Technology Enhanced Collaborative Writing in Indonesian EFL Classroom

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Abstract

This study reports on the use of two types of technology in collaborative writing in English as a foreign language (EFL) classrooms in Indonesia: e-collaborative computer assisted language learning (CALL) and e-resources CALL. In particular, it investigates: 1) teachers' and pupils' perceptions of collaborative writing; 2) teachers' and pupils' perceptions of technology use in EFL collaborative writing; and 3) the effects on pupils' writing achievements of the two types of technology integration in EFL collaborative writing. This study employed a mixed methods approach. Six teachers and 192 pupils from six schools participated in this study, were selected using two sampling strategies, purposive and random cluster sampling. They were assigned to three research groups: an experiment group that undertook EFL collaborative writing with access to e-collaborative CALL, an active control group that used e-resources CALL, and a passive control group that had no access to technology. Interviews with teachers and focus group interviews with pupils were conducted to investigate their perceptions of collaborative writing and technology use in EFL collaborative writing. These qualitative data were analysed using thematic analysis. In addition, writing tests were given to the pupils before and after an intervention to evaluate the effect of technology use on pupils' writing achievements. Non-parametric tests were carried out to analyse these quantitative data.

The study showed that teachers and pupils had positive perceptions of collaborative writing in EFL classrooms. Working collectively to develop a text with other peers in the group benefited pupils' EFL learning in that it facilitated knowledge sharing and cognitive development, helped to create a comfortable learning environment and thus increased pupils' learning motivation. Collaborative writing activity was also found to facilitate the development of pupils' ability to work together with peers and respect other pupils' opinions. Teachers and pupils also perceived the use of technology in EFL collaborative writing positively. While the use of some online resources such as English learning websites, Google, Wikipedia and online dictionary were found to help pupils with model of text, spelling and vocabulary, the use of wiki in EFL collaborative writing was perceived to increase pupils' learning motivation and provide them with opportunities to learn about spelling, wording, sentence structure and grammar. However, the quantitative data analysis showed that technology use in EFL collaborative writing had a positive but insignificant effect on pupils' writing achievements, indicating that pupils who use technology, either e-collaborative CALL or e-resources CALL in EFL collaborative writing did not perform better than those who attended collaborative writing without any technological support. Moreover, writing achievements of pupils who used e-collaborative CALL and e-resources CALL in EFL collaborative writing and those who only used e-resources CALL remained similar. The study discusses possible reasons for this effect. In particular, the study suggests

the need for high-quality technology facilities in schools, and technical support for EFL teachers who incorporate technology into the classroom.

The study is limited by small sample size, limited period of intervention and methodology. The participants of the study were selected using purposive sampling on the basis of three criteria: instructional approach, English teacher qualifications and availability of school facilities and they only involved six teachers and 192 pupils. It therefore, participants' view in the study do not represent an overall view of teachers and pupils of EFL in general. In relation to the intervention period, the study lasted only four out of eight weeks that had already been planned, giving them little opportunities for the pupils to practice collaborative writing activities with technological support. The study was also limited by the methodology in that pupils' writing abilities before the intervention were found to be unequal across participating groups. Besides, there was not control over teachers' instructional activities at the post-intervention stage. With these limitations, findings of the study may not be generalizable to English language teachers and pupils across the country.

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Declaration

I declare that this doctoral thesis is my original work. No part of this thesis has been published or submitted to a degree or qualification in other institutions or universities.

Chapter 1. Introduction and thesis overview

This chapter provides an outline of the study and comprises five sections. Section 1.1 discusses the background of the study, and Section 1.2 presents its purpose and the research questions. The significance of the study is presented in Section 1.3, Section 1.4 provides a brief overview of the methods employed to address the research questions, and Section 1.5 describes the structure of this thesis. Section 1.6 provides summary of the chapter.

1.1 Background of the study

The use of technology in classrooms is already common in the field of teaching and learning English as a foreign language (EFL). This is mainly because technology offers learners opportunities to explore and analyse the use of English in a particular context, to practise composing texts in English, and to communicate and collaborate (Rank, Warren, & Milum, 2011). For example, learners can use technology to explore a variety of discourses and contexts in English language use. It also allows learners to analyse particular texts that they encounter, annotate them, and compose new ones by considering particular linguistic features. With regard to the use of technology to enable communication and collaboration, the development of Web 2.0 technology offers learners opportunities to engage in dynamic interactions, which helps develop their knowledge and understanding of English language use.

Wikis are the most widely-used Web 2.0 technology to facilitate collaborative work in EFL writing classrooms. With wikis, learners are able to work in a group and jointly develop a text. Wikis also allow anyone in the group to modify the text through editing features, such as adding, editing and deleting text or words in the wiki workspace. For EFL teachers, wikis log pupils' writing activities, enabling them to identify the strengths and weaknesses of pupils' writing.

There is considerable evidence showing the benefits of using wikis in writing classrooms. In the EFL context in particular, several studies have suggested that wikis may enhance learners' ability to write in English. For example, Alshumaimeri (2011) investigated the use of wikis in EFL writing classrooms at King Saud University in Saudi Arabia, with 42 male student participants attending an intensive English language programme. An experimental research method was employed with a pre- and post-test design. The study

found significant differences in accuracy, quality and overall scores between the experiment and control groups, indicating that using wikis in writing activities significantly affects students' writing achievements.

Aydın and Yıldız (2014) examined the use of wikis in a collaborative writing project at a Turkish university. In this study, 34 intermediate-stage university students were asked to complete three collaborative writing tasks using a wiki. The findings show that the use of wikis for collaborative writing activities enhances students' writing abilities, particularly in the aspect of grammar. The students' accurate use of grammatical structures improved to 95 per cent.

Li, Chu, and Ki (2014) investigated the effects of a wiki-based collaborative process writing pedagogy (WCPMP) on pupils' writing abilities and attitudes in an upper primary school in China. A total of 109 pupils participated in the study and they were assigned to two groups: experiment and control groups. The experiment group had a WCPMP treatment, while the control group learned English under a traditional teacher-centred individual writing pedagogy (TTIWP). Writing tests were employed to evaluate pupils' writing achievements before and after the intervention, and writing attitude tests were administered to examine pupils' attitudes to the use of wikis. The study found that the use of wikis in a collaborative writing activity among upper primary school pupils has a positive and significant effect both on pupils' writing achievements and on their attitudes.

In a study, Lin and Yang (2011) investigated potential use of wiki technology to help develop students' writing skills. Specifically, the study explored students' perception of using wiki during wiring course and their perception of peer feedback. A total of 32 university students participated in the study where they were asked to make self-reported reflection. Lin and Yan also collected additional data from observation, interviews with the students and survey. Findings of the study showed that most of students perceived positive about their ability to use wiki and feedback given by other group members. Students reported to have writing progress in the aspect of grammar and style but not in the aspect of organisation and content. The study also showed that wiki was perceived as a new technology for the students and this new technology was considered difficult for the students to use.

Mak and Coniam (2008) examined authentic collaborative writing activity through the use of wiki by 7 grade English as a second language (ESL) pupils. In total, 24 pupils in a secondary school in Hong Kong participate in the study where they were asked to write collaborative text over a period of two months, as an integral part of their school homework. To promote authentic writing activity, pupils' final draft of the writing was printed into a brochure format and distributed it to their parents. Finding of the study

showed that collaborative writing enabled pupils to produce more text with greater complexity. The findings showed that pupils were given opportunities to reorganise text as well as correcting it and accordingly improve their writing ability, particularly on the aspect of coherence.

Wang (2014) conducted a study to examine the use of wiki in an EFL writing classroom. In the study, Wang surveyed 42 technical university students in southern Taiwan and did interviews with twelve students. In addition to these data, students' reflections on their experience of using wiki for collaborative writing activities were collected and analysed. The study found that writing collectively using wiki help increase students' learning motivation and enhance their confidence in writing in English. In addition, collaborative writing was found to promote their social interaction.

The earlier study reported above have shown that wiki offers an ideal environment for the students to learn about writing and develop text collaboratively (see also in Storch 2013). More importantly, findings of the earlier study also indicate that using wiki to facilitate students' collaborative writing activities has positive impact on students' learning and achievement in writing, particularly in the aspect of vocabulary, grammatical structure, and cohesion. In addition to positive effect of wiki on students' writing achievement, wiki was found to offer benefits towards students' attitude and learning motivation. Unfortunately, except Li, Chu and Ki (2014) and Mak and Coniam (2008), the study on the use of wiki to facilitate collaborative writing were apparently carried out in a higher-education context, involving more adult students. Moreover, most of the study was conducted in the context of English as a second language (ESL) learning. These have motivated the present study to examine the use of wiki to facilitate collaborative writing activities in English as a foreign language (EFL) classrooms in Indonesian secondary schools.

In Indonesia, teachers are still reluctant to use technology in primary and upper primary school classrooms. Data from the Ministry of Communication and Informatics (MOCI) show that internet use in schools in 2014 was relatively low, accounting for only 5.6 per cent of total internet use across the country. This number had increased to 24.2 per cent by 2015.[1] Moreover, although 80 per cent of schools have already been provided with internet access, only 39 per cent of students are reported to be benefiting from its use (Heppy et al., 2011), suggesting that schools' ICT facilities, and particularly internet access, are not yet being used by teachers and students. A survey by Son, Robb, and Charismiadji (2011) supports this finding. They evaluated the computer literacy and competency of EFL teachers in Indonesia, and found that non-primary school teachers used computer applications more frequently than primary school teachers. Their findings show that 28 per

[1] Source: https://balitbangsdm.kominfo.go.id

cent of primary school teachers used the internet to access online resources, while almost 65 per cent of non-primary school teachers did so. Several factors may hinder teachers' use of computers for classroom instruction in primary schools, including their own attitudes to technology (Cahyani & Cahyono, 2012), limited access to ICT infrastructure and resources in schools (Ali, 2004; SEAMO, 2010), insufficient bandwidth for internet access (Ali, 2004), limited time, and lack of knowledge and computer skills by both teachers and pupils (Son et al., 2011).

Personally, as a teacher, I have been using technology to facilitate my classroom instruction for the last ten years. I have used different types of technology to help me distribute teaching and learning materials (e.g. Google Drive), to present the materials in the classroom (e.g. PowerPoint, blog, Moodle-based website) and to assess my students' learning of English (using Hot Potato, ATutor, and Quiz Maker). I also use technology for my professional development, such as participating in Coursera, webinars and Facebook fan pages (e.g. Teacher Voice: Professional Development, Curriculum 2013). Unfortunately, I observe that many of my colleagues still do not use technology, despite the benefits offered by integration of technology into classroom teaching. I notice that some of my colleagues often use a single type of technology (i.e. PowerPoint) to teach the four language skills, and wonder whether they have limited knowledge of technology to facilitate students' foreign language learning. This has been a personal motivation for my PhD research investigating teachers' and pupils' use and perceptions of technology in EFL classrooms.

This study aims to explore teachers' and pupils' perceptions of collaborative writing activities and the use of technology in such activities in EFL junior secondary schools in Indonesia and, more importantly, to examine its impact on pupils' writing achievements.

1.2 Purpose of study and research questions

The present study addresses the following six research questions:

RQ1 *What are Indonesian junior secondary school teachers' perceptions of EFL collaborative writing activities?*

a) *What are teachers' perceptions of collaborative activities before and after the implementation of an EFL collaborative writing activity?*

b) *Do teachers' perceptions of collaborative activities change following the implementation of an EFL collaborative writing activity?*

RQ2 What are Indonesian junior secondary school teachers' perceptions of technology use in EFL collaborative writing activities?

a) What are teachers' perceptions of technology use in EFL collaborative writing before and after the implementation of an EFL collaborative writing activity enhanced with computer technology?

b) Do teachers' perceptions of technology use in EFL collaborative writing change following the implementation of an EFL collaborative writing activity enhanced with computer technology?

RQ3 What are Indonesian junior secondary school pupils' perceptions of EFL collaborative writing activities?

a) What are pupils' perceptions of collaborative writing before and after the implementation of an EFL collaborative writing activity?

b) Do pupils' perceptions of collaborative writing change following the implementation of an EFL collaborative writing activity?

RQ4 What are Indonesian junior secondary school pupils' perceptions of technology use in EFL collaborative writing?

a) What are pupils' perceptions of technology use in EFL collaborative writing before and after the implementation of an EFL collaborative writing activity enhanced with computer technology?

b) Do pupils' perceptions of technology use in EFL collaborative writing change following the implementation of an EFL collaborative writing activity enhanced with computer technology?

RQ5 Is there any difference between teachers' and pupils' perceptions of EFL collaborative writing and of technology use in EFL collaborative writing?

a) Do teachers' perceptions of collaborative writing differ from pupils' perceptions before and after the implementation of an EFL collaborative writing activity?

b) Do teachers' perceptions of technology use in EFL collaborative writing differ from pupils' perceptions before and after the implementation of an EFL collaborative writing activity enhanced with computer technology?

RQ6 Do two types of technology integration, e-collaborative CALL and e-resources CALL, in an EFL collaborative writing activity affect pupils' writing achievements?

a) Does the e-collaborative CALL group achieve better than the non-CALL group?

b) Does the e-resources CALL group achieve better than the non-CALL group?

c) Does the e-collaborative CALL group achieve better than the e-resources CALL group?

1.3 Overview of methods

As previously mentioned, this study addresses six research questions (RQs) to examine Indonesian junior secondary school teachers' and pupils' perceptions of EFL collaborative writing and the use of technology in EFL collaborative writing, differences between the two, and the effects of two types of technology integration, e-collaborative CALL and e-resources CALL, on pupils' writing achievements. The study employed a mixed methods approach with a quasi-experimental design to answer these research questions. A qualitative research method was employed to address research questions 1 to 5, using data obtained from semi-structured interviews with teachers and focus group interviews with pupils before and after an intervention. These qualitative data were then analysed using thematic analysis.

Quantitative research was used to address research question 6. A quasi-experiment was employed to examine the effects on pupils' writing achievements of two types of technology integration, e-collaborative CALL and e-resources CALL, in an EFL collaborative writing activity. Three types of treatment conditions were assigned to the pupil participants: use of e-collaborative CALL, use of e-resources CALL, and no use of CALL. These three treatment conditions led to the development of three research groups: an experiment group, an active control group and a passive control group. The experiment group, comprising pupils from the e-collaborative CALL group, used a wiki as a collaborative tool during a writing activity. These pupils also had access to e-resources CALL. The active control group comprised pupils with access to e-resources CALL - who used online resources during a collaborative writing activity. Non-CALL pupils comprised a passive control group; they carried out collaborative writing with no access to either e-collaborative CALL or e-resources CALL. The intervention adopted an instructional model drawn from the systemic functional linguistics (SFL) genre pedagogy (see Emilia, 2005a; Hyland, 2003b, 2009; Platridge, 2001) and technology integration (see further Chapter 4, subsection 4.6). This instructional model involves four stages: building knowledge, modelling, joint construction of text, and independent construction of text. Descriptive texts were used as instructional materials for this study, selected by the teacher participants themselves.

The quantitative data were collected through timed writing tests: a pre-writing test (before the intervention), a post-writing test (after the intervention) and a delayed post-writing test (two months after the study ended). Due to violation of the parametric assumption of normality, these quantitative data were analysed using non-parametric tests. Several non-parametric tests were carried out, including a Wilcoxon signed-rank test, a Mann-Whitney test, a Friedman test and a Kruskal-Wallis test. A false discovery rate (FDR) was applied as a probability value in the statistical tests. Prior to these statistical tests, assumption testing was carried out, including data screening, and examining the assumptions of normality and homogeneity of variance.

This study employed between-method triangulation to promote the validity of the results. The qualitative data from interviews with teachers and focus group interviews with pupils were corroborated by quantitative data gathered from the timed writing tests, helping to provide a better understanding of the different treatment conditions and how they affected pupils' writing achievements.

1.4 Significance of the study

The study makes contributions to the current literature, policy and foreign language pedagogy and methodology. It contributes to the current literature on the effective use of technology in collaborative writing classrooms, providing new evidence on the use of wikis in collaborative writing classrooms in an Indonesian junior secondary school context where English is taught as a foreign language. The results of the study also have implications for the current policy of the Ministry of Education and Culture (MOEC), in that they provide new evidence regarding the role of ICT teachers in classroom instruction. The study also has implications for the practice of ELT in Indonesia, specifically in employing peer feedback as a pedagogical tool in English writing classrooms. Finally, this study provides an insight into research methodology.

1.5 Structure of the thesis

This thesis has eight chapters. Chapter 1 is an introductory chapter which explains the background and purpose of the study and the research questions, and the significance of the research. A brief overview of the methods employed to address the research questions is also provided in this chapter. Chapter 2 discusses the research context of Indonesia. It presents the educational system in the country, the school curriculum and Indonesian ELT. Chapter 3 discusses important aspects of Vygotsky's sociocultural theory as a theoretical

framework for the study, the nature of collaborative learning and collaborative writing in ELT, and various aspects of using technology in EFL collaborative writing.

Chapter 4 describes the methodological framework adopted for this study. It explains the pragmatic paradigm of the study and the rationale for adopting a convergent design to address the research questions. It also describes the research participants and explains the process of the study. Chapters 5 and 6 present the findings from the qualitative and quantitative data respectively. These findings are then discussed in Chapter 7, addressing the six research questions of the study.

Finally, Chapter 8 draws together the main ideas presented in this study. It begins with a summary of the findings, and then highlights the implications of this study for the current literature, policy, foreign language pedagogy and methodology. The chapter also explains the limitations of the study and offers recommendations for future research.

1.6 Summary

This chapter has presented the background of the study. The objective and the research questions addressed in the study have also been stated. Methods of the research is discussed in brief. The chapter also has presented the contributions of the study to the current literature, policy and foreign language pedagogy and has described the structure of the thesis.

Chapter 2. Indonesian Context

This study focuses on the use of technology in collaborative writing activities in Indonesian schools. This chapter will provide a general picture of the Indonesian education context, and, in particular, language teaching and learning practices in schools. The following Section 2.1 will introduce the Educational system in Indonesia. Reforms have been made in the educational field since the country's 1998 political reforms. The transformation from a centralised to a decentralised government system has brought considerable change in the national education system. The national education bill, passed in 2003, requires school-based management and curricula. The new education system encourages all stakeholders to take part in educational decision-making processes, including in schools. In order to ensure the quality of education across the nation, the government has established a national education standard for all educational levels and school accreditation. This will be discussed in Sub-section 2.1.1 and 2.1.2 respectively. Section 2.2. will discuss about school-based curriculum and Section 2.3 explain the teaching of English demanded by the curriculum. Section 2.4 describes the current practice of English language teaching in Indonesia and finally, section 2.5 summarises the chapter.

2.1 Educational system in Indonesia

The Indonesian national system of education has changed fundamentally as a consequence of the political transformation from centralised to decentralised governance in 1998. A decentralised system entails the transfer of authority and responsibility from central government to local governments, in this case to provincial and district governments. According to Kristiansen and Pratikno (2006), the primary aim of decentralisation in Indonesia is to reduce central government expenditure, while at the same time increasing the responsibility and contributions of local governments. A new policy on decentralisation with regard to regional government, known as Law 22, 1999, has been in effect since 2001, and its implementation has affected various government regulations. As a result, the strictly hierarchical relationship between central government, provinces and districts has been abolished, regional heads are now selected by regional legislative bodies, and local governments are responsible for managing the daily operations of activities in sectors including education, health, public work and public spaces, housing, public protection and social issues (Kristiansen & Pratikno, 2006, p. 518).

The implementation of decentralisation in the education sector has enabled local governments (or districts) to manage their own education activities at two levels of schooling: primary and secondary schools (Sutapa, 2005). This has benefited schools in every region, as they are empowered to manage their own funding and teaching and learning activities and, more importantly, develop their own curricula based on the interests of the local community (see in Yulia, 2014). However, despite these benefits, the implementation of the decentralisation policy has raised concerns regarding the equity and quality of education across each district of Indonesia. It is important to note here that Indonesia has 440 districts with diverse local characteristics, and the implementation of decentralisation may potentially result in discrepancies between districts in the equity and quality of their education. In order to address these issues, the government issued Law 20, 2003 on the National Education System, to maintain the expansion and equity of education access, facilitate and create learning communities, maintain high-quality moral education, improve the professionalism and accountability of educational institutions, and maintain the involvement of the community. The government also has set up 13 strategies, two of which are the development of national education standards and school accreditation. The following sub-sections will discuss these two strategies.

2.1.1 National education standard

The enactment of Law 20, 2003 on the National Education System required the development of a national education standard, known in Indonesian as *Standar Nasional Pendidikan* or SNP. SNP was further regulated through Law 19, 2005, which was later amended by Law 13, 2015. SNP sets out the minimum criteria that should be met by all levels of schooling across Indonesia, from primary to secondary level. It is designed to serve as a basic reference for every local government with regard to curriculum planning, implementation and monitoring activities, and to provide quality assurance on the national education system in general. SNP consists of eight national education standards relating to graduate competency, content, process, personnel, infrastructure, management, funding and assessment. Law 19, 2005 explains each of the standards, and the two that are relevant to this study are discussed below.

Personnel standard

The personnel standard is a set of requirements that should be met by teachers and school staff, including “their educational background, pre-service educational criteria, physical and intellectual suitability and in-service training” (Yulia, 2014, p. 12). With regard to junior secondary teachers, the MOEC’s Regulation 16, 2007 states that teachers at junior secondary schools and Islamic secondary schools should have a diploma four certificate (D-

IV) or bachelor's degree (S1) relevant to the subjects they teach. Teachers are also required to demonstrate four main competencies: pedagogical, emotional, social and professional. In order to ensure the quality of teachers, the government carried out a teacher certification programme which aimed to reach 2.3 million teachers by 2015 (Fahmi, Maulana, & Yusuf, 2011).

Infrastructure standard

The infrastructure standard concerns the availability of classrooms, sports fields, prayer space, libraries, laboratories, playgrounds, learning resources and other facilities that sustain teaching and learning activities, including the use of information and communication technology (ICT). This standard is detailed in Law 24, 2007. In junior secondary schools, the school classroom should be large enough for 15 to 32 students, with a minimum of two square metres per student. The infrastructure standard regarding computer laboratories and other ICT is not detailed in the Law, but is explained in MOEC (2008). A national standard school should have at least one computer laboratory of 35 personal computers (PCs) with internet access. The school must also employ a computer technician to help teachers and students to use these facilities for teaching and learning activities.

In addition, to help meet the infrastructure standard, particularly availability of information and communication technology at schools, the Directorate of General Secondary School and MOEC provide ICT grant worth a total of 4,179 USD per school (see Belawati, 2003). Throughout 2002-2003, there were at least 173 across the country affected by the grant. And 9 years later in 2012, the efforts shows positive results. Survey conducted by Sumintono, Wibowo, Mislan, and Tiawa (2012) has shown that about 95 per cent of public junior secondary schools possess one or more computer laboratories, each comprising 28 to 40 personal computers (PCs). In addition, the government also launched the National Education Network (Jaringan Pendidikan Nasional, known as Jardiknas) which aimed at following (Firman & Tola, 2008, p. 77):

> "1) to establish the flow of data, information, and communication among all education offices at the national, provincial, district/city, and university and school levels; 2) to provide free access of intranet connection for all schools in Indonesia; 3) to provide free and cheap e-learning resources; and (4) to facilitate free access for knowledge sharing, research and development."

Firman and Tola (2008) also adds that Jardiknas is specifically aimed to facilitate the practice of e-learning, enabling teachers and students to carry out teaching and learning activities beyond their traditional ways.

Besides the government supports for ICT facilities and internet access, the school policy has also been developed to facilitate the incorporation of ICT in classrooms. A survey conducted by Centre for Information and Communication Technology for Education (known as PUSTEKKOM) as cited in Belawati (2003) evaluates ten senior secondary schools' policies with respect to technology use. The findings show that all ten school participants had developed a policy which allowed the integration of computer studies in the learning curriculum. The findings also highlight one main reason for such an integration of technology, that is to allow students use technology to facilitate their learning in classrooms.

