joining you earlier. BEST WISHES</p>	<b>S</b>	Clarifying + Eliciting + thanking + apologising
<b><u>Lara said at 7:28 p.m. on Jun 21, 2021</u></b> <p>Nice edit I agree with you.</p>	<b>S</b>	Praising + Showing agreement

In *Extract 4*, it is obvious that Lara added a new idea to the first paragraph. Shoug engaged with Lara in GD to initiate the next paragraph by adding a new idea. Furthermore, Lara responded to Shoug’s initiation and expanded on her idea by adding a supporting sentence. After a while, Rimas joined the group and apologised for not joining earlier. Then, she engaged critically with what had been added to the page. Rimas deleted Lara’s sentence, rewrote it in a different way, and made some corrections to both Shoug’s and Lara’s texts. It can be clearly seen from the extract that students used the discussion and text modes in a complementary manner to discuss their joint texts. For example, Rimas posted a comment to clarify her action, eliciting her friends’ opinions. Moreover, her comment included some social talk, by expressing her apologies and thanks to other members. Lara interacted with Rimas and posted a comment that reflected her agreement and praise of Rimas’s editing.

## Appendix J: Consent Form



### Students Information Sheets

#### **Exploring the effect of Google Docs mediated collaborative writing with and without teacher intervention on individual EFL students' writing abilities: A comparative study in a Saudi University Context**

##### **Dear students**

My name is Manal Alharee and I am studying a PhD in Applied linguistics at the University of York, in the UK. I am currently carrying out a research project with the title 'Exploring the effect of Google Docs mediated collaborative writing with and without teacher intervention on individual EFL students' writing abilities: A comparative study in a Saudi University Context'. I would like to invite you to take part in this research project.

Before agreeing to take part, please read this information sheet carefully to understand why this research is being done and what it will involve.

When participating in this research, you will get a free technical training session about how to write your essay using Google Docs. The session will cover features of Google Docs such as creating an account in Gmail, logging into an account, writing, posting, revising, editing and the page history.

The study will last for 14 weeks and if you wish to participate in this research, you will be asked to participate in:

- A pre-test and a post-test (written essays in week 1 and week 12).
- Two Training sessions in how to write an essay using Google Docs (Weeks 2&3).
- Writing an essay every two weeks collaboratively in small groups with teacher's intervention (if you are assigned to group A) or without teacher's intervention (if you are assigned to group B).
- Post activity semi-structured interview.

you have the right to participate or not and you could withdraw at any time. Any data collected from you will be dealt confidentially and for the purpose of research only.

The information about General Data Protection Regulation (GDPR) that is provided end of the sheet.

<https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/>

Participation is optional. If you do decide to take part, you will be given a copy of this information sheet for your records and will be asked to sign a consent form. If you change your mind at any point during the study, you will be able to withdraw your participation without providing a reason. If you want to stop taking part, please inform the researcher by sending an email ([ma1689@york.ac.uk](mailto:ma1689@york.ac.uk)). The data that you provide (e.g., the interview, written work scores) will be stored by code numbers on a password protected computer. Any information that identifies you will be stored separately from the data. You are free to withdraw from the study at any time **during data collection** and up to 3 weeks after the data is collected. Moreover, if there is a risk that participants may disclose information to me which I may feel morally or legally bound to pass on to relevant external bodies. Please notice that If I gather information that raises concerns about your safety or the safety of others, or about other concerns as perceived by the researcher, I may pass on this information to another person.

The anonymous data will be used only for the research purposes such as publications, seminars and conferences. I will archive the anonymous data after completion of my study to allow me to write up publications and do further analyses. However, the data will be destroyed as soon as there is no need to use them for further analyses.

If you if you decide to take part in the interview at the end of the study, you have the full right to check the transcripts of the audio-recording at any time by contacting the researcher within two weeks after finishing the interview. Moreover, you will be given an opportunity to comment on your written record of the event and omit any data that you do not want the researcher to include in the report.

If you have any questions about this participant information sheet or concerns about how your data is being processed, please feel free to contact my supervisor by email [khaled.elebyary@york.ac.uk](mailto:khaled.elebyary@york.ac.uk), or the Chair of Ethics Committee via email [education-research-admin@york.ac.uk](mailto:education-research-admin@york.ac.uk). If you are still dissatisfied, please contact the University's Data Protection Officer at [dataprotection@york.ac.uk](mailto:dataprotection@york.ac.uk)

I hope that you will agree to take part. If you are happy leave out to participate, please complete the form attached below.

Please keep this information sheet for your own records.

Thank you for taking the time to read this information.  
Yours sincerely

Manal A. Alharee  
Email: [ma1689@york.ac.uk](mailto:ma1689@york.ac.uk)

**‘Exploring the effect of Google Docs mediated collaborative writing with and without teacher intervention on individual EFL students’ writing abilities: A comparative study in a Saudi University Context’**

**Consent Form**

**Please tick each box if you are happy to take part in this research.**

<b>Statement of consent</b>	<b>Tick each box</b>
I confirm that I have read and understood the information given to me about the above-named research project and I understand that this will involve me taking part as described above.	
I understand that participation in this study is voluntary.	
I understand that my data will not be identifiable and the anonymous data may be used in publications, presentations and online.	
I confirm that I have read the information about GDPR	

Name of the participant:.....

Date:.....

Signature:.....

Name of the researcher:.....

Date:.....

Signature:.....



## **Information about the General Data Protection Regulation (GDPR)**

### **Processing personal data**

Under the General Data Protection Regulation (GDPR), the University has to identify a legal basis for processing personal data and, where appropriate, an additional condition for processing special category data. In line with our charter which states that we advance learning and knowledge by teaching and research, the University processes personal data for research purposes under Article 6 (1)(e) of the GDPR:

*Processing is necessary for the performance of a task carried out in the public interest*

Special category data is processed under Article 9 (2) (j):

*Processing is necessary for archiving purposes in the public interest, or scientific and historical research purposes or statistical purposes*

Research will only be undertaken where ethical approval has been obtained, where there is a clear public interest and where appropriate safeguards have been put in place to protect data.

In line with ethical expectations and in order to comply with common law duty of confidentiality, we will seek your consent to participate where appropriate. This consent will not, however, be our legal basis for processing your data under the GDPR.

### **Protecting and storing personal data**

Information that research participants provide will be treated confidentially and shared on a need-to-know basis only. The University is committed to the principle of data protection by design and default and will collect the minimum amount of data necessary for the project. In addition, we will anonymise or pseudonymise data wherever possible.

We will put in place appropriate technical and organisational measures to protect your personal data and/or special category data (for example, data may be stored in secure filing cabinets and/or on a password protected computer).

### **Sharing of data**

The default position is that personal data will only be accessible to members of the project team. In some cases, however, the research may be of a collaborative nature and hence the data will be made accessible to others from outside the University. Information specific to the project will include details of when this is the case, who the 3rd parties are, and what they will do with the data. It is possible that personal data may be shared anonymously with others for secondary research and/or teaching purposes.

### **Transfer of data internationally**

The default position is that data will be stored on University devices and held within the European Economic Area in full compliance with data protection legislation.

However, data may be transferred to the project partners based outside the European Economic Area. Any international transfer will be undertaken in full compliance with the GDPR.

The University has access to cloud storage provided by Google which means that data can be located at any of Google's globally spread data centres. The University has data protection compliant arrangements in place with this provider. For further information see,

<https://www.york.ac.uk/records-management/general-dataprotectionregulation/individualrights/>

### **Right to complain**

If you are unhappy with the way in which your personal data has been handled, you have a right to complain to the Information Commissioner's Office. For information on reporting a concern to the Information Commissioner's Office, see [www.ico.org.uk/concerns](http://www.ico.org.uk/concerns)

## Appendix K: Checking the fidelity to condition

As mentioned previously in section 3.7 the teacher was trained pedagogically on how to intervene with the students to promote their collaboration. Therefore, it was important to check whether the teacher in the experimental condition does indeed facilitate collaboration as intended before analysing learners' data. In alignment with the categories reported in the two taxonomies of collaborative behaviour created for this study (see section 3.8.2.1), three types of teacher support were considered in examining teacher's intervention as follows:

- **Teacher's support at the planning interaction level**
- **Teacher's support at the cognitive interaction level**
- **Teacher's support at the social interaction level**

### **Teacher's support at the planning interaction level**

examining the teacher's intervention in the planning stage showed that he started the activity by *establishing collaborative rules*. After adding the essay topic to the GD page of all small groups, a teacher used the discussion mode to post explicit instructions for his students whereby he guided them to organise their work collaboratively. The following extract illustrates this point.