2.1.2 School accreditation

As mentioned previously, the enactment of Law 20, 2003 required the development of a school accreditation system for quality assurance of school education. Subijanto and Wiratno (2012) state that school accreditation is an effort by the government to control, assure and monitor the quality of teaching and learning activities in schools. Schools are accredited every five years by the National Accreditation Board for Schools and Islamic Schools (known in Indonesian as Badan Akreditasi Nasional Sekolah/Madrasah or BAN S/M). BAN S/M is an independent and non-structural body that was established in 2005 and began to operate in 2007 (Kingham & Parsons, 2013). The body consists of 11 to 15 members who carry out three functions: formulating operational policy, disseminating requirements and carrying out school accreditations (MOEC, 2005). In carrying out its functions, the body is fully funded by MOEC with money from national and provincial budgets.

A school's accreditation status is specified as Grade A, B, C or not accredited. This status classifies the quality of educational standards met by schools. Grade A represents excellent quality, with scores for the eight standards between 86 and 100. Grade B characterises good quality, with scores ranging from 71 to 85. Grade C indicates fair quality, with scores between 56 and 70. Schools with scores below 56 receive no accreditation status. In Jakarta, data from BAN S/M show that 3.641 junior secondary school have already been accredited between 2012 and 2015. This number is higher than the total number of schools accredited between 2007 and 2009 which was only 234 schools (Source: http://bansm.or.id/akreditasi/seluruh_jenjang, retrieved 28 June 2016).

2.2 School-based curriculum

The implementation of decentralisation in education also required the development of teaching and learning curricula in schools. The enactment of Law 20, 2003 granted schools the power to develop their own curricula, known as Kurikulum Tingkat Satuan Pendidikan (KTSP). It is clearly stated in the Law that a school's learning curriculum is to be developed

by the school in accordance with the level of education, the potential resources of the region, and the learners. Interestingly, KTSP is developed collectively by teachers and the community around the school in accordance with several principles: 1) it promotes student-centred learning; 2) it meets students' interests and characteristics; 3) it is updated with recent developments in knowledge, technology and art; 4) it meets the demands of its stakeholders; 5) It facilitates the comprehensive and sustainable development of learners; and 6) it meets national and regional interests (BSNP, 2006a). However, although schools are given opportunities to develop their own curricula, they are still required to meet the eight national education standards already established by the government (Madya, 2003).

KTSP has been officially used since 2006, replacing the 1994 curriculum which was considered to be centralistic. At the junior secondary school level, the structure of KTSP includes the teaching of ten main subjects, plus local content and students' personal development. These subjects are taught over two semesters (34-38 weeks).

Table *2.1* summarises the main subjects, local content and students' personal development, as well as the number of teaching hours.

Table 2.1 Main subjects, local content and personal development in junior secondary school curriculum

Subject	Number of teaching hours*		
	Grade 7	Grade 8	Grade 9
Religion	2	2	2
Citizenship	2	2	2
Bahasa Indonesia	4	4	4
English	4	4	4
Mathematics	4	4	4
Natural science	4	4	4
Social science	4	4	4
Art and culture	2	2	2
Physical exercise	2	2	2
ICT	2	2	2
Local content	2	2	2
Personal development	2	2	2
Total hours	32	32	32

*One hour equals 40 minutes

As shown in Table 2.3, KTSP facilitates the teaching of local content. Local content in this context refers to materials developed by teachers and the local community to introduce pupils to the culture, characteristics and resources of their region. The next section elaborates on the teaching of English in the school curriculum.

2.3 English in the school curriculum and classroom pedagogy

Indonesia has two levels of school education: primary and secondary. The primary education level covers six years (grades 1 to 6) in primary schools (Sekolah Dasar or SD) and three years (grades 7-9) in junior secondary schools (Sekolah Menengah Pertama or SMP).

Secondary education takes three years (grades 10-12) in senior secondary schools (Sekolah Menengah Atas or SMA). The government's policies for teaching English differ for these two educational levels. In primary education, English was officially introduced into primary schools (SD) as local content when the government released the 1994 curriculum (Faridi, 2010; Madya, 2002; Sujana & Narasintawati, 2006; Sutardi, 2005). As local content, English is not a compulsory subject, but is left to schools to decide whether they will include it as a subject in the school curriculum, in accordance with the needs of people around the school (Emilia, 2005b; Faridi, 2010). In Indonesia, English is taught as a foreign language (FL).

By contrast to primary schools, in junior secondary schools (SMP) and senior secondary schools (SMA) English is taught as a compulsory subject (Emilia, 2005b; Lie, 2007; Nababan, 1991). In junior secondary schools, the teaching of English aims to enable pupils to achieve a functional level of English use. This means that pupils will have the ability to use English, in both spoken and written form, to solve daily problems (BSNP, 2006b). There are three competencies that characterise the functional level of English use. First, discourse competence relates to pupils' ability to understand and/or produce oral and/or written material relating to four language skills. Second, pupils must be able to understand and produce various short functional texts, monologues, and essays relating to procedure, description, recounting, narrative and reports. Third, supporting competency concerns linguistic competence (e.g. grammar, vocabulary and pronunciation), sociocultural competence (e.g. formal and informal expressions), strategic competence (e.g. solving communication problems), and competence to form a discourse (BSNP, 2006b, p. 124).

In order to attain the functional level of English use, teachers are required to help pupils: 1) develop their communicative competence in spoken and written forms of language to achieve functional literacy; 2) have awareness of the concept and importance of English; and 3) develop their understanding of the links between language and culture (BSNP, 2006b, p. 124). To this end, the Indonesian government adopts systemic functional linguistics (SFL) genre-based approach as classroom pedagogy of teaching English in secondary schools (Kasihani, 2000 cited in Emilia, 2005; Emilia & Hamied, 2015). In this pedagogy, several types of text (e.g. descriptive, report, procedure, narrative and recount) are introduced and taught to the students (see BSNP, 2006b; Kemdikbud, 2013) to present "the ways we exchange information and knowledge and interact socially" (Callaghan, Knapp, & Knobble, 1993, p. 193). Texts, in this context, are viewed as communicative events (Swales, 1990) that allow "interactants to exchange meaning in a context of situation and in a context of culture" (Widodo, 2015, 34). The principles of SFL-genre pedagogy for classroom practice is further discussed in Chapter 3 section 3.1.3. and the classroom procedure is detailed in Chapter 4 section 4.6.

2.4 Current teaching of English writing at research site

The study was carried out at a junior secondary school (SMP) in Jakarta where KTSP is applied. Within this curriculum, the teaching of English is allotted four 40-minute teaching periods per week (BSNP, 2006b). The teaching of English writing skills for first-year pupils aims to achieve two competence standards (SK):

1. To express meaning from a short written functional text to be able to interact with people in their surrounding; and
2. To express meaning from a written functional text and a short, simple descriptive and procedural essay to be able to interact with the nearest environment (BSNP, 2006b, pp. 127-128).

The teaching of English writing at the research site have several challenges, particularly teaching methodology, pupils' lack of vocabulary and linguistic competence and limited access to learning resources at schools. Setyaningrum (2010), for example, highlights some writing problems encountered by junior secondary school pupils with regard to spelling and punctuation and developing the model text. Her classroom action research found that inappropriate teaching methodology has been a major problem which needs to be improved through the implementation of task-based language teaching.

In addition to Setyaningrum (2010), a study conducted by Bahri and Sugeng (2009) shows that junior high school pupils have poor vocabulary and linguistic competences. The findings of their study has indicated that pupils' biggest writing problems are in the areas of verb tenses, articles and word formation. Moreover, the finding suggests that pupils' writing errors are generally influenced by the adoption of their first language in writing. Lack of appropriate media to expose the target language and low pupil learning motivation were identified as indirect factors leading to writing problems.

Lie (2007) indicates that poor learning resources and learning environment are constraints to successful EFL teaching in Indonesian schools. Limited learning resources, such as lack of self-access learning facilities and a learning environment in which pupils are unable to gain sufficient language exposure, are seen as factors resulting in pupils not being connected to adequate learning resources.

2.5 Summary

This chapter has described the Indonesian contexts of the present study. As discussed in the chapter, national education standards and school accreditation have been used by the Indonesian government to maintain the equity and quality of education at schools across

each district of Indonesia. The chapter also has discussed school-based curriculum and the SFL genre-pedagogy which is adopted by the Indonesian government as classroom pedagogy for the teaching of English as a foreign language (EFL). The last section of the chapter has presented the current teaching of English writing at research site.

Chapter 3. Literature review

This chapter provides the relevant literature underlying the recent work on the use of technology in collaborative writing in EFL classrooms in Indonesia. The chapter is divided into six sections. The following section 3.1 presents three writing approaches in language learning classrooms, including the product approach, the process approach and the genre approach. Section 3.2. discusses the theoretical framework of collaborative learning activity. There are two important issues discussed in the section including the sociocultural theory and its two main concepts. Computer use in collaborative writing classrooms is discussed in Section 3.3. Section 3.4 is concerned with the previous studies related to the use of technology in a collaborative writing activity and 3.5. explains potential use of wiki in EFL collaborative writing respectively. Finally, Section 3.6. summarises the chapter.

3.1 Writing approaches

This section discusses three recent approaches to writing, including the product approach, the process approach and the genre approach. The following sub-section 3.1.1 discusses the product approach to writing and focuses on examining two surface aspects of language: grammatical and lexical aspects. The second approach, the process approach, is discussed in sub-section 3.1.2, and finally sub-section 3.1.3 is centred on the genre approach to writing, and details three main issues: writer processes, system of texts (e.g. style and structure of the text), and the varied contextual setting in the development of a good piece of writing (Johns, 2011). Since the present study was carried out in Indonesian EFL classrooms which apply a systemic functional linguistics (SFL) framework for classroom instructions, the focus in this section is on the genre approach to writing. The product and process approaches to writing are discussed briefly in the following sections.

3.1.1 Product approach

The product approach to writing was developed in 1966 with its emphasis on the accurate application of grammatical rules (Raimes, 1991). Specifically, the product approach focuses on the appropriate use of vocabulary, syntax, spelling, and punctuation (Young, 1978 cited

in Matsuda, 2003; Pincas, 1982). Young (1978, cited in Matsuda, 2003, p. 70) suggests three key characteristics that define the product approach: (1) the emphasis on the composed product rather than the composing process; (2) the analysis of discourse into words, sentences, and paragraphs; and (3) the strong concern with usage (syntax, spelling, punctuation) and style (economy, clarity, emphasis). According to Hyland (2003b), the focus on the accuracy and correctness of language use - such as syntax, spelling etc. - that was given by the product approach was primarily influenced by the behaviourist learning theories of second language teaching, i.e. the Audiolingual approach that prevailed in the 1960s. In the Audiolingual approach, speech was regarded as the primary element, and writing "served essentially to reinforce oral patterns of the language being learned and to test learners' accurate application of grammatical rules" (Rivers, 1968 cited inFerris & Hedgcock, 2005, p. 11). It is thus, in the product approach, that writing development is mainly focused on learners' abilities to use grammatical and syntactic forms accurately (Raimes, 1983).

Some writing scholars suggest a four-stage classroom procedure that characterises the product approach, including familiarisation, controlled writing, guided writing and free writing (Albesher, 2012; Hyland, 2003b; Pincas, 1982). First, the familiarisation stage aims to prepare students for actual writing. At this stage, teachers introduce certain grammar and vocabularies through the use of specific contexts (Hyland, 2003b). In studying a formal letter, Steele (2004) exemplifies that teachers may introduce their students to paragraphing and language use for formal requests. Second, the controlled writing stage provides an opportunity for students to practise some aspects of grammar and vocabulary which were highlighted during the previous familiarisation stage. At this stage, students are involved in analysing a text, and then they are encouraged to write some simple sentences about the text using phrases from a substitution table. It is important to note that teachers who employ the product approach are required to strictly control the formal accuracy and correctness of language use, e.g. the grammatical and lexical rules. Teachers need to focus on forming habits of accurate and correct use of language in order to help learners to stop making "errors ostensibly caused by first language interference" (Silva, 1990, p. 12). These activities are believed to help students write coherent paragraphs (see Nunan, 1991) and prevent them from making errors (Richards, 1990). Albesher (2012) suggests that teachers

may carry out two activities to control students' writing, namely combining exercises (e.g. combining words by matching or re-ordering), and substitutiion activities in which students are asked to imitate texts modelled by their teacher and follow the teacher's instructions. The third stage is the guided writing stage. Here in this stage, students are encouraged to produce a piece of writing by imitating model texts; and finally, in the free stage of the writing stage, students develop writing by using the patterns that they have already become familiar with.

To sum up, the product approach views writing as mainly concerned with knowledge about the structure of language, and therefore the development of students' writing abilities relies heavily on the result of the imitation of input, i.e. model texts given by the teacher (Badger & White, 2000). The product approach favours classroom activities because it helps students in the early stages of their writing to develop and improve their grammatical accuracy (Zamel, 1983, cited in Albesher, 2012); and it also helps students to form learning behaviour which prevents them from producing errors in writing (Richards, 1990). However, although the product approach offers a number of benefits to learners, the approach is shown to pay little attention to the writing process, such as planning and drafting a text (Badger & White, 2000); it limits the writer's freedom for creative writing (Silva, 1990); and it over-emphasises the surface level of writing aspects, e.g. vocabularies and grammar (Hyland, 2003b; Zamel, 1987). These limitations, according to Zamel (1987), have constrained learners from identifying strategies to produce a good piece of writing. The following section will discuss the process approach to writing that mainly focuses on the writer.

3.1.2 Process approach

The product approach to writing was widely accepted by writing researchers through the 1950s and 1960s. However, during that time, writing researchers began to identify some limitations of the product approach, including the absence of composing processes, limited freedom for the writers and the exploitation of lower level writing aspects. Nunan (1991), for example, argues that the imitation of texts may enable students to understand and use aspects of the surface level of writing, such as vocabulary, grammar, spelling; however, students may encounter difficulties when dealing with a higher level of writing, e.g. level of

discourse. O'Donnell's (1964) study published in *The Journal of Educational Research* shows that there is a low correlation between knowledge of grammar and proficiency in communication skills like writing. The finding suggests that students' awareness of basic structures (surface level of writing aspects) may be essential to written composition, yet it does not necessarily promote proficiency in writing. O'Donnell (1964) argues that writing involves a complex process and that it requires more than ability to manipulate basic elements of the sentence. These limitations of the product approach have thus been the drivers for the paradigm shift from the product approach to the process approach that happened at the end of the 1960s (Clark, 2003)

Instead of viewing writing as a product, in the process approach to writing, writing is viewed as a complex, recursive, creative and generative process (Silva, 1990; Silva & Leki, 2004). According to this view, writing is not mainly concerned with its product, but rather it is depicted as a process of discovering ideas, selecting vocabulary, considering audience and writing style (Albesher, 2012; Badger & White, 2000; Susser, 1994). The act of writing, according to Zamel (1983), allows writers to explore their ideas, clarify and reformulate them, and eventually they are able to develop a new pattern of thought through a piece of writing. This process of writing helps writers to understand that different kinds of writing require different kinds of writing (Susser, 1994). For example, the process of writing a post card to a friend would apparently differ from the way one undergoes producing a piece of academic writing (Tribble, 1996). By understanding the differences in writing style, writers are given opportunities to "choose the process that suits their writing style, and the particular writing task they face" (Susser, 1994, p. 35). More importantly, the process of writing facilitates the writers ability develop a piece of writing product that meets its readers' expectations as they review their writing, reconsider its function, and keep a distance between themselves and the text (Zamel, 1983).

In a classroom context, the process approach to writing suggests that learners' writing development is facilitated through the key stages of planning, transforming ideas into language and its orthographic representation (also called drafting), and rewriting it to improve its quality (Patthey-Chavez, Matsumura, & Valdés, 2004). In the planning stage, learners, for example, were asked to brainstorm a certain topic. At the drafting stage, learners were encouraged to select and arrange their discussion to provide a plan for their

writing. This writing plan, according to Badger and White (2000), would help learners produce their first draft, and later they were able to make changes or proofread the draft. In addition, the process approach to writing considers teachers as skilful writers, and they are expected to share their expertise to students who are novice writers (Richards, 1990). A teacher's role in each writing stage therefore, is to provide students with assistance and guidance in a positive and motivating atmosphere in order to help students discover their writing strategies that allow them to find and express their intended meaning (Silva & Leki, 2004).

To sum up, the process approach has favoured writing in the classroom as it emphasises individual writers and the writing itself (Hyland, 2003a, 2003b). As argued by Clark (2003), the focus on individual writers has given students an opportunity to express their thoughts and personal experiences through writing; this has enabled them to discover their own strategies to produce a piece of a good writing. The process approach to writing however, overemphasises the relationship between the writers and their individual strategies (Swales, 1990, p. 220), and this neglects social aspects and the writing contexts that contribute to the development of a good written text (see Hyland, 2003a). In other words, as Hyland (2003b) argues, the process approach to writing does not sufficiently address the issue of how writers use language patterns to communicate with readers in particular social contexts. Many writing scholars, such as (Hyland, 2002, 2003a, 2003b, 2004, 2007) and Johns (1995, 2002) have thus suggested the genre approach to writing to fill the gap, as it provides writers with clear and systematic explanations about the complex relationship between written texts and the social settings in which they are situated (Myskow & Gordon, 2010). This will be discussed in the following section, (3.2.3).

3.1.3 Genre approach

Some authors (e.g. Matsuda, 2003; McComiskey, 2000) suggest that the genre approach to writing is an extension of the process approach. Berlin (1984), Bizzell (1986) and Faigley (1986) as cited in Matsuda (2003), for example, include the social view into their classification of two major theories underlying the process approach, i.e. expressive and cognitive views. The expressive view emphasises the writer's freedom to express their ideas in writing; the cognitive view focuses on the mental process of composing; the focus on the

social view of writing, according to Faigley (1986), is concerned with "how the individual is constituent of a culture" (p. 535). Moreover, Hyland (2009, p. 25) argues that the process of writing includes a number of elements, that together with cognition, embrace the writer's personal experience and background, a sense of self, of others, of situations and finally of purpose. Several studies, e.g. Indrasutra (1988) as cited in Leki (1991) and Hinkel (1997) provide evidence that supports Hyland's argument. Indrasutra's (1988) study comparing Thai and U.S high school student writing suggests that Thai student writing strategy focuses on the internal struggle and is primarily affected by their previous Buddhist training emphasising human inability to affect external events. Hinkel's study in 1997 included more participants from diverse backgrounds. Hinkel (1997) examined indirectness in 120 non-native students' academic writing from China, Korea, Japan and Indonesia. He found that the writing of Chinese, Korean, Japanese, and Indonesian students is often unclear and indirect when compared to that of American students. He suggests that students' cultural influences and beliefs are factors contributing to the vague and indirect nature in the students' writing. The act of writing therefore, should be seen from the outlook of society rather than of the individual (Faigley, 1986); it is performed purposefully to share meanings in certain communication and social settings (Hyland, 2009).

In addition, as an extension of the process approach, the genre approach to writing takes into consideration not only writer processes, but also the system of texts (e.g. style and structure of the text), and the varied contextual setting in the development of a good piece of writing (Johns, 2011). Within the genre approach, a writer is regarded as a social being, and the writing itself is viewed as genre exemplar which is purposeful and socially responds to particular contexts and communities (Hyland, 2003a; Johns, 2002a). In other words, good writing, according to Hyland (2004), represents the writer's knowledge of his/her context, and the readers that form part of that context. Many writing scholars (e.g. Hyland, 2007; Johns, 2002a; Myskow & Gordon, 2010; Tardy, 2011) argue that a focus on genre may facilitate writers to address the social context in which writing happens. In other words, the focus on genre may help writers to better understand the use of language as a symbolic tool to achieve social purposes in a particular context of use (Hyland, 2007, p. 148). Flowerdew (1993, p. 307) suggests that some ranges of writing types may connect to different settings and purposes, such as research articles, scientific writing, as well as sales

letters. It is thus, as Bathia (1993, p. 37) argues, that the genre approach to writing shifts from a surface-level of linguistic description to "a more functional and grounded description of language use".

According to Badger and White (2000), the genre approach to writing is considered a relatively new approach; however, the term genre itself has existed for more than a century, and writing scholars have been using it to refer to "complex, oral or written responses given by speakers or writers to meet the demands of social context" (Johns, 2002a, p. 3). Within this definition, genre is viewed as a class of communicative events with particular communicative purposes that are determined by and shared among members of the discourse community (Swales, 1990).

Although the genre theorists and researchers have agreed on the key features of genre, such as text purpose, form and situated social action, they have interpreted genre in a variety of ways, particularly on how genre should be defined and realised in classroom practices (Cope & Kalantzis, 1993a; Hyon, 1996; Johns, 2002a; Johns et al., 2006). Hyon (1996) classifies genre into three schools of thought: (a) English for specific purposes (ESP). Researchers in this ESP genre, e.g. John Swales, emphasise genre as a tool for evaluating and teaching spoken and written language for academic and professional purposes; (b) North American New Rhetoric studies (known also The New Rhetoric or NR). Researchers in this field pay more attention to the functional and contextual aspects of genre, and they have employed ethnographic rather than linguistic methods for examining texts; and (c) Australian systemic functional linguistics (SFL) which is grounded in the Systemic Functional Linguistics (SFL) work of Michael Halliday (1988), a British-born linguist. From a linguistic perspective, Flowerdew (2002) highlights fundamental differences between the three schools of thoughts as follows:

> ESP and the Australian school take a linguistic approach, applying theories of functional grammar and discourse and concentrating on the lexico-grammatical and rhetorical realization of the communicative purposes embodied in a genre, whereas the New Rhetoric group is less interested in lexico-grammar and rhetorical structure and more focused on situational context - the purposes and functions of genres and the attitudes, beliefs, values, and behaviors of the members of the discourse communities within which genres are situated (p. 91).

Flowerdew's (2002) quotation above suggests that both ESP and the Australian school (SFL) genre employ the situational context to explain the linguistic and discourse structure. In contrast to this, the New Rhetoric uses the text to understand the situational context. The pedagogical implication of these two views for classroom practice is that both the ESP and SFL focus on "teaching students the formal, staged qualities of genres so that they can recognise these features in the texts that they read and use them in that text that they write" (Hyon, 1996, p. 701), while in the New Rhetoric school, Flowerdew (2002) and Hyon (1996) maintain that classroom instruction should be concerned with the awareness of the situational characteristics and social function of genre that students use. Bazerman (1988, cited in Hyon, 1996, p. 699) notes that, instead of the fundamental differences between the three, classroom instruction should not overemphasise the genres that students need to work, but rather to enhance their understanding of the social life attached to the texts.

This present study is carried out in the context where SFL genre-pedagogy has been adopted as classroom pedagogy for the teaching of English as a foreign language (EFL). To provide more understanding about SFL-genre pedagogy and its classroom practice, the following sub-section will discuss the nature of SFL, the SFL-informed classroom instruction illustrating the application of SFL genre writing pedagogy in classrooms, principles in SFL genre-based writing instruction, and relevant studies to the SFL genre approach to writing.

Systemic Functional Linguistics (SFL)

Systemic Functional Linguistics (henceforth SFL) highlights a social theory of language as being primarily concerned with how meaning is created in different social settings. Within this social theory of language, which is also known as social semiotic theory, language is understood as a social semiotic (Christie, 1999; Emilia, 2005; Halliday, 1978; Widodo, 2015). Language is said to be semiotic because it reflects a process of making meaning by selecting available alternatives that constitute what can be meant (Halliday, 1978; Widodo, 2015). The notion of language as a social semiotic captures the interconnection between culture as a system of meaning, and language as one of its realisations (Halliday, 1978). In other words, as a social semiotic, the use of language and the meaning created through such language use strongly relies on its surrounding environment, and this circumstance may explain that the way people use language may change from a particular social context to another

environment (Bezemer & Kress, 2008). Accordingly, linguistic forms in a language are developed and engage with particular rules applied to social contexts (van Leeuwen, 2005; Ventola, 1984). It is thus that people need to be aware of a particular sign system applied in a particular social context to explore certain meanings (van Leeuwen, 2005).

SFL was first introduced by Halliday (1978) and emphasises the systemic and functional nature of language. Language is viewed as systemic as it offers a system of choice (i.e. the range of linguistic resources or choices) that people can choose to make meanings in their social interactions. For example, some words like *husband, man*, *honey*, *darling* are possible available alternatives (i.e. options) that may fit the expression: *When I went home yesterday, I found my … had washed all the dishes*. The choices that people can make to construct meanings from such an example are varied according to the context of the situation, such as the field of discourse (the social action that is taking place), the tenor of discourse (the participants, their statuses and roles), and the mode of discourse (what part of language or text is involved) (Derewianka & Jones, 2012; Paltridge, 2001). In more detail, Halliday and Hasan (1989, p. 12) propose three contexts of situation (also known as a register variables) that construct meanings within social communication; these are highlighted in the table below:

Table 3.2 Halliday and Hasan's three context of situations

The field of discourse	The tenor of discourse	The mode of discourse
What is happening; the nature of the social action that is taking place: what the participants are engaged in, and in which the language figures as some essential components?	Who is taking part; the nature of the participants, their statuses and roles: what kind of role relationships are obtained by the participants, including permanent and temporary relationships of one kind or another, both the types of speech role that they are taking on in the dialogue, and the whole cluster of socially significant relationships in which they are involved?	What part the language is playing, what it is that the participants are expecting the language to do for them in that situation: the symbolic organisation of the text, the status that it has, and its function in the context, including the channel (is it spoken or written or some combination of the two?), and also the rhetorical mode: what is being achieved by the text in terms of such categories as persuasive, expository, didactic, etc.

Adopted from Halliday and Hasan (1989, p. 12)

Drawing from the above context of situations, Derewianka and Jones (2012, pp. 36-37) illustrate that in the field of explaining how to make a cake, for instance, the choice of language that users can choose may involve an action process in the simple present tense such as 'to give commands' (e.g. blend, mix, pour). Within such a field, the participants (e.g.

chef in a restaurant) may use some concrete nouns to represent utensils and ingredients (e.g. a bowl, the mixture, an egg) and employ some expressions to explain particular circumstances related to the process (e.g. carefully, for thirty minutes, in the oven).

In SFL, language is also viewed as functional, suggesting what language can do or what we can do with it (Halliday, 1978). Widodo (2015) states that language is functional for it suggests systemic resources for language users to make and change meaning, and intentional acts of meaning. Thus, for example, individuals can use language to understand and construct world views, to communicate with others, and to structure their experiences (Webster, 2009). Halliday and other scholars working in SFL propose three key functions of language that conceptualise meaning: ideational - dealing with using language to represent experience; interpersonal - that is concerned with language use to manage interactions between people using the language; and textual - that it is to use language to create connected and coherent discourses. Hasan (2004) recognises these three conceptions of meaning as meta-functions of discourses (see Figure 3.1). Widodo (2015, p. 32) comprehensively demonstrates the interconnection between Halliday and Hasan's (1989) contextual variables and Hasan's (2004) meta-functions of discourse, and this can be seen in the table below:

Table 3.3 SFL Meta-functional meanings

Contextual variables	Meta-functions	Reality construct	Work done
Field	Ideational	Reality	Representing our experience of reality
Tenor	Interpersonal	Social reality	Enacting our social relation
Mode	Textual	Semiotic reality	Presenting messages as text in context

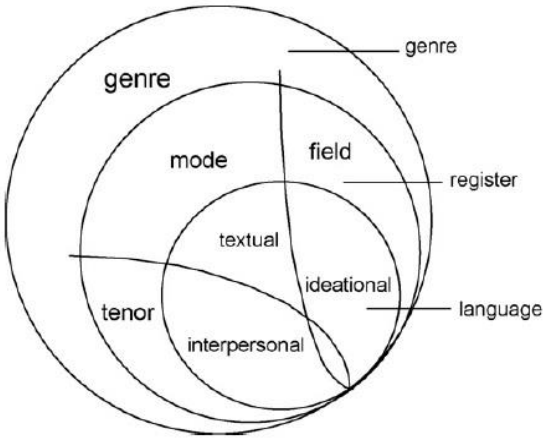


Figure 3.1 Meta-function perspective of language and social context (adopted from Martin, 2009)

The tripartite meta-functional perspective as presented in the above table and figure suggests an alternative to interpreting meaning from a discourse in line with its register (context of situation), variables of field, tenor and mode (Martin, 2009). Likewise, these variables can be seen as semiotic resources, and together with language, they are employed to construct a discourse (Hasan, 2004; Martin, 2009; Widodo, 2015). According to Martin (2009, p. 11), ideational meaning can be used as a resource for building knowledge that facilitates individual participants in domestic, recreational, and professional activities. Interpersonal meaning provides a resource that values these activities, and textual meaning is practicably employed as a resource for putting together the ideational and interpersonal meanings within the texture of the text appropriate to mode (i.e. the communicative demands and alternative communication modalities). The contextual variables, i.e. field, tenor and mode, help to draw the social and semiotic reality in language form, and accordingly they present text in context. It is thus, that text as a discourse can be regarded as a multifunctional construct, and it represents the process and product of social meaning in particular social settings.

In order to provide more understanding on how meaning is made under SFL theory, some important notions, such as text and context, register and genre, are discussed in the following section:

1. Text and context

Text is believed to be a representation of language which people use either for speaking or writing (Halliday, 2007; Halliday & Matthiessen, 2004).This belief seems to place text functionally, viewing text as “any meaningful passage of language that serves some social purpose” (Christie, 1999, p. 760). Grabe and Kaplan (1996, p. 40) suggest a label for text as “a structural equivalent of language in real use which conveys meaning”. In other words, text seems to be understood as a collection of signs which carry meaning within a framework of any social relations occurring in the community.

By looking at the function of a text in a social interaction, and meaning created in such conditions, a text plays a significant role as “a form of exchange” between two or more people in communication (Halliday & Hasan, 1989, p. 11). This interaction may be naturally directed by a number of intentions from parties in the communities engaged in communication; Hyland (2003b) indicates that text structure is open to modification in order to match certain meanings intended by the writers.

It seems obvious that meaning carried by text seems to be strongly dependent upon context where the text is used (Grabe & Kaplan, 1989; Grabe & Kaplan, 1996; Hyland, 2009; Witte, 1992). In other words, text may be seen as what people selectively use to represent meaning (Whitelaw & Argamon, 2004) by which the meaning itself is much affected by context where it is used within a communicative event (Halliday & Hasan, 1976, 1989; Halliday & Matthiessen, 2004). Grabe and Kaplan (1996) suggest that text, in particular written text, is likely to be structured to transfer information and fulfil requirements of conventions related to the writer's situation, his/her motivation and behaviour.

Some authors (e.g. Grabe & Kaplan, 1989; Grabe & Kaplan, 1996; Halliday, 2007; Halliday & Matthiessen, 2004; Hyland, 2009; Witte, 1992) believe that meaning from text could be appropriately emerged when it is derived from its context. The terminology of context itself seems to be derived from the two separate notions of *con,* which means together, and *text* (Emilia, 2005b; Halliday, 2007; Halliday & Hasan, 1989). These two

notions, *con* and *text,* are likely to be understood as an existence of text which follows other texts in order to make meaning (Halliday & Hasan, 1989). Within this understanding, meaning, which is represented by text, is strongly interpreted and understood within the framework of context.

The notion of context is likely understood as the situation or condition within which language is engaged (Halliday, 2007; Hyland, 2009). Hyland (2004) adds that the term context does not seem limited to referring to the physical environment where language is used to carry out particular meaning, but also some other non-linguistic elements and events. In other words, it may be viewed that context exists in two environments: linguistic and social processes (Matthiessen, Teruya, & Lam, 2010). Thus, borrowing Malinowski's notions of contexts, two classifications of context which influence the derivation of meaning from text are offered: context of situation and context of culture (Halliday, 2007; Matthiessen et al., 2010; Paltridge, 2001).

In SFL, meaning from a text is made by the interference of two contexts which are known as register, for the representation of context of situation, and genre for the context of culture (Emilia, 2005b; Halliday, 2007). These two contexts likely exist to similarly represent engagement between language (or said as text) and its context (Martin & Rose, 2007 cited in Matthiessen et al., 2010) under environment placing "register realising genre" (p. 22). The notion of register and genre will be discussed respectively as below.

2. Register

From an SFL perspective, register is recognised as context of situation (see Halliday, 2007; Halliday & Hasan, 1989; Hyland, 2009; Matthiessen et al., 2010). Halliday and Matthiessen (2004) firmly state that the way people use language is primarily dependent upon the environment in which they live. Looking at this perspective, register may reflect the level of formality in using the language (Celce-Murcia & Olshtain, 2000; Martin, 2009) , where the use of language differs for communication with close friends from how it is used for public purposes.

The notion of register was originally adopted from the notion of context of situation from Malinowski's writing in 1923. Malinowski used the notion of context of situation to

represent “the environment of text” (Halliday & Hasan, 1989, p. 6). Context of situation draws an understanding on how meaning from any text is highly dependent on the context of complete expressions (Halliday, 2007). In this understanding, language is firmly varied depending on the environment in which it is used. Hyland (2009) states that examination of the text used may reveal a real situation, or show the choice of language use based upon the situation.

Thus, as register is firmly proposed to provide understanding of the relation established between text and the social interaction within which the text is involved (Halliday, 2007; Halliday & Hasan, 1989; Halliday & Matthiessen, 2004), register may be viewed as “a functional variety of language” (Halliday & Matthiessen, 2004, p. 27) of which the making-meaning in communication is derived from the field of communication (what is happening), the tenor (who is taking part, or the participants), and mode (what part of language or text is involved) (Halliday, 2007; Halliday & Matthiessen, 2004; Hyland, 2009; Martin, 2009; Paltridge, 2001). Each manifestation of register in the making meaning process affects each other in this process. Paltridge (2001) draws an instance to show engagement of each manifestation as follows:

> Each of these variables has an impact on the language of a text. For example, Field influences such language features as vocabulary choice and verb selection. Tenor influences such aspects of language as expressions of probability, obligation, or necessity, attitude, and clause type (such as declarative, interrogative, or imperative).The mode of a text influences, for example, patterns of cohesion and aspects of language (pp. 45-46).

Besides the context of a situation (as discussed earlier), the meaning of a text may also be interpreted in the context of culture. The discussion of genre which is viewed as the context of culture (Hyland, 2009; Paltridge, 2001) is presented in the next section.

3. Genre in SFL

The relationship between language (texts) and contents (contexts) is fundamental in SFL, and as Hyland (2004) has argued, the interaction between these two can only be explained by “seeing them against their social settings” (p. 26). As was discussed earlier, SFL linguists have attempted to explain language and its role in the social construction of meaning.

Halliday and other scholars working in SFL have viewed language and its function as a semiotic system within which language, as a system of choices, offers people linguistic resources that enable them to communicate particular functions of the language. Such choices are made according to its register (or context of situation). With this in mind, the choices (i.e. language forms) that people make when developing a text can therefore be meant to involve the context of culture or social setting. Text as a discourse is said to represent the process and product of the social construction of meaning. In other words, text can also be regarded as "an intersubjective stretch of language where involved interactants exchange meaning in a context of situation and in a context of culture (Widodo, 2015, p. 34).

Genre in SFL is viewed as "a staged goal-oriented social process" (Martin, 1993; Martin, 2009, p. 13) characterising social context as a system of genre (Martin, 1993). It is staged because people employ more than one phase of meaning to work through a genre. Genre is goal-oriented because it unveils the stages which are purposefully designed to achieve particular communication objectives. The social genre involves social interaction among members of a social community. The notion of "a staged goal-oriented social process", therefore reflects an interconnection between language choices and cultural purpose by suggesting the stages through which individuals afford to achieve particular goals in their social communication (Paltridge, 2001). Such a notion therefore has shaped the term *genre* into the social purpose of text, and captures its distinguished schematic structure (Macken-Horarik, 2002).

Besides viewing genre as a staged goal-oriented social process, many SFL theorists such as Christie (1991), Martin (1992, 1993), and Macken-Horarik (2002) and some other SFL scholars have conceptualised genre as a representation of text types that are classified according to their rhetorical patterns, such as reports, discussions, explanations, retellings and some others. As a meta-functional construct, each of the texts suggests an identifiable structure that offers "a series of clauses which creates a congruent realization of realty involved" (Christie, 1991, p. 144). Macken-Horarik (2002, pp. 20-23) introduces what is called the *schematic structure of text* (or also known as generic structure) as a predictable sequence of stages that characterises a type of genre. She suggests that the information report (also known as description) genre, for example, aims to describe "the way things are"

by classifying things and then making descriptions of their specific characteristics. The information report genre can be found in pamphlets, brochures, product details or posters with specific information about a topic. The schematic structures (stages) of such a type of genre respectively include (1) a *general statement (classification)* that provides information about a topic or subject being described, (2) *a description of aspect that* focuses on the description of the characteristics (or different aspects) of the subject, and (3) a *description of activities* that deals with behaviour, functions, or uses. Some viable language features that can be used to develop an information report text may include the present tense, technical vocabulary related to the subject being described, verbs to define, characterise, label and describe and the possible use of the passive voice.

As another example, a procedure text is developed to explain how to do something through a sequence of stages. This type of text can be seen in cookbooks or manuals. The schematic structure in the procedure text development includes (1) a goal statement, (2) a presentation of the stages to inform the activities needed to be done in order, and (3) a result that provides the final stage or the final look of the activity. From these two instances, it can be understood that different texts may employ different structures of vocabulary, grammar and cohesion depending upon their communicative purposes; and when a set of texts suggest similar objectives, they are likely to share a similar structure, i.e. organisation of the paragraphs and accordingly how they belong to the same genre (Hyland, 2009).

SFL-informed writing classroom instruction

SFL provides a framework for classroom writing instruction in three ways. First, SFL helps teachers formulate the fundamental goals for the writing instruction. Callaghan, 1991 as cited in Hyon (1996) suggests that the essential goal of the genre-based pedagogy for primary and secondary schools is to enable students to participate in the school curriculum and their social community. Specifically, the classroom writing instruction is to enable students to develop texts in a context by employing proper meaning-making choices based upon a specific rhetorical goal, (Yasuda, 2015, p. 106) e.g. to describe things, or to explain certain procedures of making things etc. With this in mind, to achieve such a goal, classroom teachers then are required to empower students with various linguistic resources relevant to the genre (e.g. forms, vocabularies) that they can use to make and organise meaning that

fits the context (Hyon, 1996; Yasuda, 2015). Using the example of an Indonesian classroom, Bumela (2012) suggests that a student's quality of interpretation of text is frequently influenced by their textual experiences, such as features of text, and most importantly text meta-functions. The study highlights the importance of student knowledge of meta-functions from the text as salient elements in meaning-making activities.

Second, from a linguistic perspective, the SFL conceptualisation of genre as "the rhetorical structures fundamental to various forms of communication in a culture" (Hyland, 2004, p. 29) shares valuable insights for the development of writing curricula for classroom learning. As has already been discussed, a number of scholars and educationalists working on SFL suggest various types of texts that represent genres (see Table 3.4 Example of some genres).

Table 3.4 Example of some genres

Genre	Social purpose(s)	Social location(s)	Schematic/generic structure
Recount	To tell what has happened, or to reconstruct past experience	Personal letters, reports	Orientation – record of events – re-orientation
Narrative	To entertain and make a reflection on a particular experience	Novels, short stories, movies	Orientation – complication – resolution - evaluation
Procedure	To explain how to get something done	Manuals, cookbooks	Goal – (materials) – steps (in order) - results
Description/ information report	To present factual information by providing a classification of things	Brochures, product details	General statement – description of aspects – description of activities
Explanation	To account how and why things happen	Textbooks, News reports	General statements – explanation of sequence
Exposition	To present an argument of a certain case	Essays, editorials, commentaries	Thesis – position – arguments - elaboration – assertion – reiteration
Discussion	To discuss an issue	Essays, editorials, public forums	Issues – argumentation for & against – conclusion

Source: Butt, Fahey, Feez, Spinks, and Yallop (2000); Hyland (2004); Macken-Horarik (2002b)

Gardner and Nesi (2013) argue that the classification of texts can be employed as a tool for "allocating writing tasks across age groups and levels of study on the basis of how well a category suits a learner's development stage", and accordingly can inform the development of instructional materials and syllabi. Specifically, the text type, i.e. description/information report genre, as presented in above suggests the extralinguistic context (e.g. social action and social location) with a set of purposes for using language that can meet the context of the present study (EFL learners in their early secondary schools

(Butt et al., 2000).). As Caffarel states (2006, p. 205) the “emphasis on meaning potential that makes SFL a powerful framework for teaching the grammar of particular languages and applying it to the analysis of the meanings of texts”. The description or information report genre, for instance, employs simple language structures, such as an article, present tense verb, and simple present tense, and these linguistics resources are appropriate for learners who are at the beginning stages of learning English (Butt et al., 2000; Wuillemin, Richardson, & Lynch, 1994, p. 26). It can therefore be said that students who are learning to write can be aided particularly by providing them with explicit knowledge about a variety of texts, their social functions, the schematic structures and language features that develop the texts. With this in mind, the SFL genre framework provides a clear picture of what students need in order to be able to write, and why they need it (Johns, 2011); this knowledge then enables teachers to develop a set of plans for course writing.

Besides informing the goals and the development of writing instruction materials and syllabi, SFL's orientation and view on language has suggested an opportunity for the use of SFL as an instructional framework in classroom practice, particularly in junior secondary school classrooms that are the context of the present study. Text classification, social purposes, social location and schematic stages for text development (that are the SFL conception of genre) clearly articulate a strong orientation of meaning-making through genre as well as the choice of linguistic resources available for learners. Likewise, SFL’s view on language as a social semiotic and a semiotic system makes apparent “the indissociability of language from its context by positing context as a higher semiotic plane which is realized by language” (Caffarel, 2006, p. 208). Several SFL scholars and educationalists, such as Emilia (2005a), Martin, Macken-Horarik and Freez (as in Johns, 2002b) have suggested teaching and learning cycles that help both teachers and students apply the concept of SFL genre in classroom teaching and learning. The teaching/learning cycles employed in this present section are the ones that were developed by the Literacy and Education Research Network (LERN) in collaboration with Sydney’s Disadvantaged Schools Program (DSP), and is often called the Sydney School genre (see Emilia, 2005a; Hyon, 1996; Johns, 2011; Macken-Horarik, 2002b).The cycles include (1) building knowledge, (2) modelling, (3) joint construction of text and (4) independent construction of text. Chapter 4, section 4.6, will

further discuss the teaching and learning cycles along with the reasons for their classroom application in the present study.

Although the SFL genre-approach has informed writing classroom pedagogy and has already been widely adopted in a huge number of education institutions across various nations (e.g. see Caffarel, 2006; Emilia, 2005a; Hinkel, 2011; Hyon, 1996), the application of SFL genre-based pedagogy in L2 curricular and instruction has raised concerns. Many writing scholars, such as Silva and Brice (2004) and Leki (2007) cited in Hinkel (2011) have argued that "genres and their linguistic features may be subjective, culture-bound, vaguely defined, or even irrelevant to diverse types of ESL/EFL learners" (p. 534). This argument indicates that the structure of genres that have already been proposed by the Australian scholars, such as Christie (1991, 1999); Martin (1993) , may only fit the context of Australian schools, specifically, their students' culture, and therefore, it is viable that the Indonesian writing scholars, for example, promote their own text types and the generic structures that meet their students' context of culture. In that ESL/EFL learners - as well as genres and their linguistic features - are socially diverse, the usage of the genre-based approach as a pedagogical tool, as well as its classification of genres and their language features, is apparently restricted to particular contexts, and accordingly it cannot be generalised (see Widdowson, 2003).

Principles in SFL genre-based writing instruction

This present study aims at exploring teachers' and pupils' perception about collaborative writing and the use of technology in collaborative writing activity. The study also is conducted to examine the effect of the use of technology in collaborative writing on writing achievement of junior secondary school pupils. As discussed earlier in chapter 2, SFL genre pedagogy has been adopted as classroom instruction for the teaching and learning of English. Thus, it is important to discuss the underlying principles of SFL genre pedagogy, particularly its practice in writing classroom.

The nature of SFL genre based learning theory puts its main emphasis on the meaning making activities with frameworks of genre to set the context of the meaning making itself. The context of meaning making in the genre framework offers pupils more linguistic features (i.e. grammar) that they may select to help pupils themselves achieve

certain social goals. Thus, in applying the SFL genre based writing instruction to school classroom contexts, there are three primary principles, such as 1) genre (types of text), 2) choices of grammar, and 3) the learning cycle.

The SFL genre based approach considers that language learning is part of social activity (Gebhard, Harman, & Seger, 2007; Martin, 2009). Texts and their genre likely apply to express one's ideas, thoughts, or other intentions, and that at the same time, the texts and the genre reflect social conventions of certain contexts within which they are used to achieve particular goals in social communication (Halliday, 2009; Halliday & Hasan, 1989; Hyland, 2004). In this understanding, genre, which is simply recognised as a group of texts that writers characteristically use to reflect their responses to recurrent circumstances (Hyland, 2008) , is seen as "a staged goal-oriented social process" (Martin, 2009, p. 13). In other words, language in SFL genre pedagogy is viewed to be functional, where language forms are mainly directed to match the intention of the users (Christie, 1999) with certain rhetorical organisations (Hyland, 2002; Martin, 2009). Thus, the first principle seems to undertake the meaning making activity, as well as genre as the main frameworks in instructional classroom writing.

The second principle of SFL genre writing instruction concentrates on the importance of grammar in student writing activity (Hyland, 2008; Paltridge, 2001; Tardy, 2009). The SFL theory seems to posit grammar in engagement with text (Halliday & Matthiessen, 2004). In such a position, grammar (or said as functional grammar) is functionally applied to construct meaning from the text (or language) used within a social interaction framework (Eggins, 2004; Halliday & Matthiessen, 2004; Martin, 2012). Gebhard et al. (2007) view that grammar and language learning is to be firmly revealed from a social perspective offering ranges of linguistic choices that pupils may select to accomplish certain social goals. Further, Hyland (2008) states that grammar may provide a number of recourses for text production for writers to select to "achieve particular purposes in particular contexts" (p. 558).

It seems to be obvious that most text types entail grammar (see Boardofstudies, 2007; Hyland, 2003b, 2009; Paltridge, 2001). For example, the Board of studies (2007) highlight the importance of the past tense in the construction of recount and narrative texts, and the present tense for information reports. By concluding that grammar is functionally driven by the construction of meaning (Eggins, 2004; Halliday & Matthiessen,

2004; Martin, 2012) as discussed earlier, the teaching of grammar within SFL genre writing instruction framework is therefore encouraged in connection with meaning making activity in the context of the genre with which pupils are dealing (Hyland, 2004). In addition, Martin (2012) suggests that the understanding of the role of grammar in SFL genre writing instruction may be valuable for teachers in scaffolding the pupils' writing activities.

The last principle concerns the application of the SFL genre learning cycle which covers instructional procedures. Writing activity in SFL genre pedagogy is taught in three stages: modelling, joint construction of text and independent construction of text (Hyland, 2003b, 2008; Hyon, 1996; Macken-Horarik, 2002a; Paltridge, 2001). Hyland (2004) views that the three stages as reflections of the SFL genre pedagogy scaffold for writing activities. The modelling stage is seen as a basic scaffolding activity where both teachers and students are involved in discussion of genre knowledge, genre grammar, as well as rhetorical features at an appropriate level for the students (Hyland, 2003b, 2004). In the next cycle, the joint construction of text provides opportunities for students to construct their own text with assistance from the teachers, as well as other peers. Hyland (2004) adds that the joint construction of text stages may be directed at collaborative writing activity, for the stage would likely decrease the teachers' role and motivate students to work in groups. Finally, the independent construction of text is used for students to apply what they have learned about genre as well as their earlier experience from the joint text construction stage.