#### **Extract 1**

<b>Google Doc interaction</b>	<b>Types of comments/edits</b>
<b><u>Teacher wrote at 7:25 a.m. on Oct 25, 2021</u></b> Write collaboratively an essay in English about the following topic: Some people think that online learning is better than classroom learning. <i><b>To what extent do you agree or disagree with the statement? Give reasons and example to support your answer.</b></i>	Adding to the text
<b><u>Teacher said at 7:30 a.m. on Oct 25, 2021</u></b> Hi my dear students, could you please read the topic and work together? I would like to remind you to respect the contributions of each other and collect your ideas collaboratively. First, you should discuss whether you agree or disagree with the statement.	Greeting + Giving instructions

In the above extract, the teacher guided students to certain collaborative behaviours. For example, he asked students in a friendly tone to read the topic and work collaboratively in collecting their ideas. Furthermore, he not only promoted group cohesion by reminding

students to respect each other's contributions but also, highlighted the importance of sharing the decision-making by advising them to discuss their opinion on the topic statement collaboratively.

Although the teacher minimised his interventions to give students space to collaborate during the planning stage, his organisational support was not restricted to posting the previous rules. The teacher intervened when it was necessary to *encourage collective planning* as shown in the next example.

### Extract 2

Google Doc interaction	Types of comments/edits
<p><b><u>Teacher said at 8:4 a.m. on Oct 25, 2021(group/6)</u></b>            Dear students, you did a great job planning the essay. Keep going. However, I noticed that you only added the ideas without engaging in discussion. I can see that your friend Abdullah sought feedback and clarification; however, you did not respond to him. You should help each other and engage in discussion to achieve your joint goal.            My dear student (Ibrahim), Please join your friend in planning the task. Since you are writing a collaborative essay, you should all participate in discussing all aspects of writing together.</p>	Encouraging + Promoting collaborative discussion + Promoting group cohesion + Promoting participation
<p><b><u>Teacher said at 8:07 a.m. on Oct 25, 2021(group/1)</u></b>            This is excellent planning. Dear students, please remember that this essay is collaborative work, so please invite your friend (Raid) to contribute and elicit his opinion on the statement before collecting the ideas.</p>	Encouraging + Promoting group cohesion
<p><b><u>Teacher said at 7:50 a.m. on Oct 25, 2021(group/5)</u></b>            You have made a great effort to plan the essay. However, dear students, make sure to decide through discussion whether you agree or not with the statement before starting to write.</p>	Encouraging + Promoting collaborative discussion
<p><b><u>Teacher said at 8:28 a.m. on Oct 25, 2021(group/2)</u></b>            Good planning. I'm happy that you were eager to engage all group members in planning.</p>	Encouraging + Promoting group cohesion

The above extract suggests that the teacher encouraged students to work as a group when planning their joint essay. For example, he ensured that learners participated equally by reminding students that they are doing group work rather than an individual activity, notifying inactive learners directly, or asking learners to invite their passive friends to contribute. Since the collective planning required more than participating, the teacher asked learners to engage in discussion to reach a mutual consensus. He explicitly encouraged learners to discuss their ideas collaboratively during the process of collecting ideas rather

than only limiting their planning to adding these ideas to the text, asked learners to reply to their friend's request, appreciated learners' effort in planning the task, and drew their attention to the importance of considering each other's contribution in achieving the common goal.