Studies related to the SFL genre approach to writing

Several studies have been conducted to explore the application of the SFL genre approach in writing classrooms, particularly in the context of Asian countries where English is a second or foreign language (e.g. Emilia, 2005a; Kongpetch, 2006; Myskow & Gordon, 2010; Payaprom, 2012; Pujianto, Emilia, & Sudarsono, 2014; Widodo, 2006; Yasuda, 2015). Yasuda's (2015) study explores the genre awareness and meaning making choices of Japanese undergraduate students in the development of summary writing. Yasuda surveyed 10 students before and after study to get insights about their awareness and perceptions of genre. She also evaluated the students' summary writings. The study found that when informed of SFL genre analysis, the students could interact with ideational, interpersonal and textual meanings. The findings also showed the changes in students' lexicogrammatical

choices. Such changes help them to recognise the genre, and accordingly enabled them to grammatically elaborate sophisticated expressions. The study therefore suggests that the SFL framework can facilitate genre-specific language learning and enhance the foreign language development of students.

Kongpetch (2006) evaluated the usage of the SFL genre-approach to teach exposition writing to Thai university students. The study employed an ethnographic case study. The study found that students were able control their genre generic structure and that they could appropriately employ language resources relevant to the type of text they developed. Payaprom (2012) examined the impact of the genre-based approach on English language teaching in a university context. The study had 14 participants who were students majoring in English at the Chiangrai Rajabhat University. Adopting a qualitative design with a ten-week teaching cycle, the study found that the SFL genre-based approach promoted the students' English literacy development. The approach helped the students better understand texts. Such an understanding enabled them to gain control of the review genre and achieve social objectives from the genre.

The SFL genre-approach to the teaching of writing is also evident in Indonesian EFL classrooms (e.g. Emilia, 2005a; Megawati & Anugerahwati, 2012; Pujianto et al., 2014; Roni, 2006; Widodo, 2006). In a university context, Emilia' s (2005a) study focuses on the effectiveness of using a critical genre-based approach to teach student teachers to write academic text. The findings of the study suggest positive outcomes from the application of the SFL genre-approach. Students were reported to be able to control the target argumentative genre, and that they were able to produce argumentative texts with a clear schematic structure. It was also observed in the study that students were able to use linguistic resources relevant to the argumentative genre.

In the context of secondary schools, Megawati and Anugerahwati's (2012) study investigated the use of comic strips in the teaching of writing narrative texts. The use of comic strips was proposed as it provides opportunities for teachers to "present content, organisation and grammatical aspects of narrative texts" (p. 183). Using an action research design, the study evaluates student participation in classroom activity and their writing performance. The findings of the study show that comic strips provide learning motivation

for the students, help students with vocabularies, and more importantly, they facilitate student understanding of the schematic structure of narrative texts.

Pujianto et al. (2014) examined whether the teaching cycles applied by teachers can facilitate students to write report texts. The study employed a case study design with the researchers taking the role of teachers as well as participant observers. The study found that the SFL genre approach to writing instruction facilitates students in the development of report texts, particularly with regard to student knowledge of genre, writing process and peer feedback. The findings of the study also highlighted that low-achieving students spent more time in modelling and teacher-student conference stages in order able to comprehend the schematic structure of the report genre and apply it in their writing.

The previously mentioned studies suggest that the SFL genre approach fits and benefits EFL writing classroom instruction, particularly in an Indonesian classroom context. The use of the SFL genre approach in writing classrooms helps learners to better understand genre, its schematic structures and linguistics resources relevant to the genre. Such an understanding accordingly enables EFL learners to gain control of the specific genre they develop. Despite the benefits, the SFL genre-approach in Indonesian classrooms has raised two main concerns. First, teachers felt that the practice of the SFL-genre approach in writing classrooms is time consuming (Widodo, 2006). Although some authors (e.g. Callaghan, Knapp, & Noble, 1993; Hyon, 1996) have suggested that teachers may employ the teaching cycles flexibly, that teachers can begin with a stage "that best meets students' needs" (Callaghan et al., 1993, p. 182), teachers rigidly applied the cycles and accordingly they spent a lot of time in order to complete all of the stages. Such a rigid application of genre is particularly shown in Pujianto et al.'s (2014) study. This condition, of course, prevents teachers and students from learning optimally from each of the cycles. Second, teachers perceive that the schematic (generic) structure as proposed in the SFL genre-approach is the most important element that genre students need to comprehend. Such a view is misleading, and teachers then regard the teaching of writing as the teaching of the schematic structure of genre (see Puskur, 2007). Moreover, as reported in Puskur (2007), teachers carried out the teaching of the schematic structure in the way they teach grammar.

The two concerns derived from the practice of the SFL genre-approach in Indonesian classrooms as discussed above have indicated that the previous studies do not successfully

inform teachers about the SFL teaching cycles, and how they should apply the cycles with flexibility. In other words, teachers need to be informed about a specific stage in the SFL teaching cycles and viable classroom activities that they can employ within that specific stage. The present study attempts to fill this gap by focusing on the specific stage of joint-construction of the text as part of the SFL teaching and learning cycles. It explores students' collaborative writing activities and their perception of them in the development of descriptive texts with technological support. The present study, therefore, helps teachers to better understand how students benefit from the joint construction of text stage and from the use of technology within the stage.

3.2 Theoretical framework of collaborative learning activity

A body of literature on collaborative learning has suggested sociocultural theory (henceforth SCT) as a theoretical framework underpinning the practice of collaborative activity in language learning classrooms. This section centres on the discussion of sociocultural theory and its practices in language learning classrooms. The section is divided into three sub-sections. The following sub-section 3.2.1 explains SCT and its two main concepts: zone of proximal development and mediation. The practice of SCT in language learning classrooms is discussed in Sub-section 3.2.2 and Sub-section 3.2.3 explains the practice of collaborative learning in writing classrooms.

3.2.1. Sociocultural theory

Sociocultural theory, also known as Vygotsky's theory of mind, places its main concern on the connection between the development of an individual's cognitive functions, as well as his/her mental functions, and his/her social interaction (Swain, Steinman, & Kinnear, 2011).The theory suggests that the way humans interact with others socially in a community, and what they produce to accomplish certain goals during the social interactions are likely to determine the way they think (Lantolf & Thorne, 2006b; Poehner & Lantolf, 2008). Within this view, social interaction plays a salient role that contributes to the cognitive development of its community members (Thorne, 2005; Zuengler & Miller, 2006).

In providing clear understanding of sociocultural theory, two concepts of SCT theory are discussed below:

Zone of proximal development (ZPD)

The Zone of proximal development (hereafter ZPD) originally appears in Vygotsky's proposal that processes undergone in an organisation of instruction may affect a pupil's aptitude (Lantolf, 2000b). In Vygotsky's definition, ZPD is understood as the differences between what can be achieved by an individual, with or without any support from other people in the community (Johnson & Golombek, 2003; Lantolf, 2000b; Zuengler & Miller, 2006). This environment in which people receive or do not receive help to accomplish certain tasks in their community is also understood as "the constructive zone" (Newman, Griffin, and Cole, 1999:2 cited in Gibbons, 2003). The zone is likely to draw individual development processes within certain circumstances in his/her social interactions (Marx & Engels, 1973 cited in Lantolf & Thorne, 2006a). In other words, the ZPD highlights an engagement of humans and their dynamic participation in a certain community to bring them into their own development (Poehner & Lantolf, 2008).

Mediation

Some authors (e.g. Duff, 2007; Lamy & Hampel, 2007; Lantolf, 2000b; Lantolf & Thorne, 2006) provide some fundamental points relating to sociocultural theory. They see that sociocultural theory mainly puts its emphasis on human mental development. According to Lantofl (2000b), human develop their mental capacity through social interactions with other community members. In other words, human mental function seems to be naturally born from their involvement in social interactions (Wertsch, 1991 cited in Lamy & Hampel, 2007).

Sociocultural theorists believe that man does not seem to directly make responses towards social interaction, but rather needs assistance (Lantolf, 2000a). This belief raises the issue that the development of human mental functions is seemingly mediated (Duff, 2007; Lantolf, 2000a). The assistant, which is reflected in the form of mediation, is likely to be undertaken as a bridge among humans, their interactions and their mental activity. Edwards (2005), Lamy (2007), Lantolf (2000a, 2000b) suggest some symbolic mediation tools, such as symbols (language), social beliefs, social institutions, and physical mediation tools such

as software, and also suggest that humans themselves help them interact. The connection between humans and their interactional goals is seen in following figure:

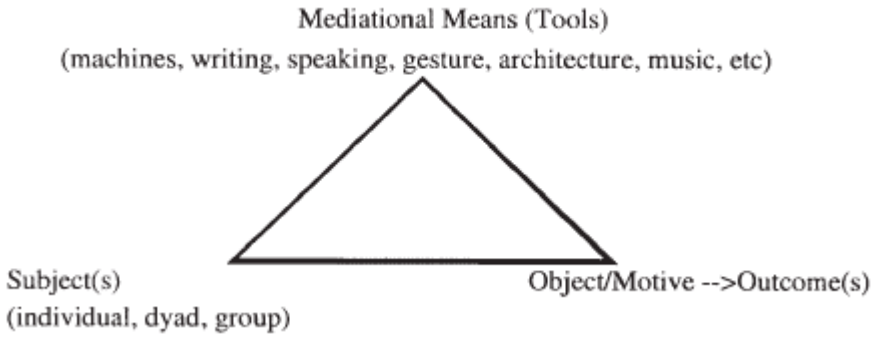


Figure 3.2 Mediation role, adopted from Edward (2005)

The innovation of information and communication technology such as computers offers more mediation benefits for humans and their interactional activities. Functionalities of computers, such as browsing, tools for designing, manipulating, displaying, sharing, and others seem to affect human interaction particularly in suggesting meaning-making resources (Lamy & Hampel, 2007). In this present study, human mediation is aimed at language learning activity, or the way humans create meaning through signs in a social interaction. The functionality of computers particularly related to the computer application is thus believed to promote the computer as a mediation tool that benefits such processes of language learning.

3.2.2. Sociocultural theory in language learning classrooms

The engagement of social interaction with cognitive development has been viewed as the application of sociocultural theory in teaching and learning practices (Cleghorn & Rollnick, 2002). This sociocultural perspective views how language is used in "real-world situations as fundamental, not ancillary, to learning" (Zuengler & Miller, 2006, p. 37). According to Zuengler & Miller (2006), as learners are attached to a social community and afford themselves of a learning process, they likely shape their competence in a communicative context, which seems to influence the way they understand and make use of language to interact.

In their study of L2 learning, Iddings and Jang (2008) viewed that the more flawed the connection between demands from the social community and available language to the pupils, the more it opens room either for successive or chaotic restructuring of linguistic attributes. Iddings and Jang's study shows that the range of interaction provided in social communities has assisted learners "to create and express meaning in the L2" (p. 586). However, the study has shown that the exposure to varied social interactions that are claimed to assist L2 learners does not seem to facilitate learners developing academic competence. Iddings and Jang (2008) suggest that the issue of intention "may pose considerable challenges to L2 learners in their quest for reconciling the learning of content" (p. 586).

The applications of sociocultural theory in language learning adopted in this present study are: scaffolding (Rasmussen, 2001; Swain, Steinman, & Kinnear, 2011; Verenikina, 2003), situated learning and community of practice (Lamy & Hampel, 2007; Lave, 1991; Wenger, 2000), and collaboration (Esquinca, 2011; Lamy & Hampel, 2007; Lantolf, 2000b).

Scaffolding

Some authors (e.g. Rasmussen, 2001; Swain et al., 2011; Verenikina, 2003) suggest that the ZPD (zone of proximal development) is the heart of what is called "scaffolding". The ZPD highlights the gap between what learners can do without help and what they can do with the assistance of others, such as their social community (Lantolf, 2000c; Swain et al., 2011; Verenikina, 2003). Scaffolding itself is an abstract concept. Rasmussen (2001) views the notion as a metaphor "for support of learning processes". Although scaffolding is a metaphor, many educators have been underpinning their classroom teaching strategies with this scaffolding metaphor (Verenikina, 2003).

The term scaffolding originally appeared in Wood, Bruner and Ross's 1976 study. The authors viewed it as a process that "enables a child or novice to solve a problem, carry out a task, or achieve a goal which would be beyond his unassisted efforts" (Wood, Bruner, & Ross, 1976, p. 90). This view of scaffolding refers to the assistance or support given by people "for the development and learning of children and young people" in a social community (Rasmussen, 2001, p. 570). The notion of scaffolding also reflects the relationship between expert and novice, for the development of the novice (Donato, 1994).

In this understanding, scaffolding, which firmly draws on the engagement between learners and the community to facilitate the learning process (Rasmussen, 2001), is expected to not simply assist learners about what to do but help them "know how to do" (Gibbons, 2003, p. 249).

Some studies (e.g. Arifani, 2016; Cotterall & Cohen, 2003; Fitriani and Cahyono, 2012; Kepner, 1991) have examined the application of scaffolding in classroom practice, particularly in areas of teaching and learning L2 writing. Cotterall and Cohen's (2003) study in the teaching of English in a university context applies scaffolding to facilitate students to produce English academic essays. Their study is claimed to be successful in driving the main attention to scaffolding. From the results of the study, Cotterall and Cohen (2003) suggest that development of students' academic writing could be facilitated through guidance in areas of topic development, writing development, finding resources, focus on the writing content, extensive modelling during the process of writing, language awareness, and finally peer and teacher feedback. Although the study seems to be biased in the way it focuses on improving the teaching of writing in a particular environment, as well as the researchers' subjective interpretation of the data collected, the scaffolding features presented in the study appear to offer flexible support for students, reflected in students' peer-to-peer and peer-to-teacher interactions. The sort of support provided in Cotterall and Cohen's (2003) study firmly corresponds with Swain et al.'s (2011) view, which indicated that scaffolding may be done with or without classroom teachers, suggesting that "student-student scaffolding can be powerful".

In a study, Kepner (1991) investigated written feedback and students' skill development in second language writing. Two different types feedback were assigned to students' journal writing over a one semester course, including error-corrections and message-related-comments. The findings showed that a message-related comments type of written feedback significantly affect the accuracy of students' writing compare to its counterpart, error-corrections of written feedback. This findings indicated that guidance and advice given by teachers may contribute to better writing achievement. In other words, teacher-student scaffolding can positively affect students' achievement.

In Indonesian classroom context, Arifani (2016) investigated the implementation of student-student scaffolding called "team-based discovery learning" when writing research

proposal. Using an action research, Arifani observed thirty university students collaborative activity in pre-, while- and post-writing stages. Data from group portfolio and student's individual writing were also collected. The findings of the study showed that students' ability improved over an intervention. Students were found to take benefit from group discussion, group reading and group interaction.

Fitriani and Cahyono (2012) conducted a study investigating the effectiveness teacher-students scaffolding of big-book and narrative during writing process on students' writing achievement. A total of 48 students participated in the study where they were assigned into two experimental and control groups. Two data collecting instrument were employed in the study, such as writing tests and questionnaire. Findings of the study showed that student who received big-book and narrative scaffolding had significant improvement on their writing achievement compared to those who did not. Particularly, students made a significant improvement on the writing aspects of content, organization, grammar, vocabulary and mechanics.

The studies above seem to provide three salient points about scaffolding. First, scaffolding may be used in collaborative writing as it is beneficial to helping pupils work at their own pace with the guidance of others (Cotterall & Cohen, 2003; Kepner, 1991; Rasmussen, 2001). Second, peer-to-peer scaffolding may be seen as flexible (Cotterall & Cohen, 2003) as well as powerful (Swain et al., 2011) in facilitating pupils' learning processes. However, as scaffolding is widely interpreted in many different ways (Verenikina, 2003), this flexibility of scaffolding may imply the level of experience that pupils have (Daniels, 2001). Teachers' assistance has been seen to facilitate pupils' writing development, yet teachers' written responses to students' writing does not seem to suggest more room for student collaborative learning (Thrap & Gillmore, 1998 cited in Patthey-Chavez et al., 2004). Third, scaffolding in the previous studies (e.g. Cotterall & Cohen, 2003; Kepner, 1991) has been applied in the context of paper-based writing. The transformation of paper-based writing into electronically mediated writing using computers may be an issue if the scaffolding metaphor is also transferrable to this environment.

Situated learning and community of practice

"Situated learning" and "community of practice" are two different notions, yet come from the same concept of sociocultural theory, reflecting that human development is engaged by activity and interaction in the community where people live. The notion of situated learning is remarkably characterised by Lave's (1991) study. In his notion of situated social learning (also known as "situated learning") Lave views that "agent and world, activity, meaning, cognition, learning and knowing" share inter-reliant engagement (p. 67). Within such engagement, knowledge is created during the shared interaction between individuals and community members, while learning is carried out by the individuals through their involvement in the social community (Lamy & Hampel, 2007).

The other notion, "community of practice", is viewed as the collection of people who create communities that "share cultural practices reflecting their collective learning" (Wenger, 2000, p. 229). According to this perspective, Wenger (2000) suggests that members of a community may share a common goal, and share their experiences through interactions that finally develop a convention related to their community. Lave (1991) explains that community of practice is mainly a product of timely, common, shared, and knowledge organisation by which the creation of group identity is "both a result of and motivation for participation" among group members(p. 71)(p. 71)(p. 71) (p.71).

Some authors have noted the contributions of these two notions in language-learning activity. For example, Oxford (2003) in her discussion of learning styles and strategies states that the concept of situated learning places learning in a certain context with either teachers' or pupil' interaction displaying a valuable picture of the learning participants as well as the characteristics of the process undergone in L2 teaching and learning practices. From the perspective of ICT advanced development, the concept of community of practice is likely to apply to computer-mediated language teaching and learning environments (Lamy & Hampel, 2007; Schwen & Hara, 2003). Further, in applying the concept of situated learning as well as community of practice, Edwards (2005) suggests that the process of learning should be well examined in order to provide pedagogical support for the learning process. He adds that the application of the two concepts is expected to provide more room for learners to interpret and make responses from actions or any interactions occurring in the community.

Collaborative learning

Vygotsky's sociocultural theory has drawn a strong engagement between individual development and the social community where the individual belongs. The ZPD has brought the idea that individual internal growth, either cognitive or mental development, may be stimulated only if the individual interacts with people within his/her community as well as gets together with them to complete particular tasks (Lamy & Hampel, 2007). As the development of the novice from lower levels of competence into the higher levels is facilitated by more expert members through scaffolding (Storch, 2005), there are two activities to draw in this context: individual and collaborative (Van Lier, 2008). These two activities seem to stand as social interaction counterparts such as within the classroom environment, whereas students are involved in collaborative work to experience scaffolding from other members (Donato, 1994; Storch, 2005).

The term "collaboration" is simply viewed as shared responsibility (Storch, 2005) where some people gather to complete particular tasks (Lamy & Hampel, 2007). Unlike a number of goals pupils achieve in the cooperative environment (Oxford, 1997), collaborative work puts pupils into groups, working together to achieve a common goal (Marcos, 1997 cited in Lamy & Hampel, 2007). Teufel, Sauter, Muhler and Bauknecht (1995 cited in Riemer, 2009) characterise the goal in collaborative activity as similar. Pupils engage with others who have more competence in order to obtain assistance as well as guidance (Oxford, 1997).

From the SCT perspective, writing is believed to be developed in a collaborative environment (Esquinca, 2011). As language is viewed as social semiotic (Halliday, 1993; Halliday & Hasan, 1989), obtaining language seems to be activity that places its main emphasis on making meaning (Byrnes, 2009). Suthers (2006) states that learning exists in environments where learners make efforts during the process of making meaning, even though teachers (or learners) may suggest any intervention during such a process of learning in order to facilitate or accelerate the achievement of goals (Suthers, 2006). This engagement between learners and other parties (teachers, or other learners) in achieving similar goals during the making-meaning process is viewed as collaborative language learning (Lamy & Hampel, 2007; Suthers, 2006). Thus collaboration in L2 contexts concerns

how interaction amongst language learners is naturally promoted to meaning negotiation under certain interests and concerns, as well as the role of the learners (Foster & Ohta, 2005).

Recent studies have found that collaborative learning, in particular collaborative language learning, provides benefits for both teachers and pupils. For instance, Cekaite and Aronsson's (2005) study has shown that language play, used as a collaborative learning resource, not only provides an enjoyable learning environment but also emphasises the formal aspects of language. Language play, which facilitates collaborative learning, provides valuable information for teachers by indicating pupils' problems, particularly phonological and morphological aspects.

In addition, Watanabe and Swain (2007) investigated the effect of students' language proficiency differences in pairs and the interaction pattern they made on L2 learning. Twelve Japanese participated in the study were assigned into pairs with mixed language proficiency level (lower, intermediate and higher). These group participants engaged in three stage writing tasks: "pair writing, pair comparison (between their original text and a reformulated version of it) and individual writing" (p. 121). Data collected from students' collaborative dialogue and students' individual writing were analysed. The study found that pattern of students' interaction significantly affected the frequency of language learning episodes and students' performance at the post-test. More importantly, students who engaged in interaction tended to achieve better score at the post-test regardless of their partners' level of language proficiency. What interesting from the study is that Watanabe and Swain (2007) arranged the pairs of the same gender. This was due to cultural aspects of the Japanese people. By citing Gass and Varonis's (1986) findings, Watanabe and Swain (2007) argue, in mixed-gender composition, "Japanese men seem to dominate conversations when working with women" (p. 125). Although, the Japanese's perspective about gender differ from the Indonesian's, this present study has taken this gender issue as one consideration when arranging students into groups.

3.2.3. Collaborative learning in writing classrooms

It has been discussed earlier that collaborative learning has been viewed to offer benefits for both teachers and students (see Cekaite & Aronsson, 2005; Watanabe & Swain, 2007). In addition to this view, some studies (e.g. Kim & McDonough, 2011; Storch, 2005) have been conducted to show the application of collaboration in L2 writing contributes to pupils' writing development. Holmes (2003) explores students' paired work in collaborative academic writing in a Malaysian university. In the study, Holmes focuses on the strategy used by students when deciding either to work collaboratively or individually. The study, which employed a project-based approach, showed that students involved in pair work tend to produce better projects and have better results on the final exam of the course. In addition, the study suggested that collaborative work (as well as reducing workloads) might promote positive learning attitudes as students obtain experience while working with others.

Kim and McDonough's (2011) study evaluated the influence of using pre-task modelling on EFL learners' collaborative learning activities. They argued that pre-task modelling supported collaborative activity by which dynamic interaction engaged students in completing their tasks. The results of the study showed that the use of pre-task modelling promotes collaborative activity among language students. However, the study only provides information about the writing session, generating little information about how language promoted by pre-task modelling may provide benefits to students' writing development.

Another researcher, Storch (2005), investigated students' pair work to examine how it developed joint writing texts in an Australian university. Storch sampled participants from a number of language backgrounds, with the majority being from Asia. Although the study showed that individual writers seemed to produce longer texts compared with the students working in pairs, the study suggested that the texts produced by the students in pairs were likely to be more accurate, as well as more complex, than the individual texts. Storch argued that the students in pairs spent more time developing their writing, particularly in dealing with the clarity of ideas as well as the language used.

The number of studies in collaborative writing in the L2 learning classroom, as shown above, has revealed the application of collaborative writing in a traditional classroom environment. In this application, technology does not seem to be seen as having the

potential to benefit the learning activity. Recent developments in technology have provided more rooms for the integration of technology for collaborative activity, in particular in L2 writing. The following section on electronic collaborative writing (e-collaborative writing) further discusses this issue.

3.3 Computer use in collaborative writing

The use of computers to mediate collaborative learning is widely known as "computer-mediated collaborative learning", or in short CMCL (Lamy & Hampel, 2007; Warschauer, 1997), and "computer-supported collaborative learning", or CSCL (Alfonseca, Carro, Martín, Ortigosa, & Paredes, 2006; Chan & Chan, 2011; Larusson & Alterman, 2009). These two well-known methods for using computers to facilitate collaboration in learning are particularly derived from the application of a "collaborative hypermedia-based system" (Alfonseca et al., 2006, p. 382) or access to "media-based information through networks" (Ayersman, 1996). The networks in Ayersman's view particularly refer to communities in which pupils get together and agree to achieve particular goals through collaborative activity in a system. Thus, any application to convey collaboration using computers is believed to integrate "a learning activity with collaborative environment" (Larusson & Alterman, 2009, p. 372) either in real-time mode of communication (synchronous) or different-time mode (asynchronous) (Lamy & Hampel, 2007; Larusson & Alterman, 2009).

The term "e-collaboration" in this study similarly refers to collaboration either mediated or supported by electronic equipment such as computers (Dasgupta, Granger, & McGarry, 2002; Lamy & Hampel, 2007; Riemer, 2009). The use of the term e-collaboration seems to be specific to portraying "practices of communication, coordination and collaboration between people in distributed contexts, such as projects ..." (Riemer, 2009). Within this context, Riemer (2009) suggests that e-collaboration may provide greater room for people to work collaboratively to communicate, agree on group schedules of task completion and management, and finally work together within a shared space or other facilities provided by the computer system such as email, text chat, online calendar, wikis and other shared workspace systems. As a form of collaboration, e-collaboration is directed to achieve the same goal "in a self-managed way using ICT" (Ardil, 2007).

3.3.1 Online collaborative learning discourse and L2 writing

Many online collaborative tools such as chat, forum discussion and email exist in text-based discourse, "although multimedia tools such as audio, video, animation and even avatars may be incorporated into online course activities and discourse" (Harasim, 2012). In this discourse, Harasim (2012) shows that text or writing is firmly used as a tool to construct knowledge, as it is believed to be a strong representation of people's ideas. The use of computer technology to facilitate collaboration in L2 writing is mainly suggested because technology makes the activity of drafting and revising easier (Levy, 2009).

Several studies have conducted on the use of technology to facilitate collaborative activities, particularly in writing classroom. Taki and Fardafshari (2012) examined the use of webog to facilitate EFL learners' writing and motivation of 80 university students. Using an experimental design, these students were assigned into two groups: experimental and control groups. Findings of the study showed that students who attended weblog based-collaborative writing activity had significant improvement on their writing compared to those who did not. The findings showed that students' aspect of writing improved on the aspects of "sentence length, sentence structure, and creativity in writing" (p. 420). The study also found that students' motivation to learning English writing noticeably increased.

In addition, Coniam and Wong's (2004) pilot study investigated the potential use of online chat to help 26 primary pupils (from grades 7–10) to develop their English language. The study found that the computer was seen as a motivating factor and was shown to advantage learning. Though the study did not show a quantitative difference between the experimental group and the control group in the error rate of grammar in pupils' writing, it suggested that the use of online chat via IRC (Internet relay chat) helped pupils develop complex sentences, as shown by the experiment group. The lack of quantitative data in demonstrating pupils' grammatical errors was determined by two different situations that pupils were required to attend. Whilst the online chat demanded that pupils exchange ideas in "written text quickly", samples of pupils' writing collected before and after the study unfortunately did not reflect a similar environment.

Furthermore, Janssen, Erkens, Kanselaar and Jaspers (2007) investigated the use of a participation tool in computer-supported collaborative learning. Under the experimental

design, the study attempted to confirm its hypothesis that visual participation facilitated by a participation tool could contribute to better computer-supported collaborative learning. The result, unfortunately, does not confirm the hypothesis. Although the result of the study claimed that visualisation of participation suggested the success of the computer-supported collaborative tool, it showed that there was no difference between the control and experimental groups in the study in terms of the process and the experiment group's product.

With the advance of the World Wide Web (or "www"), Web 2.0 technology since 1990 has provided more room for e-collaboration. Web 2.0 technology seems affordable, providing more interface features that suggest wide social interaction (Rollet, Lux, Strohmaier, Dosinger, & Tochtermann, 2007; Wheeler, 2009; Wong, Chen, Chai, Chin, & Gao, 2011). The following section evaluates the use of wikis as an e-collaborative tools in writing activities.

3.3.2 Wikis as e-collaborative writing tools

The term 'wiki' (or plural 'wikis') literally means *quick*. The term came originally from the Hawaiian phrase *wiki-wiki* (Parker & Chao, 2007). In relation to technology, wikis are a Web 2.0 application, a publicly accessible social tool facilitating users' joint development of content on the web (Alexander, 2006). They are recognised as a powerful tool for collaborative learning (Larusson & Alterman, 2009; Parker & Chao, 2007).

The use of wiki technology for collaborative learning – referred to in this study as 'e-collaborative CALL' – has been a topic of investigation for years, particularly in second-language (L2) learning. Studies have investigated pupils' attitudes to the use of wikis (e.g. Wong et al., 2011) and specifically their use as tools for e-collaboration to develop pupils' writing (e.g. Mak & Coniam, 2008; Woo et al., 2011). In exploring pupils' attitudes to collaborative writing mediated by wikis, Wong et al.'s (2011) pilot study investigated their use within a blended collaborative writing framework. A survey was conducted before and after interventions using wikis in e-collaborative writing sessions. A t-test analysis was carried out to identify any changes in pupils' perceptions of wiki use, and the results show that pupils seemed to have positive perceptions and believed that by using wikis they could help others to develop their writing.

Using a wiki application in a collaborative writing activity, Woo et al. (2011) investigated how wikis help teachers scaffold primary school pupils in e-collaborative writing. The study of 38 pupils examined the application of a scaffolding platform for sharing of peer feedback and joint construction, as suggested by Richardson (2009, cited in Woo et al., 2011) in a primary school in China using e-collaborative tools such as wikis. These 38 pupils were arranged into groups of mixed gender and language ability. They attended six weekly collaborative writing activities in which they were asked to co-construct their text, and exchange feedback and comments among group members on a wiki webpage. The results show that groups of pupils who were active in e-collaborative activity, such as making comments and revising their work, tended to produce better writing than less active ones. In addition, it was found that both pupils' and teachers' positive perceptions seemed to motivate their involvement in e-collaboration. This finding confirms a previous study by Chan and Chan (2011) relating to perceptions and successful learning in an e-collaborative environment. However, their study tended to favour group rather than individual writing development. There also seems to have been a disconnect between the scaffolding platform and the genre-based framework used in the study, since it applied Richardson's scaffolding platform, which is actually designed for university students. In fact, the genre framework (Systemic Functional Linguistics, or SFL), which was developed by a Sydney school, seems to offer a better solution as a scaffolding platform for primary school pupils. In language-learning classrooms, the SFL genre pedagogy enables teachers and students to scaffold their teaching and learning activities. For example, the modelling stage helps students obtain knowledge about a text (e.g. descriptive text) and its sentence structure and organisation. In the joint construction of text, the SFL genre pedagogy enables students to write collectively, while also giving them opportunities to work independently to apply their knowledge to individual writing.

Issues relating to the application of wikis to develop primary school pupils' writing in asynchronous collaboration were also investigated by Mak and Coniam (2008). The authors claim that the asynchronous situation in the study provided more opportunities for pupils to meet in virtual environments and work without time constraints. Their study of 24 Year 7 pupils showed that peer reviews during collaborative activities mediated by wikis were effective in minimising grammatical errors in the writing, as well as increasing creativity.

However, two factors appear to have biased the results of their study. First, it did not control for external factors contributing to pupils' work. As the online web system offered opportunities for pupils to learn out of school hours (Kerawalla & Crook, 2002; Turvey, 2006), there was a greater possibility of intervention by external parties. Second, the publication session in the study (see Mak & Coniam, 2008, p. 449) seemed to contribute psychologically to the pupils' achievements, motivating them to write more carefully as they knew that a number of people, including their parents, might see their work.

The recent study presented here aims to investigate some gaps in the literature on the use of wikis to develop pupils' writing. First, while e-collaboration seems an obvious way to engage with other types of informal communication and interactions through text chat, instant messages and other formats (Riemer, 2009), previous studies of wikis do not seem to have discussed pupils' informal interactions with others during their completion of collaborative tasks through wikis, which may affect their writing development. For example, they may chat and talk informally during collaborative activities, particularly to reassure themselves in their work. Alfonseca et al. (2006) highlight the need for e-collaboration environments to be comfortable to allow pupils to communicate as well as discuss their ideas. Previous studies (e.g. Cotterall & Cohen, 2003; Kepner, 1991; Olson & Land, 2007) have shown that scaffolding facilitates pupils' writing development in L2 learning. Woo et al.'s (2011) study transforms the scaffolding metaphor from the classroom atmosphere into a virtual environment. In addition, their study shows that the application of the scaffolding platform suggested by Richardson (2009, cited in Woo et al., 2011), with joint work, peer feedback and co-construction in a wiki environment, is appropriate for primary school pupils for whom English is treated as a second language. In this regard, Woo et al.'s (2011) study informs the present investigation of group arrangements that promote interaction in collaborative writing activities. In particular, Woo et al. suggest mixed-language ability and mixed gender group composition.

Many previous studies have shown that applying wikis to L2 learning encourages both process-oriented and reader-oriented writing (Parker & Chao, 2007; Woo et al., 2011). Previous studies (e.g. Mak & Coniam, 2008; Woo et al., 2011) tend to emphasise e-collaborative work produced by pupils through the application of wikis. The tracking system provided by wikis may provide assistance to scaffold primary school pupils in their e-

collaborative writing and justify pupils' writing development. The latest studies seem to focus more on pieces of writing that are produced as part of collaborative writing. However, few studies have examined the process rather than the product of collaborative writing. In this study, interviews with teachers and focus groups were carried out to explore teachers' and students' perceptions of collaborative writing activities, and particularly the writing process in a collaborative environment.

3.3.3 Factors affecting the use of technology in language learning classrooms

Technology affordance

The notion of affordance was originally introduced by Gibson (1979), suggesting choices of action that individuals are likely to make in response to the opportunities and limitations of the environment in which they live (Gibson, 1979, cited in Lamy & Hampel, 2007; Levy, 2009). Colpeart (2006) examined the choices of tools that humans use to help them achieve particular goals in their living environment. As a potential tool, technology may be viewed as "materials and conceptual (or ideal) aspects of human goal-directed activity", which may supplement and enhance people's abilities to carry out certain tasks or individual goals (Lantolf & Thorne, 2006b, p. 62). The technology affordance in an L2 learning context is thus viewed as the capacity or potential use of technology to facilitate language teaching and learning (Colpeart, 2006; Levy, 2009). In other words, technology affordance may reveal various types of technological possibilities for teaching and learning purposes (Ajayi, 2010).

Technology affordance in language learning seems relevant to the present study in three areas suggested by Parks et al. (2003, pp. 38-40): computers, multiliteracies and collaborative processes. The topic of computers in technology affordance engages with the type, place and accessibility of computers for learning. Although Sandholz, Ringstaff and Dwyer (1997, cited in Parks et al., 2003) suggest specific locations in which computers can physically be accessed, the development of portable computers has provided alternative solutions to this barrier, as shown by Lin and Wu's (2010) study. Similarly, the type, place and accessibility of computers as a technology affordance may be reflected in features that they offer (Hampel, 2006), or in computer operating systems, which Lamy and Hampel (2007) label as "computer software" (also "computer applications"). Stuzmann et al. (2006) state that this feature of computer applications is likely to be adaptable and able "to be tailored to meet individual needs" (p. 625).

Despite the values offered by computer affordance, the availability of computers as a reflection of technology affordance in a classroom setting does not always seem to benefit L2 teaching and learning when the computer technology is located separately from the context of the language teaching or is not integrated into the learning syllabus (Baylor & Ritchie, 2002). For example, Albirini's (2006) study shows that despite teachers' recognition of the benefits of computer use for teaching and learning practices, as well as their moderate access to the technology, their attitudes to using computers remained neutral. Such attitudes were driven by teachers' doubt about whether using such technology fitted with the learning syllabus.

Besides the disconnect between technology use in the classroom and the learning syllabus, reduced control when practising with technology in classroom teaching and learning may also generate problems such as disruptive behaviour. For example, in Lin and Wu's (2010) study, the use of netbooks in English classroom teaching and learning merely promoted the destruction of pupils' learning, as a number of participants were tempted to access gaming resources rather than their learning materials. The authors found that pupils were still worried about the English exam in the final session of their study. Using netbooks during the learning sessions was seen to have failed to encourage pupils to learn conscientiously.

The second area of technology affordance is multiliteracies. This issue has been widely discussed with reference to the development of technology that offers more room for pupils to experience their learning (Ajayi, 2010). In language teaching practices where the focus is mainly on enabling pupils to make meaning, the notion of multiliteracies means that pupils have opportunities to make use of a range of available language resources such as images, sounds and other digital modalities (Lamy & Hampel, 2007; Unsworth, 2001; Vincent, 2001). In such a digital environment, the language used suggests other types of text with particular conventions and communicative forms (Luke, 2000, cited in Lamy & Hampel, 2007) through which making meaning is more likely to correspond with the context of the existing technological environment. This raises similar issues to those investigated by the present study relating to the context of meaning-making activities on the basis of the technology used for collaborative writing. Thus, in the present study, multiliteracies are

perceived to reflect both teachers' and students' ability to select appropriate technology and use it in a collaborative writing environment.

The affordance of technology also deals with the availability of technological features that facilitate joint-text activities (Parks et al., 2003). Much recent attention has been devoted to studying the affordance of technology in facilitating collaborative learning, and particularly L2 writing. Alshumaimeri (2011) investigated students' writing development after attending a collaborative writing activity mediated by technology. Elola and Oskos's (2010) study on collaborative writing investigated learners' strategies in a collaborative synchronous environment, while Simsek (2009) explored the effect of integrating a weblog into the teaching and learning activities of students' writing. Wong et al. (2011) also studied the use of technology-integrated face-to-face classroom interactions to facilitate the VSPOW (vocabulary, sentence, paragraph, outline, writing) process.

Thus, affordance suggests the integration of technology into language teaching and learning activities. Recent developments in technology, such as portable computers (see Lin & Wu, 2010) and computer application software (see Lamy & Hampel, 2007; Wong et al., 2011), have drawn a big picture of technology affordance applied to the collaborative L2 learning environment, regardless of boundaries of time or place. The next sub-section discusses teachers' and pupils' attitudes to the use of technology in foreign-language learning.

Teachers' and pupils' attitudes to the use of computers in language learning

In language learning, especially at primary and early secondary school levels, computers with Internet access have been used to assist pupils in developing language skills (e.g. Coniam & Wong, 2004; Fidaoui, Bahous, & Bacha, 2010; Mak & Coniam, 2008). Recent studies have found that teachers' and pupils' attitudes influence the success of computer use in language-learning classrooms. For example, a study conducted by Aydin (2012) focused on teachers' perceptions of computer applications in EFL teaching and learning practices in Turkey. The study, which involved 157 EFL teachers, accounted for teachers' prior knowledge and their attitudes to integrating computers to support EFL teaching. It was found that, despite teachers' limited knowledge of computer software, they believed that computers might be used as tools to facilitate the teaching and learning process. In addition, the study showed that teachers felt very confident about using computers in their teaching

activities. This was because they were freed from stress, worry, fear, anxiety or scepticism about incorporating technology into teaching and learning classroom activities.

However, the results of Aydin's (2012) study may have been biased, as studies conducted by Abrami (2001) and Mueller et al. (2008) show that lack of familiarity and low competence in using computers discourage rather than promote a positive attitude to using computers in language teaching and learning practices. Although Albirini's (2006) investigation of teachers' attitudes to using technology in Syrian schools similarly revealed that teachers promoted a positive attitude to its use in teaching, he found that their lack of computer competence seemed to be a barrier, leading to rejection of the use of computer technology in classroom teaching practice. Kessler's (2007) results suggest that teachers' confidence in using technology for teaching activities is established mainly by attending training, as well as seminars or workshops that improve their ability to use computers in the classroom.

Fidaoui et al.'s (2010) study of pupils' attitudes to the use of computer technology in language learning shows that computer-assisted language learning (CALL) was able to motivate 48 Lebanese primary school pupils to learn writing. However, despite their positive attitudes to computer use in the classroom, their writing remained of moderate quality. Ayres's (2002) earlier study also shows that learners' attitudes were likely to be driven by knowledge of how computers might benefit the course they were attending. In other words, learners' motivation to use technology in classroom learning remained high if the technology was seen as being able to meet their needs.

However, some studies (e.g. Al-Fudail & Mellar, 2008; Jung, Kudo, & Choi, 2012) show that technology use in the classroom may cause stress to teachers and students, leading to negative attitudes. Al-Fudail and Mellar (2008), focusing on investigating teachers' stress during technology use in a teaching activity, found that it seemed to be demanding for teachers. Activities such as preparation, handling technological errors, monitoring and controlling activities, and providing information about the procedures for using the software resulted in high levels of stress owing to teachers' ignorance of how to handle technological problems, high work demands and little teaching preparation time. The results suggest a requirement for proper training for teachers and technical support for the technology used for teaching. In the case of Indonesian schools, a survey by Son, Robb,

and Charismiadji (2011) showed that EFL teachers, particularly in elementary schools, possessed insufficient computer skills. The teachers thus identified a need for technology training to improve their computer skills. Furthermore, the teachers felt that technology training allowed them to "gain online experience contextually relevant to their teaching situations" (p. 34). Therefore, with reference to the studies by Al-Fudail and Mellar (2008) and Kesler (2007), the present study arranged technological training sessions for teachers to equip them with computer skills to operate wikis and other online writing resources (see Chapter 4, Section 4.6.3 for details on training for SFL-genre pedagogy and technology integration in L2 writing). Moreover, technical support was provided during classroom interventions to help teachers incorporate technology during collaborative writing activities.

Jung et al. (2012) investigated Japanese students' levels of stress when using technology to learn English. Their results show that the students suffered stress associated with using technology in online interactions, and identify that students' stress in incorporating technology into their learning came from having little knowledge and experience of using such technology. In addition, technical errors, such as being timed out and server errors, were viewed as factors leading to stress, as well as a lack of technical support to help students solve such problems.

Previous studies have suggested that successful learning using computer technology may be achieved by incorporating both teachers' and pupils' positive attitudes to using computer technology in teaching and learning practices. Positive attitudes may be fostered by providing appropriate information on how the technology might benefit the teaching and learning process (Albirini, 2006; Aydin, 2012; Ayres, 2002; Fidaoui et al., 2010), and by providing experience of using computers (Fidaoui et al., 2010; Hattie, 2009; Selim, 2007). Training and other information provided prior to using technology in teaching and learning activities is likely to promote both teachers' and pupils' readiness for technology use (Al-Fudail & Mellar, 2008; Fidaoui et al., 2010; Jung et al., 2012; Levy, 2009).

3.4 Previous studies relating to the use of technology in a collaborative writing activity

The present study investigates e-collaboration in the teaching and learning of writing in secondary schools in Indonesia. It covers three salient issues: 1) the attitudes of both teachers and pupils to technology use in L2 writing; 2) changes in both teachers' and pupils' attitudes after participating in an e-collaboration project; and 3) the contribution of e-

collaboration to pupils' L2 writing compared with non-collaborative CALL and traditional (non-CALL) teaching methodologies.

Several previous studies have examined teachers' and pupils' attitudes to the incorporation of technology into L2 writing. For example, from the teachers' perspective, Aydin's (2012) study focused on teachers' perceptions of computer applications in EFL teaching and learning practices in Turkey, while Albirini's (2006) investigation examined teachers' attitudes to the use of technology in Syrian schools. From the students' perspective, Fidaoui et al. (2010) explored the motivation of 48 Lebanese primary school pupils in learning writing using technology. The findings of these studies seem to show positive attitudes to technology use in L2 teaching and learning activities, driven mainly by teachers' and pupils' familiarity with and appropriate knowledge of computer applications, as well as appropriate competence in operating computers.

However, some studies (e.g. Al-Fudail & Mellar, 2008; Jung et al., 2012) show that technology use in the classroom may cause stress to teachers and students, leading to negative attitudes. As previously mentioned, Al-Fudail and Mellar's (2008) study shows that technology use in teaching and learning seems to place heavy demands on teachers. From the perspective of learners, Jung et al. (2012) identified that students' stress in incorporating technology into their learning came mainly from their lack of knowledge and experience of using the technology.

In the present study, having evaluated previous studies, methodological issues relating to the data collection method to be used to investigate teachers' and pupils' attitudes to technology use in a language-teaching context were considered. The survey method, which has been used by many relevant studies for data collection (e.g. Aydin, 2012; Ayres, 2002; Cahyani & Cahyono, 2012), does not appear able to clarify both teachers' and pupils' attitudes to technology use. It does not explore attitudes in depth, leading to a failure to explain how attitudes are either formed by teachers and pupils themselves or promoted as a result of certain interventions. Therefore, this study proposes to fill this gap by investigating changes in teachers' and pupils' attitudes to using technology for L2 collaborative writing.

With regard to incorporating computer applications into e-collaborative L2 writing activities, many studies (e.g. Mak & Coniam, 2008; Wong et al., 2011; Woo et al., 2011) suggest the use of wikis as e-collaborative tools. Wikis are believed to fulfil the requirements of online collaborative learning environments (see Alexander, 2006; Chao & Lo, 2009; Larusson & Alterman, 2009), promote pupils' positive attitudes (see Wong et al., 2011) and contribute positively to pupils' learning development (see Mak & Coniam, 2008; Woo et al., 2011). However, this study identifies some gaps in previous research on e-collaborative writing activities. First, there is little information from previous studies about how they controlled participants' access to other online writing resources during collaborative writing activities. As online web systems allow pupils to learn out of school hours (Kerawalla & Crook, 2002; Turvey, 2006), there is a greater possibility of intervention from external parties, which may have biased earlier studies. The earlier literature review has provided a clear understanding of the application of scaffolding within a collaborative writing framework (see Cotterall & Cohen, 2003; Kepner, 1991; Olson & Land, 2007). As discussed earlier, collaborative activity using a scaffolding technique in SFL-genre writing instruction may be effective in the learning cycle, such as during the modelling and joint-text construction stages (see Hyland, 2004, 2008). In previous studies applying genre scaffolding through e-collaborative L2 writing (see Woo et al., 2011), teachers employed different learning scaffolding from that offered by the genre framework. In other words, teacher–student and student–student scaffolding practised in collaborative writing activities did not seem to adopt the instructional method specified by the genre framework (e.g. in the modelling stage, teachers introduced students to text types, linguistic forms required to develop the text, and organisation of the text). This condition is confirmed by Macaro, Handlye and Walter's (2012) meta-analysis, reflecting a disconnect between the use of technology for collaboration and writing pedagogy, suggesting a need for further research to explore this issue.

3.5 Potential use of wikis in EFL collaborative writing activity in Indonesian junior secondary school settings

The earlier discussion of studies on wikis as e-collaborative writing tools in EFL classrooms identified some benefits for students' writing development. More importantly, previous studies and Indonesian government policy on education suggest the potential use of wiki

technology to promote e-collaborative writing activities in Indonesian junior secondary school classrooms. Several factors support this argument. First, from a technological affordance perspective, a survey by Sumintono et al. (2012) shows that 95 per cent of public secondary schools already possess technological equipment, such as computer laboratories with PCs connected to the Internet. This indicates that, technologically, Indonesian junior secondary schools are ready for the incorporation of technology into classroom teaching and learning, particularly for the teaching and learning of English writing facilitated by wiki technology.

Second, the application of wikis in EFL classrooms seems to fit with the local English learning syllabus. As discussed in Chapter 2, the local English syllabus adopts an SFL genre-based approach to classroom teaching and learning (see Section 2.3). In terms of the types of text being taught, the syllabus applies the Sydney school's instructional model (see Section 3.1.3) in focusing primarily on students' writing process. For example, Woo et al.'s (2011) evidence suggests that wikis facilitate genre-based writing in primary school teaching and learning activities. Wikis are shown to help students work collaboratively at the joint-text construction stage. This means that all students working in a group are responsible for developing, expanding and revising a document in the wiki workspace. In addition, as previously discussed, findings by Mak and Coniam (2008) and Woo et al. (2011) reveal that wikis support the application of a processual approach to writing. The editing feature in wikis enables students to develop a writing draft, and through wiki features, students are able to add, delete or correct other peers' texts. The tracking system provided by wikis has been shown to promote learning scaffolding that allows students to observe the development process of their writing, and thus may help them identify their strengths and weaknesses. Given that Indonesian junior secondary school students encounter various issues when writing in English (e.g. vocabulary and grammatical issues), incorporating e-collaborative writing with wikis may help them address such issues. As Zamel (1987) argues, the processual writing approach benefits students by providing a writing strategy that allows them to produce a good piece of writing.