### **Teacher's support at the Cognitive interaction level**

The teacher played an effective role in supporting learners' mutual cognitive interaction by *promoting mutuality in learners' discourse*. For example, the extract below showed that teacher attracted the learners' attention to what had been submitted by others

#### **Extract 3**

<b>Google Doc interaction</b>	<b>Types of comments/edits</b>
<b><u>Teacher said at 7:22 a.m. on Nov 8, 2021(group/1)</u></b> Thank you, Ameen, for your contribution. I noticed that your friends seek clarification on your idea. Please explain and discuss your idea with your friends.	Promoting collaborative discussion
<b><u>Teacher said at 9:10 p.m. on Oct 31, 2021(group/4)</u></b> My dear students, your friend (Harbi) posted a suggestion. Please reply and share your idea with him.	Promoting eliciting ideas
<b><u>Teacher said at 5:10 p.m. on Nov 8, 2021(group/3)</u></b> Thank you all for your collaboration. You are an excellent group. I'm happy to see you exchange feedback, help, and encourage each other to co-construct sentences. However, I would like to remind you that if you make changes, you should mention politely why you made them.	Thanking, praising, and promoting giving feedback + group cohesion

As shown above, the teacher pointed out what other students posted during the writing process to promote mutuality in learners' conversations. He specifically requested that his students provide clarification on their idea, discuss their friend's suggestions, and justify their editing.

Moreover, the teacher supported learners' mutual cognitive interaction by *promoting the mutuality in learners' revision behaviour*, as in the following extract.

#### Extract 4

Google Doc interaction	Types of comments/edits
<b><u>Teacher said at 7:10 a.m. on Nov 9, 2021(group/1)</u></b> Hello, my dear students, I noticed that Ameen was the only student who started writing the second paragraph. Thank you, Ameen, for your active participation. However, it is important to invite your friends to complete your writing. Please, every student should extend the text by adding a support sentence, another new one, or editing the other's sentence. I want you to discuss and build the text collaboratively, as you did in the introduction and first paragraph. You did very well. Keep going.	Greeting + Thanking + promoting writing behaviour+ Giving writing instructions+ promoting group cohesion + Encouraging
<b><u>Teacher said at 10:4 a.m. on Oct 31, 2021(group/6)</u></b> Dear students Amr and Nawaf, I am sure you have something to add. Just to remind you that this is a joint essay, so please make your contribution.	promoting writing behaviour+ promoting participation
<b><u>Teacher said at 9: 30 p.m. on Nov 7, 2021(group/2)</u></b> Good job dear students, you have written a good introduction, however; I have made a few editing to connect the sentences. you should focus on the grammar rules mentioned in your book such as connection words, please learn from my editing how to use these connection words.	Encouraging + Notifying students about grammar use and editing +
<b><u>Teacher said at 5:12 p.m. on Nov 8, 2021(group/3)</u></b> My dear students, I would like to remind you that building on each other's contributions will help you to improve your knowledge and produce a well-structured joint essay, so please build on Fozan's idea by adding support sentences.	Promoting writing behaviour
<b><u>Teacher said at 7:00 a.m. on Nov 9, 2021(group/4)</u></b> Thank you (Ajlan) for your participation. For the rest of the group, I would like to remind you that your role is not only to encourage your friend; you should expand on your friend's text and make necessary changes.	Thanking + promoting editing behaviour +

As evidenced by Extract 3, the teacher instructed students to encourage one another to elaborate on what they have written rather than only praised one another's writing. he also advised them that they should add to the text, evaluate and correct each other's text. He promoted student equality by directly encouraging inactive members to contribute and reminding them that they were working in groups., Furthermore, to draw learners' attention to the grammar rules they had studied in class (i.e., connection words), the teacher not only urged students to focus on what was mentioned in their book but also corrected the students' writing using these grammar principles as a way of motivating them to learn from him.

Furthermore, the teacher enthusiastically *engaged students in collaborative dialogue* to discuss language use. He used a variety of methods to promote *Languaging* among students (See the following extract for examples).