Third, from an age perspective, an earlier study on the use of wikis in an EFL writing classroom shows that, as e-collaborative tools, wikis are regarded as appropriate and can be used by elementary and post-elementary school pupils (year 7 or later) to facilitate their

learning to write in English. This indicates that wikis are regarded as easy to use, and that elementary school pupils are considered to be sufficiently technologically competent to use them. Unfortunately, this is not the case in Indonesia, where widespread use of electronic and online learning is confined predominantly to higher education (see e.g. Suracaya, 2011; Soedjatmiko & Taloko, 2003; Warni, 2016). Moreover, the application of wikis to the teaching and learning of writing in English in Indonesian junior secondary schools has failed to gain attention from EFL teachers. These conditions motivate the present study to incorporate and examine wikis as e-collaborative tools into the teaching and learning of writing of EFL in junior secondary schools in Indonesia.

3.6 Summary

This chapter has presented the review of literature and theoretical framework for conducting this present study. Three approaches to writing and the teaching writing have been discussed with focus on the systemic functional linguistics (SFL) and SLF genre pedagogy for classroom practice. The theoretical foundation collaborative learning activity has also been presented along with the discussion of sociocultural theory, sociocultural theory in language learning classrooms and collaborative learning classrooms. The use of computer in collaborative writing has also been discussed in the chapter with the primary focus on wikis as e-collaborative writing tools and factors effecting the use of technology in language learning classrooms. Finally, the chapter has presented previous studies on the use of technology in a collaborative writing activity.

Chapter 4. Methodological framework

This chapter discusses the methodological framework adopted for this study. Section 4.1 presents the study's objectives and lists six research questions. The pragmatic paradigm of the study and the rationale for adopting a convergent design to address the research questions are presented in Sections 4.2 and 4.3 respectively. Section 4.4 describes the research participants, and in Section 4.5 the qualitative and quantitative instruments for the data collection are discussed. The study process and the classroom intervention procedure for collaborative writing using technology in a second language (L2) are detailed in Sections 4.6 and the data analysis is discussed in Section 4.7. Quality assurance techniques and ethical considerations are presented in Sections 4.8 and 4.9 respectively, and Section 4.10 summarises the chapter.

4.1. Research questions and hypotheses

This study was designed to achieve two aims: 1) to identify teachers' and pupils' perceptions of a collaborative writing activity and their use of technology in an L2 collaborative writing activity; and 2) to examine the effects on pupils' writing achievements of technology use in an L2 collaborative writing activity. The following six research questions (RQs) are addressed in the study:

1. What are Indonesian junior secondary school teachers' perceptions of L2 collaborative writing activities?
    a) What are Indonesian junior secondary school teachers' perceptions of collaborative activity before and after the implementation of an L2 collaborative writing activity?
    b) Do Indonesian junior secondary school teachers' perceptions of collaborative activities change following the implementation of an L2 collaborative writing activity?

2. What are Indonesian junior secondary school teachers' perceptions of technology use in L2 collaborative writing?
    a) What are Indonesian junior secondary school teachers' perceptions of technology use in L2 collaborative writing before and after the implementation of an L2 collaborative writing activity enhanced with computer technology?
    b) Do Indonesian junior secondary school teachers' perceptions of technology use in L2 collaborative writing change following the implementation of an L2 collaborative writing activity enhanced with computer technology?
3. What are Indonesian junior secondary school pupils' perceptions of L2 collaborative writing activities?
    a) What are Indonesian junior secondary school pupils' perceptions of collaborative writing before and after the implementation of an L2 collaborative writing activity?
    b) Do Indonesian junior secondary school pupils' perceptions of collaborative writing change following the implementation of an L2 collaborative writing activity?
4. What are Indonesian junior secondary school pupils' perceptions of technology use in L2 collaborative writing?
    a) What are Indonesian junior secondary school pupils' perceptions of technology use in L2 collaborative writing before and after the implementation of an L2 collaborative writing activity enhanced with computer technology?
    b) Do Indonesian junior secondary school pupils' perceptions of technology use in L2 collaborative writing change following the implementation of an L2 collaborative writing activity enhanced with computer technology?
5. Is there any difference between teachers' and pupils' perceptions of L2 collaborative writing and of technology use in L2 collaborative writing?
    a) Do Indonesian junior secondary school teachers' perceptions of collaborative writing differ from pupils' perceptions before and after the implementation of an L2 collaborative writing activity?
    b) Do Indonesian junior secondary school teachers' perceptions of technology use in L2 collaborative writing differ from pupils' perceptions before and after the implementation of an L2 collaborative writing activity enhanced with computer technology?

6. Do two types of technology integration, e-collaborative CALL and e-resources CALL, in an L2 collaborative writing activity affect pupils' writing achievements?
    a) Does the e-collaborative CALL group achieve better than the non-CALL group?
    b) Does the e-resources CALL group achieve better than the non-CALL group?
    c) Does the e-collaborative CALL group achieve better than the e-resources CALL group?

With regard to RQ6, the following research hypotheses were developed.

Null hypotheses (H_0):

H_{01} = There is no significant difference in pupils' writing achievements between the e-collaborative CALL group and the non- CALL group.

H_{02} = There is no significant difference in pupils' writing achievements between the e-collaborative CALL group and the e-resources CALL group.

H_{03} = There is no significant difference in pupils' writing achievements between the e-resources CALL group and the non-CALL group.

Alternative hypotheses (H_a):

H_{a1} = There is a significant difference in pupils' writing achievements between experiment and passive control groups.

H_{a2} = There is a significant difference in pupils' writing achievements between experiment and active control groups.

H_{a3} = There is a significant difference in pupils' writing achievements between active and passive control groups.

4.2. Research paradigm: Pragmatism

The research paradigm adopted in this study is pragmatism. Pragmatism allows the combination of more than one research paradigm, such as positivism and constructivism, and therefore offers an effective means to investigate a variety of complex issues (see Creswell, 2009; Greene, 2008; Teddlie & Tashakkori, 2010, pp. 15-16). In this study, the positivist paradigm (also called quantitative research) enabled hypotheses developed prior to data collection to be tested and, most importantly, provided opportunities to examine

and validate existing theories about technology use in L2 collaborative writing (Johnson & Onwuegbuzie, 2004). The other constructivist paradigm (also known as qualitative research) helped develop a detailed understanding of the implementation of an L2 collaborative writing activity in an Indonesian junior secondary school context. Thus, as proposed Cohen et al. (2011), the combination of quantitative and qualitative research allowed cross-validation of the findings from the quantitative and qualitative data analyses, allowing not only answers to the research questions, but also in-depth explanations of those answers, to be obtained (Creswell, 2009).

4.3. Method of the study

This section will discuss the mixed methods research and experimental design used in this study.

4.3.1. Mixed methods research

In line with the pragmatic research paradigm, this study employed a mixed methods approach with a convergent design. Convergent design (also known as concurrent or parallel design) provides opportunities to "simultaneously collect both quantitative and qualitative data, merge the data, and use the results to understand a research question" (Creswell, 2012, p. 540), and was deemed to be the most suitable way to answer the research questions of this study. More specifically, the qualitative data gathered from pre-, post- and focus group interviews allowed exploration of both teachers' and pupils' perceptions of technology integration in an L2 writing activity, while the quantitative data obtained from writing scores allowed investigation of the effects of such technology integration on pupils' writing achievements. In addition, simultaneous qualitative and quantitative data collection offered practical benefits in terms of the time and cost of the research (Maxwell & Mittapalli, 2010; Teddlie & Tashakkori, 2010), and enabled the data to be triangulated, thus contributing to the validity of the research (Brock-Utne, 1996; Creswell & Plano-Clark, 2011; Maxwell & Mittapalli, 2010).

4.3.2. Quasi-experimental design

A quasi-experimental design was purposefully developed to examine the effects on pupils' writing achievements of two types of technology integration, e-collaborative CALL and e-resources CALL, in an L2 collaborative writing activity (RQ6). A quasi-experimental design was selected for two reasons. First, as an *experimental* design, it enabled the conditions of each research group to be controlled and manipulated in order to determine clearly the effect of a specific teaching approach on pupils' writing achievements (see Cohen et al., 2011). Second, as a *quasi* design, it involved intact classes, which precluded the possibility of full random sampling but was nevertheless important in order to provide teachers and curriculum developers with findings from real classroom situations (Brown & Perry, 1991). Thus, in this study, rather than randomly assigning the participants to experimental and control groups, intact classes were randomly assigned to three treatment conditions: 1) e-collaborative CALL group, 2) e-resources CALL group, and 3) non-CALL group. In contrast to previous studies (e.g. Li, Chu & Ki, 2014; Mak & Coniam, 2008; Wang, 2014; Woo et al., 2011), this study controlled an e-resources CALL variable. In the study, pupils' activities in an e-resources CALL group that made use of learning materials available online was monitored, and their writing achievements before and after the intervention were examined. This is because, as some previous studies have shown, access to e-resources was considered to be a factor that might alone influence pupils' writing performance. For example, a study conducted by Hegelheimer (2006) demonstrated how information and communication technology provided writers of English as a second language (ESL) with numerous online grammar resources and helped them reduce syntactical and lexical errors. Similarly, a study by Yeh, Liou and Li (2007) showed how an online application called TANGO could be used as a writing resource to help students in learning synonyms and collocates.

Given the three treatment conditions, three research groups were developed: an experimental group, an active control group and a passive control group. These groups are explained in detail below.

(1) The *experimental group* comprised pupils in the e-collaborative CALL group. Pupils in this group were engaged in online collaborative writing (or so-called e-collaborative writing) using a wiki. A wiki is "a special website that allows all users to contribute or edit within the site, and a record of all contributions is kept" (Storch, 2011, p. 282). Within this

experimental group, pupils were asked to develop a descriptive paragraph collaboratively in a wiki space (http://www.theindonesianschool.com). Pupils were given a username and password so that they could log on to the website and access the online collaborative writing activity. They were also given access to online resources that enabled them to find web-based writing resources.

(2) The *active control group* comprised pupils in the e-resources CALL group and was set up to control pupils' online activity. Pupils in this group performed a collaborative writing activity in a face-to-face environment, but were given online access that enabled them to search for writing resources available online.

(3) In the *passive control group*, pupils carried out collaborative writing in a face-to-face environment with no access to technology and no access to e-collaborative CALL or e-resources CALL.

Table 4.1 below summarises the three groups set up in this study.

Table 4.1 Differences between the three groups

Conditions/Groups	Experimental group	Active control group	Passive control group
Collaboration in writing	Yes	Yes	Yes
Access to e-collaborative CALL	Yes	No	No
Access to e-resources CALL	Yes	Yes	No

As shown in Table 4.1, all pupils in the three research groups carried out an L2 collaborative writing activity. The main condition that differentiated the three groups was access to technology during the collaborative writing activity. In the experimental group, pupils were allowed to access the e-collaborative CALL and the e-resources CALL technology, while pupils in the active control group were able to access only e-resources CALL. No technology use was allowed in the passive control group.

4.4. The research participants

4.4.1. Sampling technique: Multilevel mixed methods sampling

In accordance with the pragmatic view adopted in this study, the participants were selected using a multilevel mixed methods sampling procedure. According to Onwuegbuzie and Collins (2007, p. 292), multilevel mixed methods sampling allows researchers to employ "two or more sets of samples that are extracted from different levels of the study". Both the

teachers and their pupils were involved in the qualitative part of the study, while only the pupils participated in the quantitative part of the research.

The study adopted two different strategies to target study participants: 1) a purposive sampling technique and 2) a random cluster sampling technique. The purposive sampling strategy was chosen to target relevant participants who shared similar characteristics (Cohen et al., 2011; Onwuegbuzie & Collins, 2007). More specifically, three criteria were applied to guide the selection of schools and participants:

1) The national standard of English teaching content based on SFL-genre pedagogy, as specified by the country's national curriculum.
2) English teacher qualifications requiring, in addition to professional recognition, an ability to translate the SFL pedagogy into classroom practice and to use computer technology in teaching, such as the presentation of teaching materials through PowerPoint, and use of the internet and other online facilities for teaching and learning purposes.
3) A required standard of school facilities, referring to internet access and the availability of a variety of computer-related facilities, such as a computer laboratory, LCD projectors, a sound system and WiFi for internet access (BSNP, 2012).

In addition, a random cluster sampling technique was selected to maintain the representativeness of the sample from the population (Cohen et al., 2011). This technique enabled the random selection of schools that met the above three criteria. The selected schools were then assigned into either experiment, active control or passive control groups.

4.4.2. Participant selection process

Based on the three selection criteria, 326 public junior secondary schools (known in Indonesian as *Sekolah Menengah Pertama Negeri* or *SMPN*) were evaluated, but only 36 met the selection criteria in terms of school curriculum, teachers and facilities and were therefore considered suitable for the study. Out of these 36 schools, six schools were then randomly selected in order to ensure their representativeness of the Indonesian population (Teddlie & Yu, 2007). Then, having obtained a research permit from both the University of York, where the researcher was located, and from the Muhammadiyah University of Prof.

Dr. Hamka, where the researcher was employed, all six schools were contacted and asked to participate in the study. Figure 4.1 below summarises the selection process for the study.

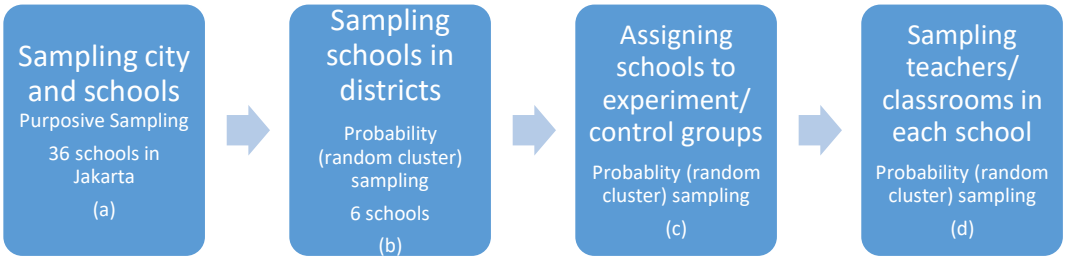


Figure 4.1 Multilevel mixed methods sampling in the study

4.4.3. Study participants

From the six schools, six teachers and 192 pupils were selected, as shown in Table 4.2. These participants participated in the qualitative and quantitative data collection stage. All the teachers were female, aged between 30 and 50, and met the specified English teacher qualification requirement. They all had a minimum of five years' teaching experience and claimed to be computer literate. Five out of six teachers also reported that, in addition to their knowledge of computers, they also used them in their classroom instruction.

Table 4.2 Characteristics of pupil participants at schools

Group	School	Composition		Total	Total in group
		M	F		
Experimental group	School A	13	16	29	65
	School B	16	20	36	
Active control group	School C	17	19	36	66
	School D	13	17	30	
Passive control group	School E	15	17	32	61
	School F	14	15	29	
Total		88	104	192	

Note: School participants anonymised.

The 192 pupils who participated in this study were from Year 7 and were 12 to 13 years old. The decision to choose pupils of this age was based on three factors. First, the focus of this study was on collaborative writing, and pupils of this age, as observed by Cameron (2001) and McKay (2006), are more likely than younger or older pupils to interact actively with each other. Second, according to Coniam and Lee (2008), pupils of this age seem to be able to learn how to use computer technology, such as wikis, much more quickly than pupils of

other ages. The limited previous research on the use of technology by 12 to 13-year-old pupils in an L2 collaborative writing activity in the Indonesian context was the third reason for choosing pupils of this age for this study. All the pupils had learnt English for a minimum of three years, although, according to the teacher participants, their English proficiency was relatively low, especially in writing. The pupils' writing achievements prior to the intervention of this study supported the teachers' claims, suggesting that their knowledge of some writing aspects, such as vocabulary, syntax, cohesion, schematic structure and the communicative purpose of a text, was inadequate and minimal. Only a few were observed to have a good level of knowledge (see Chapter 6 for the findings from the qualitative data).

4.5. Data collection instruments

Three data collection instruments were employed: teacher interviews, focus group interviews, and writing tests. These are discussed in the sections below.

4.5.1. Qualitative data collecting instruments

Teacher interviews

Semi-structured interviews were conducted to explore teachers' perceptions of two types of technology integration, e-collaborative CALL and e-resources CALL, in an L2 collaborative writing activity before and after the intervention. The choice for conducting semi-structure interview with teachers was made as this type of interview offered opportunities for the researchers to carry out the interview in an informal and relaxed atmosphere (Cohen, Manion & Morrison, 2007). Moreover, the choice of semi-structure interview enabled the researcher to prepare prompts to help the researcher "ask respondents to extend, elaborate, add to, provide detail for, clarify or qualify their response (Cohen, Manion & Morrison, 2007, p. 361). The interviews used open-ended questions and were audio-recorded. Open-ended questions were purposefully developed to offer greater opportunities for the teachers to explore their ideas and perceptions (Silverman, 2011).

Despite the benefits offered from utilising semi-structured interviews, some authors (e.g. Cohen et all, 2007, Denscombe, 2007, Drever 1997, Patton, 2002) highlight several weaknesses of the method in collecting qualitative data, particularly concerning subjectivity in interview process, validity and reliability issues. According to Louise Barriball and While

(1994), the semi-structured interview allows the researcher to carry out interviews in flexible settings which thus may affect the use of language to deliver the questions. In other words, interviews in different setting may result in different wording used by interviewers in questioning the participants and this likely affects interviewees' perceptions towards the questions. As Denscombe (2007) argues, interviewees' response towards interview questions is highly dependent on how they perceive the interviewers' questions. This subjectivity in the interviewing process potentially violates the validity and reliability of the interviews.

To address challenges in carrying out semi-structured interviews as mentioned earlier, thus, prior to the interviews, an interview guide was developed to help focus on the objective of the interviews and, importantly, enable the teachers' responses to the questions to be explored in greater depth (see Cohen et all, 2007, Patton, 2002). The interview guide allowed the researcher to maintain the topic of interview questions through employing different wording. As Denzin (1989) argues, validity and reliability particularly do not rely on the use of repeated words during interviews but upon the equivalence of meaning. Such meaning equivalence, according to Louise-Barriball and While (1994), enables the researcher to maintain the standard of the semi-structured interview and to promote comparability of the findings from the interview. Section 4.8.1 will also discuss the quality of qualitative data collection instruments, one of which was the teacher interview.

Six teachers participated in interviews before and after the intervention – two from the experimental group, two from the active control group and two from the passive control group. All the interviews were carried out in a teacher room and were conducted in an informal way. The interviews were carried out after the teachers' teaching sessions had ended, and they were free to have a drink during the interviews, to help them relax and respond freely to the interview questions. In addition, Bahasa Indonesia (the official name of the Indonesian language) was used so that the teachers could express their ideas, thoughts and relevant information "in a more elaborate way" (Emilia, 2005, p. 84). In addition, as Rejeki (2014, p. 72) suggests, use of Bahasa Indonesia during the interviews allowed "the originality of the feeling of participants" to be maintained and information collected more effectively.

Focus group interviews

Focus group interviews with pupils from both the experiment and active control groups were conducted to gather data on their perceptions of the use of technology in L2 collaborative writing before and after the intervention. Since the participants were elementary school pupils, focus group interviews were considered more appropriate than individual interviews. Vaughn, Schumm and Sinagub (1996) believe that children over 6 years of age are appropriate and effective participants for focus group interviews. They argue that children of such ages possess sufficient language to express ideas or thoughts. Moreover, their "incomplete internalisation of socially desirable responses" allow them to provide more spontaneous responses than adult participants (p. 134). Belzile and Oberg (2012) suggest that, through group discussions pupils may better develop their ideas, feel more relaxed and therefore respond to interview questions more openly. More importantly, as suggested by Morgan (1988) as cited in Cohen, Manion & Morrison, 2007, the focus group interview allowed interaction among the interview participants who discuss certain topic and this enabled the researcher to obtain "collective rather than an individual view" about collaboration and the use of technology to facilitate collaborative writing activities.

Several authors (e.g. McLachlan, 2005; Morgan, Gibbs, Maxwell & Britten, 2002) have raised some issues regarding conducting focus group interviews with children, among others: the potential threat of group view on childrens' individual perspective towards the questions and participation issues. According to Morgan et al. (2002), the group serving purposes of focus group interviews may threaten the success of the interview process in that they limit the process of generating the qualitative data. MacLachlan (2005) exemplifies:

> "participants may express emotional or employment problems that are opened up by the group process, or participants may use the process to put-down others or to attempt to recruit others to their viewpoint."

In other words, participants' collective view during a focus group interview may direct other participant's personal view to theirs. Accordingly, the natural generation of the qualitative data may be violated as individual perspective is less sounded and each member of the group does not seem to receive equal opportunity to participate and express his or

her personal view (McLachlan, 2010). The second issue concerns pupils' willingness to participate in a focus group interview. According to MacLachlan (2005), Morgan et all (2002) and Vaughn, Schumm and Sinagub (1996), the success of using focus group interviews is strongly dependent on group member participation in the interview and this may be affected by several factors such as equal opportunity for each member participation, group interaction and classroom setting.

To address the two issues above, during the focus group interview in the present study, pupils were encouraged to speak and respond to the interview questions freely. To stimulate their response towards the interview questions, each pupil was given equal opportunity and time to think before they expressed their viewpoints. Pupils were also informed that they may express different opinions from other peers (see Fargas-Malet, McSherry, Larkin & Robinson, 2010). Additionally, the seating arrangement was designed to encourage their participation and to maintain cohesion of group members (Morgan et all, 2002). In the classroom, chairs were arranged in a circle with pupils sitting at the opposite direction to the researcher. This arrangement, according to Morgan et all (2002), helps the researcher to maintain interaction as well as eye-contact with the pupil participants.

In total, six groups of pupils participated in the focus group interviews. Each interview group involved seven randomly-selected pupils from the experiment, active control or passive control groups. Similarly to the teacher interviews, the focus group interviews were conducted in Bahasa Indonesia to help the pupils express their ideas easily and enable them to ask questions if needed. All the interviews were carried out face-to-face and were video-recorded. Video-recording enabled the researcher to identify who was talking during the interview, and to focus on the talk while at the same time maintaining interaction with the pupils (Wellington, 2000). More importantly, the recordings were also helpful in providing non-verbal information about pupils' perceptions, such as fear or happiness (Creswell, 2012; Wellington, 2000).

Establishing empathy and rapport to participants

The establishment of empathy and rapport is important to enable the participants disclose information to the researchers (Partington, 2011). To this end, as suggested by Partington

(2011), before the study, the researcher visited the schools prior to the start of the study and established contact with the teachers and pupil participants (see also section 4.8.1). Researchers also afforded a good relationship with the teachers and the pupils by having informal talks during the school break time. Second, the researcher piloted the interview questions and examined the interview transcript. This allowed the researcher identify if he employed leading questions and avoided using them in further interviews. Third, the researcher maintained his attitude towards the research participants. Specifically, the researchers maintained their respect as well as sympathy towards participants' views by maintaining non-verbal behaviours such as eye contact and head nods (Fargas-Malet et al, 2010). Besides, as suggested by Cameron (2005) and Fargas-Malet at ell (2010), verbal prompts (such as please, tell me more about …) were utilised to show the pupils that the researcher was listening and interested to know more about the their story.

4.5.2. Writing tests

In addition to teacher interviews and focus group interviews with pupils, writing tests were employed to collect quantitative data on pupils' writing achievements. The use of tests to evaluate pupils' writing achievements has been common in educational quantitative research (Ary, Jacobs & Sorensen, 2010; Brown, 2004) and was therefore employed in this study. A large-scale writing test was developed on the basis of content validity and practicality, taking into account budget, test administration and scoring (Brown, 2004). Below is a description of the text design.

Objective of the writing test

This study employed writing tests to evaluate pupils' ability to develop a descriptive text, which is perceived as a form of language that "presents a specific topic and addresses its attributes" (Piccolo, 1987, p. 839). The purpose of such a text is to describe a particular scene, person, or any other object (see Carrell & Connor, 1991; Derewianka & Jones, 2012; Kumalarini et al., 2008). More specifically, Macken-Horarik (2002, p. 21) suggests that a descriptive text aims to describe "the way things are" by classifying things and then describing their specific characteristics. This genre can be found in pupils' everyday lives, for example in pamphlets, brochures, product details and posters giving specific information

about a topic. According to Macken-Horarik (2002), the schematic structure of a descriptive text includes: (1) a *general statement (classification)* that provides information about the topic or subject being described; (2) *a description of an aspect* or characteristic of the subject; and (3) a *description of activities*, such as behaviour, functions or uses. Typical language features that are used to develop a descriptive text are present tense, technical vocabulary related to the subject being described, verbs that define, characterise, label and describe, and possibly use of the passive voice.

A descriptive text was selected for this study in accordance with the national English curriculum, which states that the main learning objective of English teaching in the first year of junior secondary school is to enable pupils to understand the schematic structure and language features used to describe their social environment (Kemdikbud, 2013). Mastery of a descriptive text in Year 7 is required by the current Indonesian national English curriculum (BSNP, 2006; Kemdikbud, 2013). Pupils are thus expected to learn how to communicate information that they acquire from announcements, invitations, short messages, advertisements and labels on food cans, drinks and other items, and to be able to use the target language in their daily activities (Kemdikbud, 2013).

The descriptive texts were selected by the teachers themselves, as it was deemed that they knew their pupils' interests better and could choose more appropriate topics (Tomlinson, 1998). For example, the teachers might choose a picture of a famous young singer whose songs were familiar to their pupils. The only requirement, in order to maintain some consistency, was the use of texts from three suggested reference books required by the Government.

Design of the writing test

Three writing tests – a pre-writing test, a post-writing test and a delayed post-test – were developed to measure three types of pupils' writing knowledge: grammatical knowledge, textual knowledge and functional knowledge. The language features that were assessed in the pupils' writing task are presented in the writing test design in Table 4.3 below.

Table 4.3 Writing test design

Test Subject	**English**
Level	Junior Secondary School
Year/Term	7/1
Language skill	Writing
Time	60 minutes
Test type	Composition writing
Test format	Paper and pencil-based
Description of test	Pupils asked to develop a descriptive text based on pictures they choose
Outcome	Pupils able to use language features (such as use of article, action verbs and adjectives to describe objects, present tense) in their descriptive text, to describe and use schematic structure (such as general statement, description of aspects or activities), and to understand text functions such as describing things
Genre	Descriptive text
Target of the schematic structure used	General statement, descriptions (of aspects or activities)
Target of language feature used	Present tense, action verbs, relational verbs, article, descriptive adjectives of shape, size, colour and number
Scoring criteria	Grammatical knowledge, textual knowledge and functional knowledge (see Section 4.5.2 for a detailed explanation of the rubric and scoring procedure)

As shown in Table 4.3, grammatical knowledge comprised vocabulary and syntax knowledge: the pupils were expected to show their ability to use appropriate vocabulary and grammatical sentence structures. The textual knowledge involved knowledge of the schematic (generic) structure of a text which, in this study, referred to an understanding of the structure (organisation) of the descriptive text. Finally, functional knowledge evaluated pupils' knowledge of using their writing to achieve a communicative goal or, more specifically to this study, to describe an object.

All the writing tests contained a picture relating to the writing topic, and pupils were asked to write a descriptive paragraph based on that picture. For example, they were asked to describe a picture of "Super Squash" (juice drink) from its colour, shape, taste, etc. (see Appendix 1 for a sample writing test). According to Brown (2004), Knapp and Watkins (2005) and McKay (2006), pictures may help pupils focus on a task and stimulate ideas for their writing. In addition, pictures may elicit information about real-life situations, thus facilitating the generation of ideas in the pupils' writing (Brown, 2004; Heaton, 1976; Weigle, 2002). Equivalent paper-based writing tests were used at all data collection stages, and each lasted for 60 minutes.

Administration of the writing tests

The writing tests were distributed to pupils in all three groups in three sessions: 1) prior to the intervention (pre-test); 2) after the intervention (post-test); and 3) two months after the intervention (delayed post-test). While the use of pre- and post-tests aimed to ascertain the effect of the intervention on writing achievements, the delayed post-test was carried out "to observe possible long-term effects" of the intervention (Simard, 2004, p. 20). All the tests were administered by a classroom teacher in order to ensure that the testing was part of the pupils' English learning activity. Following completion of the writing tests, students' answer papers were sent to independent English teachers for scoring.

Analytic scoring

This study employed analytic scoring to evaluate the pupils' writing. In such scoring, students' writing is rated based on certain aspects or criteria of the writing (Weigle, 2002). This method was chosen for two main reasons. First, it enabled the collection of more detailed information about pupils' performance in different aspects of writing. Second, although analytic scoring seems less practical than its counterpart, holistic scoring, it helped to achieve reliability and objectivity in the resulting scores (East, 2009). While holistic scoring allows teachers to evaluate pupils' work based upon shared criteria (see for example in Chappelle & Douglas, 2006; Hunter, Jones, & Randhawa, 1996), the analytic scoring benefits teachers in that it offer "more detailed diagnostic information about student strengths and weaknesses in various skill areas" (Hunter, Jones, & Randhawa, 1996, p. 63).

In the present study, three aspects of pupils' writing – grammatical, textual and functional – were evaluated. These are summarised in Table 4.4 below.

Table 4.4 Targeted language in pupils' writing

Domain	Definition	Components
Grammatical knowledge		
Vocabulary	Pupils use articles, action verbs and adjectives	Articles "a", "an", and "the"; action verbs; use of adjectives to describe objects.
Syntax	Pupils form sentences correctly	Use of pronouns, present-tense verbs; simple sentences with subject and verb.
Textual knowledge		
Cohesion	Pupils establish connections between sentences	Simple conjunctions, e.g. "and", "but".
Schematic structure	Pupils form text through the organisation of sentences	Schematic structure of the descriptive text.
Functional knowledge		
Communicative purpose	Pupils are able to control ideas	Clearly-developed main describing idea and supporting details.

As shown in Table 4.4, pupils' knowledge of grammar was assessed in terms of their ability to produce articles, verbs, adjectives and pronouns, and to use them appropriately in sentences. Pupils' textual knowledge was examined in terms of their ability to use simple conjunctions and to organise sentences into a descriptive paragraph (or schematic structure). Finally, pupils' functional knowledge was evaluated through their ability to construct a paragraph with a clear main idea and supporting details.

In line with analytic scoring, the study employed a scoring rubric to establish criteria for evaluation of the students' writing. This allowed each writing component to be weighted objectively (Hunter, Jones & Randhawa (1996). Bachman and Palmer's (1996) five-scale scoring rubric, as shown in Table 4.5, was employed to help the test markers understand the pupils' attainment level (Daiker & Grogan, 1991).

Table 4.5 Scoring rubric

Grammatical knowledge aspects

Knowledge of vocabulary			
Scale/Level		**Description**	
0	None	No evidence	Zero, or not relevant
1	Inadequate	Limited knowledge	Small range, vocabulary items frequently used imprecisely
2	Minimal	Moderate knowledge	Vocabulary items frequently used imprecisely
3	Good	Extensive knowledge	Vocabulary items seldom used imprecisely
4	Very good	Complete knowledge	Evidence of complete vocabulary knowledge
Knowledge of syntax			
Scale/Level		**Description**	
0	None	No evidence	Zero, or not relevant
1	Inadequate	Limited knowledge	Small range, a very few structures
2	Minimal	Moderate knowledge	Structure still within a controlled range
3	Good	Extensive knowledge	Few errors in syntax
4	Very good	Complete knowledge	Evidence of complete syntax knowledge

Textual knowledge aspects

Knowledge of cohesion			
Scale/Level		**Description**	
0	None	No evidence	Zero, or not relevant
1	Inadequate	Limited knowledge	Frequently confusing
2	Minimal	Moderate knowledge	Relationship between sentences possibly unclear
3	Good	Extensive knowledge	Highly accurate cohesion
4	Very good	Complete knowledge	Evidence of complete knowledge of cohesion
Knowledge of schematic structure			
Scale/Level		**Description**	
0	None	No evidence	Zero, or not relevant
1	Inadequate	Limited knowledge	Unclear organisation or irrelevant topic
2	Minimal	Moderate knowledge	Generally clear text organisation
3	Good	Extensive knowledge	Wide range of explicit knowledge of text organisation
4	Very good	Complete knowledge	Evidence of complete knowledge of schematic structure
Functional knowledge			
Scale/Level		**Description**	
0	None	No evidence	Zero, or not relevant
1	Inadequate	Limited knowledge	Improperly achieves the communicative purpose
2	Minimal	Moderate knowledge	Generally reflects the communicative purpose
3	Good	Extensive knowledge	Highly accurate communicative purpose
4	Very good	Complete knowledge	Evidence of complete functional knowledge

(Adapted from Bachman & Palmer, 1996, pp. 275-280)

Bachman and Palmer's (1996) five-scale scoring rubric was selected for two reasons. First, as argued by Jonsson and Svingby (2007), a small rating scale offered a greater chance for the markers to achieve agreement regarding pupils' competency. Second, Bachman and Palmer's (1996) scoring rubric provides clear descriptions of the accomplishment, so the test markers would be able to differentiate, for example, between inadequate and minimal attainment, or between good and very good performance, and then make their decisions appropriately.

This next sections will outline the process of this study, first describing the stages of data collection, then explaining the intervention approach, and finally presenting the pilot study. Table 4.6 presents the process of the study.

Table 4.6 Study process

Method of group allocation	Pilot Study	Data Collection 1 (O_1)		Training for teachers	Intervention	Data Collection 2 (O_2)			Data Collection 3 (O_3)		Meta-inference
		Time 1				Time 2			Time 3		
		Qual (1)	Quan (1)			Qual (2)	Analysis 1	Quan (2)	Quan (3)	Analysis 2	
Experimental group		Interview, focus group discussion	Pre-writing test		X_1	Interview, focus group discussion	Perception change	Post-writing test	Delayed post-writing test	Mean difference	
Active control group		Interview, focus group discussion	Pre-writing test		X_2	Interview, focus group discussion	Perception change	Post-writing test	Delayed post-writing test	Mean difference	
Control group		Interview, focus group discussion	Pre-writing test		X_0	Interview, focus group discussion	Perception change	Post-writing test	Delayed post-writing test	Mean difference	

X_1 = collaborative writing activity with access to e-collaborative CALL and e-resources CALL; X_2 = collaborative writing activity with access to e-resources CALL; X_0 = collaborative writing activity with no access to technology.

During the first data collection stage, pre-intervention teacher interviews and focus group interviews with pupils in all three research groups were carried out, and pre-intervention writing tasks were conducted with pupils from the three groups. The intervention was carried out after the first data collection stage. During the second data collection stage, post-intervention teacher interviews and focus groups with pupils in all the research groups were conducted, and post-intervention writing tasks with pupils from all three groups were also performed. Finally, during the third data collection stage, delayed writing tasks were conducted with pupils from all three groups. Meta-inference was undertaken after completion of the third data collection stage.

Rater training

In the present study, two independent English teachers were asked to score pupils' writing at the pre-, post- and delayed post-tests. Prior to the study, these two teachers were given

one day training on how comprehend the scoring criteria in the scoring rubric so that they could "produce reliable, consistent assessment" of pupils' writing (Cumming, Kantor, and Powers, 2002, p. 67 as cited in Harsch & Martin, 2013).

4.6. The intervention approach

4.6.1. Administration of the intervention

The intervention lasted for 80 minutes each week for eight weeks. No participant drop-out was recorded in the study. In administering the intervention to the pupils, Bahasa Indonesia was used by the teachers as the medium of instruction, while at the same time English was used when referring to daily expressions such as greetings, commands and requests, and to technical terms such as grammatical and schematic structure terms. Bahasa Indonesia was also promoted in the classroom due to the pupils' low English proficiency level (Lie, 2007), and it was used together with English to facilitate the pupils' understanding of the linguistic terms (Emilia, 2005).

4.6.2. Instructional model in SFL-genre pedagogy and technology integration

In this study, six teachers from all research groups was asked to carried out an SFL-genre with four stages of instruction (Emilia, 2005; Hyland, 2003, 2009; Paltridge, 2001): 1) Building knowledge, 2) modelling stage, 3) join construction of text, and 4) independent construction of test. These instructional stages were flexible, in that teachers may "enter and re-enter into the cycle" that suits their pupils' need (Hyon, 1996, p. 705). Table 4.7 summarises the SFL-genre pedagogy model.

As shown in Table 4.7, the first stage of building knowledge of the field (BKOF) aims to set the context of a descriptive text (Martin, 2009). In this stage, teachers from all research groups were asked to introduce the pupils to descriptive text and this was done by presenting pictures to the pupils or together with pupils to watch a video, for example, about amusement parks in Jakarta. These activities were performed in order to help pupils develop their knowledge of a descriptive text by making connections between knowledge of a descriptive text and use of such text in real life. In this stage, the intervention across three research groups differed in the extent teachers incorporated technology to facilitate

classroom instruction. While teachers in the two experiment and active control groups were allowed to utilise computer technology to display pictures or play movies related to the descriptive text, none was allowed in the passive control group.

After introducing pupils with descriptive texts, in the modelling stage, teachers introduced pupils to a text, explained its linguistics features and teaches about its organisation. The aim of this modelling stage was to raise pupils' awareness of the structures of a descriptive text and of the social purposes those structures may perform (Callaghan & Rothery, 1988). Similar to the previous stage, only teachers from the experiment and active control groups were allowed to use technology to display images, played movies and presented instructional materials (e.g. linguistic features, sample paragraphs). Moreover, teachers were allowed to use technology to browse webpages or other related resources. Instead, to model a descriptive text, teachers from passive control groups could write the instructional materials, e.g. linguistic features, on the whiteboard or provide their pupils with copied materials.

Table 4.7 SFL-genre pedagogy

<table>
<tr><th rowspan="2">Groups</th><th colspan="4">Instructional model of SFL genre pedagogy</th></tr>
<tr><th>Stage 1: Building Knowledge</th><th>Stage 2: Modelling</th><th>Stage 3: Joint construction</th><th>Stage 4: Independent construction</th></tr>
<tr><td>Experimental (E)</td><td rowspan="2">Teachers presented and led a discussion related to the descriptive text through pictures, films, web pages and related resources (Hyland, 2004).
Questions such as “What is the text about?”, “What purpose does it serve?”, and “Who produces the text?” were used to stimulate pupils’ shared knowledge and experience (Chaisiri, 2010; Hyland, 2004).
Computer technology was used to display pictures or play movies related to the descriptive text.</td><td rowspan="2">Both teachers and students were involved in discussion of (i) the field (or genre of knowledge of the descriptive text, such as its social purpose and text organisation), (ii) tenor (participants in the event) and mode (linguistic features used to construct the text) (Callaghan & Rothery, 1988; Emilia, 2005; Hyland, 2004; Macken-Horarik, 2002).
Computer technology was used to display images, play movies and present instructional materials (e.g. linguistic features, sample paragraphs).</td><td>Pupils were assigned to group work and jointly constructed their own text, with assistance from the teacher (Ahn, 2012; Hyland, 2004; Macken-Horarik, 2002).
The teacher played a role as facilitator and supervised the collaborative writing activity.
Wiki was used to mediate pupils’ collaborative writing
Access to online resources was given to pupils during the L2 collaborative writing.</td><td rowspan="2">Pupils were asked to develop a descriptive text.
Pupils were free to select a topic related to an announcement, invitation, short message, advertisement, or label on a food or drink can.
In developing a descriptive text, pupils’ activity might cover stages such as outlining, drafting and revising (Hyland, 2004, 2009).
During the independent text construction stage, teachers could provide assistance only if the pupils needed it (Hyland, 2003).
The teacher acted as a facilitator.</td></tr>
<tr><td>Active control (AC)</td><td>Similar to the above, but computer technology was used only as a resource (e.g. browsing information from web pages) for collaborative writing. Pupils were not given access to e-collaborative CALL.</td></tr>
<tr><td>Passive control (PC)</td><td>Similar to the above, but no computer technology was used. Teachers selected pictures from brochures, newspapers or magazines.</td><td>Similar to the above, but no computer technology was used. Teachers wrote the instructional materials, e.g. linguistic features, on the whiteboard.</td><td>Similar to the above, but no computer technology was used.</td><td>Similar to above, but no computer technology was used in this stage.</td></tr>
</table>

The third stage, the joint construction stage, is a practice stage in which pupils are invited to demonstrate their achievements with descriptive text in writing (Callaghan & Rothery, 1988). In this study, the pupils were assigned to six small groups, each containing six to eight pupils. In the groups, they were asked to jointly construct their own text. It was assumed that this small-group work would provide greater opportunities for pupils to interact, check their understanding and share their knowledge with each other (Gillies, 2006; Storch, 2002). At this stage, the teacher acted as a facilitator, providing assistance when required (Ahn, 2012; Hyland, 2004).

The teachers used different technologies at this stage. Teachers in the experimental group were asked to use a wiki to facilitate pupils' collaborative writing activities. The teachers and pupils were given usernames and passwords to access a wiki workspace (http://theindonesianschool.com). After logging in, the pupils were asked to develop short descriptive paragraphs about famous people with whom they were already familiar. This was carried out in small groups of six to eight students. In total, six groups were involved in the writing activity in the wiki workspace (see Appendix 7 for some samples). In addition, both teachers and pupils in the experimental groups were given access to online resources to enable them to find web-based writing resources. This included the use of an online dictionary, as well as webpages, such as the British Council's English learning webpages, that provided students with samples of descriptive text.

In the active control groups, the teachers carried out a collaborative writing activity in a face-to-face environment, but both teachers and pupils were given online access to search for writing resources. Prior to the collaborative writing activity, the teachers rearranged the pupils' classroom seating to allow interactions during their work and discussion (Blatchford et al., 2003). The tables were arranged in a rectangular format, and the pupils were asked to sit with their groups. As in the experimental groups, the pupils were asked to develop short descriptive texts about famous people with whom they were already familiar. They were allowed to use technology as a writing resource to help develop their descriptive text.

Teachers in the passive control groups carried out a collaborative writing activity in a face-to-face environment using no technology to facilitate the activities. Similarly to the teachers in the active control groups, the teachers assigned pupils to groups of six, and

rearranged the pupils' classroom seating to facilitate their interaction and collaborative group work.

The independent construction stage is a further practice stage, known as the "individual writing stage" (Callaghan & Rothery, 1988, p. 10). In this study, pupils from all groups were asked to develop a descriptive text individually. Activities such as outlining, drafting and revising, as suggested by Hyland (2004), were carried out to allow pupils to construct a descriptive text. In the experimental and active control groups, technology was used as a learning resource for both teachers and pupils. No technology was used in the passive control groups.

4.6.3. Training for SFL-genre pedagogy and technology integration in L2 writing

Prior to the study, training was given to all six teachers. The aim of the training was twofold: (1) to understand what teachers knew about the SFL teaching pedagogy and how they applied this knowledge to L2 collaborative writing; and (2) to acquaint teachers with essential skills for the integration of technology into writing, such as browsing, creating instructional materials from online resources, and wikis. The training was divided into three sessions. Table 4.8 presents the objectives and descriptions of each training session.

Table 4.8 Teacher training activity

Session	Groups	Objective	Description
1	Experiment, active control, passive control	To provide teachers with information on carrying out a collaborative writing activity in line with the SFL writing pedagogy	Teachers informed about learning cycles in the SFL-genre writing pedagogy, collaboration at the joint construction stage, and their roles in an L2 collaborative writing activity
2	Experiment, active control	To provide teachers with information on the integration of computers into a teaching and learning activity	Teachers informed about the integration of technology into the SFL genre writing pedagogy, and the integration of technology into an L2 collaborative writing activity
3	Experiment, active control	To help teachers use technology in an L2 collaborative writing activity	Teachers practised use of technology in an L2 collaborative writing activity

The training was conducted one month before the study began and it lasted for 60 until 120 minutes. Initially, the training was planned to carry out in a group. However, due to teachers' different teaching schedule, it was done individually. The researcher visited the research sites and trained the teachers at teachers' room or computer laboratory.

Classroom observation was carried out in the present study to see whether the teachers followed the instructions provided in the training. It was done three times in week 2, 4, and 6. An observation check-sheet was developed to help the researcher evaluate teachers' teaching performance and this was presented in appendix 8. The observation check-sheet was also used to see whether the intended treatment was applied (Mertens & McLaguhlin, 2004). In carrying out the classroom observation, the researcher initially contacted the teacher participants in person. He informed them about the purpose of observation, and asked their permission. Teachers were also assured if the observation had no implications on teachers' career at school and the result was confidential. After the teachers agreed to be observed they allocated one to three meetings available for the observation.

The results of the observation check at the first week showed that four teacher participants applied the SFL teaching pedagogy inappropriately. For example, the teachers taught the schematic structure of a descriptive text similarly to the teaching of grammar. Rather than focusing on how a text should be organised to describe things, the teachers required pupils to remember the text organisation. In addition, when integrating technology into one of the classroom activities, three teachers appeared strongly dependent on their technical assistants. The teachers admitted that they lacked technical knowledge and therefore found it difficult to help their pupils to collaborate in the online environment. To address these two issues, two additional training sessions were provided to these teachers. The first additional training focused on helping teachers to understand the type texts, organisation of text and the cycle of SFL writing pedagogy. In the training, teachers were informed about the flexibility of the cycle of which they were not required to complete all the four cycle in one teaching and learning session. The second additional training was aimed to give more time for the teachers to practise the technology for collaborative writing activities. In the training, teachers used their own laptop to learn about how to operate wiki. Teachers were given time to explore menus in wiki web system and tried to write in wiki

space. After the additional training sessions, the second observation check of these teachers revealed that they performed much better and felt more confident about the use of the SFL writing pedagogy and incorporation of e-collaborative CALL and e-resources CALL into classroom writing activities. However, it is important to note that teachers expressed that they still needed technical assistants when incorporating technology in collaborative writing activities.

4.7. Data analysis

4.7.1. Thematic analysis of qualitative data

A thematic analysis approach was employed to analyse the qualitative data collected through teacher interviews and focus group interviews with pupils. Braun and Clarke (2006, p.79) view thematic analysis as "a method for identifying, analysing and reporting patterns (themes) within data". This type of analysis was chosen with reference to the paradigm and design of this study. According to Braun and Clarke (2006, p. 78), thematic analysis is "essentially independent of theory and epistemology", which makes thematic analysis compatible and potentially applicable "across a range of theoretical and epistemological approaches", and particularly for the pragmatic view of research adopted in this study. In addition, thematic analysis was considered appropriate to this study as it aided the identification of patterns of teachers' and pupils' perceptions of EFL collaborative writing activity and use of technology in EFL collaborative writing (Attride-Stirling, 2001). It also facilitated the reporting of "experiences, meanings and the reality of participants" (p. 81). In other words, thematic analysis enabled the researcher to obtain data on meanings, and thus better understand the feelings of teacher and pupil participants after attending the EFL collaborative writing activity, as well as their perceptions of technology use during the activity. Chapter 5 will provide further detail on the procedure for thematic analysis of teacher interviews and pupils' focus group interviews.

4.7.2. Justification for non-parametric tests

Non parametric tests were carried out in this study. Such tests are common in much educational research (e.g. studies conducted by Chen, 2009; Kwang, 2000). The major reasons for performing non-parametric tests in many classroom-based studies are a small sample and the violation of statistical assumptions. In this study, the assumption of normality was violated, as evidenced by statistics from Kologorov-Smirnov and Levene's tests. Assumption testing is explained in detail below.

Data screening

First, data screening was performed to identify missing data and outliers within the three datasets: pre-writing tests, post-tests, and delayed-post writing tests. The data screening was purposefully done to eliminate the possibility of bias in conducting further statistical analysis (Howell, 2008; Lynch, 2003). The results of data screening showed that the number of missing values ranged from 3.7 to 7.9 per cent of the total, with an average of 5.6 per cent. These missing values were due mainly to pupils not attending the writing tests for various reasons, and therefore, following Howell (2008), were regarded as missing completely at random (MCAR). To deal with this issue, MCAR values were excluded from further statistical analysis by performing list-wise deletion, as suggested by some statisticians (Field, 2009; Howell, 2008, 2009; Pickles, 2005).