### Extract 5

Google Doc interaction	Types of comments/edits
<p><b><u>Teacher said at 5:10 p.m. on Nov 1, 2021(group/6)</u></b> Thank you, my dear student Abdullah for your participation it is a good example, however, there were some grammatical mistakes. Please, my dear students, can you engage with your friend's text and discuss these grammar mistakes? Ibrahim, I'm sure that you are a good student and you are able to provide help for your friend. Amr, we miss you this morning, can you provide feedback for your friend.</p>	Thanking + Encouraging + Expressing emotion + Promoting giving language related feedback.
<p><b><u>Teacher said at 8:42 a.m. on Nov 1, 2021(group/3)</u></b> "Going forth and back"! I'm happy to see you using the idiom in your writing, Ali, but make sure you write it correctly. Please, dear student, discuss the correct way of writing this idiom.</p>	

As demonstrated above, the teacher clearly pushed learners to discuss their language use by drawing their' attention to the linguistic errors made by other students. courteously, He urged students to offer language critique to each other's writing.

Moreover, the teacher exploited inaccuracies in the use of English idiom to stimulate learners' collaborative dialogue. He particularly directed students to debate the proper manner of writing the idiom.

### Teacher's support at the social interaction level

By assuming *a non-authoritative role* and frequently *encouraging group cohesion*, the teacher supported learners' collaboration at the social interaction level. As is shown in the previous extract, the teacher took a non-authoritative stance when interacting with students by using *a friendly tone*. This was not only evident from his frequent usage of the term "*my dear students*" while addressing learners, but also from his greeting members of the group, encouraging and praising the quality of their work, and expressing appreciation and other good feelings. In addition, it was obvious from the above extracts that the teacher emphasized group harmony and cohesion by instructing students to value each other's ideas, suggestions, and group work.

## Appendix L-1 & L-2: Tests of normality for the pre-test scores

This appendix includes results of Shapiro-Wilk test for testing the normal distribution of the pre-test scores data.

### L-1: Results of Kolmogorov-Smirnov and Shapiro-Wilk test

#### Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<b>Pre-Test Scores</b>	.103	46	.200 <sup>*</sup>	.966	46	.196
<b>Post-Test Scores</b>	.080	46	.200 <sup>*</sup>	.989	46	.928

### L-2: Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Pre-Test Scores	Based on Mean	.771	1	44	.385
	Based on Median	.730	1	44	.397
	Based on Median and with adjusted df	.730	1	43.008	.398
	Based on trimmed mean	.804	1	44	.375
Post-test Scores	Based on Mean	.676	1	44	.415
	Based on Median	.497	1	44	.485
	Based on Median and with adjusted df	.497	1	44.000	.485
	Based on trimmed mean	.720	1	44	.401

## Appendix: M



**Kingdom of Saudi Arabia  
Ministry of Education Qassim University**

**College of Arabic Language & Social Studies  
Department of English and Translation**

المملكة العربية السعودية  
وزارة التعليم  
جامعة القصيم  
اللغة العربية والدراسات الاجتماعية  
قسم اللغة الإنجليزية والترجمة

### Permission to Conduct Research

### To Whom It May Concern

The Department of English and Translation at Qassim University is pleased to give Ms. Manal Aydh Alharee permission to conduct her study titled "Exploring the effect of Google Docs mediated collaborative writing with and without teacher intervention on individual EFL students' writing abilities" at our department. Ms. Alharee has the permission to collect and analyze data from undergraduate students' works/assignments in the course of Academic Writing (ENG 247) and recruit her planned study under the department's supervision. This letter was granted to her upon request. For any further information, please do not hesitate to contact the English Department at: [Englishdept@qu.edu.sa](mailto:Englishdept@qu.edu.sa)

**Head of the Department of English Language and Translation**



**Dr. Mohammad Fahad Aljutaily**



## **List of Abbreviations**

ANOVA	Analysis of variance
CALL	Computer-assisted language learning
CL	Collaborative learning
EFL	English as a foreign language
ELD	English Language Department
ESL	English as a second language
ESP	English for specific purposes
FL	Foreign language
FTF	Face-to-face
GD	Google Docs
GMCW	Google Docs-mediated collaborative writing
IRF	Initiation-response-feedback
L1	First-language
L2	Second language
LRE	Language-related episode
SCAPES	Studying Collaborative Authoring Practices in Educational Settings
SCT	Sociocultural theory
SL	Second language
SLA	Second-language acquisition
SPSS	Statistical Package for the Social Sciences
ZPD	Zone of proximal development

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