In addition to the treatment of missing values, outliers were removed from the datasets to avoid biases on the means which might inflate the standard deviation (Field, 2009). This was also carried out to facilitate a normal distribution for the three datasets gathered from the three writing tests. To identify whether particular data were different from the rest, standardised scores (*z*-scores) for each dataset were examined. In this examination, data higher than 3.29 or lower than -3.29 were classified as outliers (see Field, 2009; Pallant, 2010). Only one data point was observed as an outlier. This was considered as a missing value and excluded from further quantitative data analysis.

Examining parametric test assumptions

Two assumptions of parametric tests were examined: 1) assumption of normality and 2) homogeneity of variance. Kolmogorov-Smirnov and Levene's tests were performed to evaluate the normal distribution of the datasets and the homogeneity of variance respectively.

Assumption of normality

Prior to the normality test, the nature of the data was checked to see whether it fulfilled the requirement for the normality test. Field (2009) argues that the data used for parametric assumption should be at the interval level. In this study, the data were regarded as interval data as they had equivalent intervals on the writing score scale (see Field, 2009; Pallant, 2010). A Kologorov-Smirnov test (*D*) was then carried out to examine a normal distribution of the data for the writing tests from all research groups.[2] The pre-test and delayed-post test data from all the research groups were shown not to be normally distributed, $p < 0.05$. In the post-test, only the passive control group data were normal, $p > 0.05$.

Assumption of homogeneity of variance

A Levene's test was performed on the writing test data to examine the homogeneity of variance. The results show that the variances were equal for the pre-writing test, $F(2, 169) = 0.261$, $p = 0.771$, the post-test, $F(2, 169) = 0.573$, $p = 0.565$, and the delayed post-test, $F(2, 169) = 1.644$, $p = 0.196$.

[2] As a comparison, the study also evaluated residuals in order to see whether the distribution of error was normal (see Chen et al., 2003; Cohen et al., 2003; Glass et al., 1972; Howell, 2010; McDonald, 2014; Seltman, 2014). For this evaluation, a Kologorov-Smirnov test (*D*) was also performed. The findings show that the errors were not normally distributed for any of the groups. For the experimental group, the calculation of *D* in the pre-writing test was $D(60) = 0.152$, $p = 0.002$; for the post-writing test, $D(60) = 0.163$, $p = 0.000$; and for the delayed post-writing test, $D(60) = 0.179$, $p = 0.000$. In the active control group, the calculation of *D* in the pre-writing test was $D(59) = 0.147$, $p = 0.003$; in the post-writing test, $D(59) = 0.167$, $p = 0.000$; and in the delayed post-writing test, $D(59) = 0.150$, $p = 0.002$. The result for the passive control group was similar to the other two groups: in the pre-writing test, $D(53) = 0.140$, $p = 0.012$; and in the delayed post-test, $D(53) = 0.126$, $p = 0.035$. Only the post-writing test was shown to be normal: $D(53) = 0.119$, $p = 0.058$. Running a normality test on either the data or the residuals therefore produced similar results.

Non-parametric tests

Non-parametric tests were carried out for statistical analysis due to violation of the parametric assumption of normality. A number of statisticians, including Corder and Foreman (2009), Field (2009) and Zimmerman (1998), suggest that rank-based non-parametric tests, such as the Wilcoxon, Mann-Whitney and Kruskal Wallis tests, successfully address Type I error probabilities, and their use in statistical calculations may be more powerful than their parametric equivalents. Accordingly, to examine differences between the writing tests, the following non-parametric tests were performed.

Table 4.9 Non-parametric tests in line with their conditions

Condition	Experimental design	Non-parametric test
Two conditions (paired test/groups)	Within-subjects	Wilcoxon signed-rank test
	Between-subjects	Mann-Whitney test
Three conditions	Within-subjects	Friedman test
	Between-subjects	Kruskal-Wallis test

The non-parametric tests were undertaken in stages. In the first stage, a Friedman test, which functioned as a one-way repeated ANOVA, was performed to examine pupils' performance in the timed writing tests, including the pre-, post- and delayed post-tests. In the second stage, a Wilcoxon signed-rank test was performed to investigate differences between paired-tests, e.g. pre- and post-tests, and paired groups. A false discovery rate (FDR) was applied to control the Type I error rate, which was inflated by repeated use of a Wilcoxon signed-rank test. Many authors believe that FDR has greater statistical power than other p-value adjustment techniques (Benjamini, 2010; Benjamini & Hochberg, 1995; Verhoeven et al., 2005). Verhoeven et al. (2005), for instance, argue that FDR minimises the chances of Type I errors occurring, and at the same time reduces Type II errors. A Kruskal-Wallis test was carried out to examine differences between the three research groups. Finally, a Mann-Whitney test was performed to investigate differences between paired groups.

4.8. Quality assurance technique

In order to maintain the quality of the research, the quality of the data collection instruments was evaluated. Sub-section 4.8.1 discusses four quality criteria for the

qualitative data collection instruments: credibility, transferability, dependability and confirmability. Sub-section 4.8.2 presents the validity and reliability of the quantitative data collection instruments, and Subsection 4.8.3 explains triangulation in this study. Finally, Sub-section 4.8.4 reports the results of the pilot study.

4.8.1. Quality of qualitative data collection instruments

Lincoln and Guba (1985) suggest four criteria that promote quality in a qualitative study: credibility, transferability, dependability and confirmability. According to Morse et al. (2002), Golafshani (2003) and Shenton (2004), these terms are frequently used in qualitative research to substitute for quantitative researchers' terminology. Thus, credibility is proposed as a substitute for internal validity, transferability for external validity, dependability for reliability, and confirmability for objectivity. In this study, the quality of the qualitative data collection instruments, such as interviews and focus group interviews, was ensured based on these four criteria. More specifically, the following factors were considered to ensure the quality of the qualitative part of the study.

An interview is said to be credible if it facilitates honesty from participants in contributing the qualitative data (Shenton, 2004). To achieve credibility of the interviews, following advice from Shenton (2004) and Cohen, Manion and Morrison (2007), the researcher visited the schools prior to the start of the study and established contact with the teachers and pupil participants. This allowed a rapport to be built with the participants and their acceptance of the researcher's presence in their school community. The participants were also informed that their participation was voluntary and would not affect their careers or progress reports. In addition, an interview guide was developed to help questions to be addressed to the participants during the interviews (Gibson & Brown, 2009). The interview questions were also piloted to check whether the wording used was understood appropriately by the study participants. To avoid wide interpretations of the interview objectives, prompts were compiled to keep the interviews on track (Silverman, 2011). With regard to the validity of the interview data, the interview transcriptions were validated through a member check strategy. As suggested by Merriam (1998), the transcribed data and tentative interpretations of their interview answers were sent back to the teacher participants and they were asked whether they agreed with the transcripts and

the interpretations, or wished to make any changes. No changes were suggested by the participants.

The transferability and dependability criteria in qualitative research concern the generalisability (Patton, 2002; Saldaña, 2011) and reliability of the findings (Shenton, 2004) respectively. According to Seale (2011), in qualitative research, generalisability of findings is not specifically facilitated through random selection of a sample, but rather through a thick (detailed) description of the setting and the process of the research. Seale (2011) argues that such thick descriptions help readers obtain sufficient information about the research, and accordingly they may justify the applicability of its findings to other settings. More importantly, Shenton (2004) argues that a detailed report of the process of the study is beneficial in addressing dependability criteria. Seale's (2011) and Shenton's (2004) procedure was adopted to address both the transferability and the dependability of findings in this study. First, the Indonesian context of the study and the selection process for the participants have been explained. Second, the development of the experiment, active control and passive control groups and types of intervention given to each group have been detailed. Finally, the classroom intervention in the study has been reported in detail.

The other confirmability criterion in qualitative research deals with the objectivity of the research findings. To address this confirmability criterion, as suggested by Seale (2011) and Shenton (2004), this study, and particularly how the research was carried out, was supervised by Dr Irena Kuzborska from the University of York. Triangulation of the qualitative and quantitative data was also performed in order to maintain both the objectivity and the validity of the findings (see Sub-section 4.8.3).

4.8.2. Validity and reliability of quantitative data collection instruments

A body of literature on language assessment (e.g. Bachman & Palmer, 1996; Brown, 2004; Chappelle, 1999; Messick, 1996) addresses the issue of face and content validity in order to maintain the quality of testing instruments. In this study, to maintain the quality of the quantitative data collection instrument, the face and content validity of the writing tests were evaluated, as discussed below.

Face and content validity of the writing tests

According to Brown (2004), face validity deals with the appearance of a test, on the 'face' of it, which provides information to the test takers about what it is designed to test. It was important to ensure face validity in this study because, as argued by Hunter et al. (1996), surface errors and misinterpretation of the test instructions by test takers might have violated the test's validity. Content validity, on the other hand, concerns the representativeness of the subject matter of the test content. This type of validity is achieved by ensuring that the content of the test samples the subject matter in question (Cohen et al., 2007). In this study, to maintain the face and content validity of the writing tests, first an evaluation was carried out to establish whether the test items, test indicators and content of the tests met the learning objectives stated in the learning syllabus, specifically whether the pictures used and the instructions given to the pupils on the test paper would facilitate assessment of their ability to develop a descriptive text, in terms of the function, schematic structure and linguistic features of the text. A professional English teacher was also consulted, who had been certified by the Indonesian government as a professional teacher and a teacher trainer. She also had more than 25 years' teaching experience with several years' experience in developing tests. This teacher was asked to evaluate elements of the writing test, including test performance, test objectives, the instructions used, the colours used for the pictures, the content of the tests and the scoring criteria. These elements are summarised in Table 4.10.

Table 4.10 Face and content validity of the writing test

Elements of test	Description	Appropriateness*					Action taken
		1	2	3	4	5	
Objective	The test is used to examine pupils' descriptive writing				✓		
Instruction	The test provides clear instructions			✓			Some language features, such as use of articles, action verbs, adjectives and present tense, were displayed to clarify what pupils needed to focus on
Time allocation	60-minute allocation for completing the test					✓	
Picture	Representation of a picture as a topic for descriptive writing				✓		The layout of the picture was adjusted
Content of the test	The content of the text matches the English syllabus					✓	
Scoring criteria	The rubric used to evaluate pupils' writing				✓		

*) Scale: 1=not appropriate, 5=highly appropriate

Two main changes based on the teacher's specific comments and feedback were then made to the layout of the picture and the instructions.

Reliability of the writing tests

Reliability is viewed as "a measure of consistency over time" (Cohen et al., 2007, p. 146). This means that, if a test is given to pupils over a particular time period, teachers will obtain similar results. Cohen et al. (2007) advise two alternatives to ensure the reliability of a writing test, namely the test-retest method and inter-rater reliability method. The latter method was selected, and therefore scoring rubrics were adopted. As discussed in Sub-section 4.5.2, the scoring rubric ensured consistency between the test markers in applying the assessment criteria to pupils' writing (Bachman & Palmer, 1996; Brown, 2004). Two independent English teachers were asked to mark pupils' writing based on the rubrics. A Spearman's correlation was performed to determine the relationship between the two raters' scores, using SPSS 21 (Bacha, 2001; Johnson, Penny & Gordon, 2000). Table 4.11 details the Spearman *rho* calculation.

As shown in Table 4.11, a statistically significant correlation was found between the two raters in the pre-tests for all groups (r_s=0.648, 0.898 and 0.906, all ρ = 0.00). Similarly, the post-test scores of rater 1 were significantly correlated with those of rater 2, r_s=0.536,

0.610 and 0.694, all ρ < 0.00. A correlation coefficient of 0.85 suggests a highly reliable instrument, although instruments with modest reliability within the range 0.5 to 0.6 are also considered adequate (Ary et al., 2010).

Table 4.11 Spearman rho scores for the writing tests

Instruments	Group	N	Rater 1		Rater 2		r_s	*P*
			M	*SD*	*M*	*SD*		
Pre-writing test	Experiment	34	10.91	2.92	11.76	2.62	0.643	0.00
	Active control	33	9.15	3.48	10.21	1.93	0.898	0.00
	Passive control	34	9.24	3.21	9.44	2.68	0.906	0.00
Post-writing test & delayed-post test	Experiment	26	9.38	3.75	10.50	2.48	0.536	0.005
	Active control	32	5.81	3.20	9.19	2.34	0.610	0.00
	Passive control	31	7.48	3.73	10.03	2.41	0.694	0.00

4.8.3. Triangulation

In order to maintain the validity of the study results, data triangulation was undertaken. Triangulation is defined as "a combination of methods in the analysis of the same empirical events" (Denzin, 1978, p. 15). Denzin (1978) suggests two types of methodological triangulation: within-method and between-method. This study adopts between-method triangulation, combining both qualitative and quantitative methods to study the effects of technology use on L2 collaborative writing. More specifically, both qualitative teacher interviews and focus group interviews were used to explore teachers' and pupils' perceptions of technology use in L2 collaborative writing. In addition, quantitative data collection methods were used, in the form of writing tests to evaluate students' writing achievements before and after the intervention. The combination of these two strategies provided a better understanding of the different treatment conditions and how they affected pupils' writing achievements.

4.8.4. Pilot study

A pilot study was carried out two months prior to the actual study, in order to diagnose potential problems and make any necessary improvements to the main study design (Teddlie & Tashakkori, 2009). The training session and materials, the intervention and the data collection instruments were piloted at one public secondary school that had similar characteristics to the schools and participants of the main study. The pilot involved three

teachers and 101 pupils. Three groups were set up similar to the study design and were given an intervention.

During the intervention on using technology in a collaborative writing activity, it was identified that the school's facilities were insufficiently reliable to support the pupils' online activity. The WiFi signal was not equally distributed across the school's classrooms, and accordingly teachers and pupils had difficulty accessing the internet. To solve this issue, the teachers were provided with two portable internet routers that allowed them and their pupils to access the internet. These routers were then also used in the main study intervention. In addition, although the teachers had already been trained on how to operate the wiki and to solve potential technical problems, they were still unable to handle several technical issues, such as computer application errors and connection problems encountered by their pupils. To help with these issues, two technical assistants were employed in the classroom.

With regard to the teacher and focus group interviews, it was found to be ineffective to carry out the interviews after school hours. Both teachers and pupils felt tired and did not respond well to the interview questions. Instead, they suggested that the interviews and focus group discussions should occur in school hours or at break times. Thus, in the main study, the interviews with teachers were arranged during their break times, and the group interviews with pupils were conducted during English learning sessions, with the classroom teachers' permission. In addition, during the focus group interview in the pilot study, the pupils were reluctant to disclose much information, perhaps feeling they were talking to a stranger. Accordingly, in order to build some rapport with the pupils, the researcher decided to have an informal discussion with all the pupils prior to the formal focus group interviews. As a result, the students were more open and provided richer answers to the interview questions.

4.9. Ethical considerations

4.9.1. Informed consent

Prior to the study, a detailed consent form was distributed to the teachers and pupil participants (see Appendix 5). With regard to the pupil participants, consent was also sought from their parents. In doing this, the teachers were asked for a list of the pupils participating

in the study, and a letter and consent form were then sent to the pupils' parents through their children, so that the parents could return the consent form to the teacher.

The consent form gave detailed information relating to the study, such as its objectives, the research funder, the researcher, the type of participation, potential risks of participating in the study, how the information from the participants would be gathered and used, confidentiality and anonymity. The consent form also informed the participants of their right to withdraw their consent to participate in the study. Furthermore, at the beginning of the interview, the researcher was reintroduced to both teachers and pupils and the research project summarised again, including the potential benefits that they might gain from participating in the study. The participants' verbal consent was also sought, and their permission requested to record the interviews. In addition, being aware from the pilot study that some pupils were reluctant to voice their opinions on the learning activities, it was again emphasised to the pupils that their information would remain anonymous and secure, and that their participation in the study would have no implications for their scores.

4.9.2. Equality of the intervention

The equality of the intervention refers to "a person's right to service" (Trochim, 2001, cited in Chen, 2009, p. 98). In this study, three research groups were developed: experiment, active control and passive control. The development of a control group as a comparison with an experimental group has been suggested by a number of researchers (e.g. Ary et al., 2010; Chang, Chen & Hsu, 2011). Within the design of this study, the experimental group was given access to e-collaborative tools, and the active control group was able to use computer technology to access e-resources for their collaborative writing activity. However, the passive control group was not granted any access to technology. Under these circumstances, the right of the passive control group to have equal access to language learning supported by technology was denied, and the group was restricted from gaining any benefit from the use of computer technology in the L2 collaborative writing activity. To respond to this equality issue, as advised by Chen (2009), at the end of the study, access to the e-collaborative CALL application was granted to pupils in the active control group, and access to the two types of technology, both e-collaborative CALL and e-resources CALL, was provided to pupils in the passive control group. More specifically, each pupil from

the two control groups was provided with a wiki personal account that provided training materials to all participating schools and teachers. The materials included an electronic book about the SFL pedagogy and lesson plans for classroom instruction.

4.10. Summary

This chapter has discussed the methodological framework employed in this study. A pragmatic view was adopted, informing the choice to integrate two research strands, qualitative and quantitative. This choice guided the development of the data collection instruments, the selection of the study participants and the way the two datasets were analysed. Chapters 5 and 6 will report the findings from the qualitative and quantitative data collection methods respectively.

Chapter 5. Findings from the qualitative data analysis

This study aimed to examine teachers' and pupils' perceptions of technology integration in EFL collaborative writing, and the effect of such integration on pupils' writing achievements. In order to carry out the study, three writing conditions were set up: (1) EFL collaborative writing enhanced by e-collaborative CALL, where teachers had access to e-resources technology; (2) EFL collaborative writing assisted by e-resources CALL; and (3) EFL collaborative writing with no technology support. Three research groups were set up to make interventions for each condition: an experimental group, an active control group and a passive control group. This chapter presents the findings from interviews with teachers and focus group interviews with pupils conducted before and after the intervention for each group. Qualitative data analysis has been carried out to answer the following research questions.

RQ1 What are Indonesian junior secondary school teachers' perceptions of EFL collaborative writing activities?

a) What are Indonesian junior secondary school teachers' perceptions of collaborative activity before and after the implementation of an EFL collaborative writing activity?

b) Do Indonesian junior secondary school teachers' perceptions of collaborative activities change following the implementation of an EFL collaborative writing activity?

RQ2 What are Indonesian junior secondary school teachers' perceptions of technology use in EFL collaborative writing activities?

a) What are Indonesian junior secondary school teachers' perceptions of technology use in EFL collaborative writing before and after the implementation of an EFL collaborative writing activity enhanced with computer technology?

b) Do Indonesian junior secondary school teachers' perceptions of technology use in EFL collaborative writing change following the implementation of an EFL collaborative writing activity enhanced with computer technology?

RQ3 What are Indonesian junior secondary school pupils' perceptions of EFL collaborative writing activities?

a) What are Indonesian junior secondary school pupils' perceptions of collaborative writing before and after the implementation of an EFL collaborative writing activity?

b) Do Indonesian junior secondary school pupils' perceptions of collaborative writing change following the implementation of an EFL collaborative writing activity?

RQ4 What are Indonesian junior secondary school pupils' perceptions of technology use in EFL collaborative writing?

a) What are Indonesian junior secondary school pupils' perceptions of technology use in EFL collaborative writing before and after the implementation of an EFL collaborative writing activity enhanced with computer technology?

b) Do Indonesian junior secondary school pupils' perceptions of technology use in EFL collaborative writing change following the implementation of an EFL collaborative writing activity enhanced with computer technology?

RQ5 Is there any difference between teachers' and pupils' perceptions of EFL collaborative writing and of technology use in EFL collaborative writing?

a) Do Indonesian junior secondary school teachers' perceptions of collaborative writing differ from pupils' perceptions before and after the implementation of an EFL collaborative writing activity?

b) Do Indonesian junior secondary school teachers' perceptions of technology use in EFL collaborative writing differ from pupils' perceptions before and after the implementation of an EFL collaborative writing activity enhanced with computer technology?

In total, 24 interviews were conducted: 12 interviews with teachers and 12 focus group interviews with pupils before and after the intervention. Table 5.1 details the distribution of the interview data for the qualitative analysis.

Table 5.1 Distribution of dataset for qualitative analysis

	Before intervention	After intervention	Total
Experimental group			
Teacher interviews	2	2	4
Pupil focus group interviews	2	2	4
Active control group			
Teacher interviews	2	2	4
Pupil focus group interviews	2	2	4
Passive control group			
Teacher interviews	2	2	4
Pupil focus group interviews	2	2	4
Total	**12**	**12**	**24**

The contributions of the interview data to addressing the research questions (RQ) are presented in Table 5.2.

Table 5.2 Contribution of interview data to research questions (RQ)

Type of data	RQ1	RQ2	RQ3	RQ4
Teacher interview	Teachers from all groups (12 datasets)	Teachers from experiment and active control groups (8 datasets)	None	None
Focus group interview	None	None	Pupils from all groups (12 datasets)	Pupils from experiment and active control groups (8 datasets)
Total	**12**	**8**	**12**	**8**

Interviewees' profiles are summarised for teachers and pupils respectively in Tables 5.3 and 5.4. All interviewees and their schools of origin have been given pseudonyms to protect their identity.

Table 5.3 Teacher groups by name, gender and teaching profile

Group	School	Teacher's name	Gender	Education
Experimental group	School A	Mira	F	Bachelor
	School B	Ratna	F	Master
Active control group	School C	Santi	F	Bachelor
	School D	Dinda	F	Bachelor
Passive control group	School E	Tuti	F	Bachelor
	School F	Warni	F	Bachelor

Table 5.4 Pupil groups by school origin and gender

Group	Focus group interview	School	Pupils' names	Gender
Experimental group	Group A	School A	Rian, Safira, Fadli Nisa, Susan, Rina, Bahri	3 Males, 4 Females
	Group B	School B	Sinta, Ari, Budi, Lina, Marni, Burhan, Maya	3 Males, 4 Females
Active control group	Group C	School C	Andi, Indah, Tiya, Raihan, Raya, Dara, Lusi	3 Males, 4 Females
	Group D	School D	Catur, Bintang, Wulan, Reza, Kristina, Karen	3 Males, 4 Females
Passive control group	Group E	School E	Melly, Rinto, Ahmad, Willy, Ruri, Meta, Wanda	3 Males, 4 Females
	Group F	School F	Rudi, Ambar, Wira, Nani, Yanto, Ridwan, Lela	3 Males, 4 Females

As mentioned earlier in the methodological chapter, the qualitative data were analysed using a thematic analysis. In the study, the thematic analysis of the qualitative data from the interviews involved three stages. In the first stage, all the data obtained from teacher and pupil interviews were transcribed verbatim. The researcher himself did the transcribing to allow familiarisation with the data through reading and re-reading activity (Braun & Clarke, 2006). It is important to note that the data were not translated when analysing the data, but were translated into English for the purpose of providing examples in this thesis. The English translations of these data have been verified by a professional proofreader.

The second stage was the development of codes. Code in qualitative research is viewed as "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2009, p. 3). In the study, abductive coding strategy was employed to allow the researcher to code the interview transcripts both deductively and inductively (Braun & Clarke, 2006; Nurhadi, 2015; Saldaña, 2009). Deductively, codes from the literature review, the interview guides and information collected from the teacher training sessions were

devised prior to the data collection (or also known as pre-structured coding); inductively, codes that "were continuously developed from the interview data" (Nurhadi, 2015, p. 95) also emerged (see also Warni, 2016). The coding process was carried out using qualitative data software called NVIVO. In doing the coding, first, the interview transcripts were imported to the NVIVO application as coding resources and they were classified into two: pre-interview and post-interview document sources. Then, segments of text in the interview scripts were coded and placed under nodes in the NVIVO workspace.

The created nodes and codes in NVIVO application then were themed in the third stage. Saldaña (2009, p. 139) defines theme as "a phrase or sentence that identifies what a unit of data is about and/or what it means". A theme draws common patterns across qualitative data that describe a certain phenomenon. As suggested by many authors (e.g. Nurhadi, 2015; Saldaña, 2009; Warni, 2016), pre-determined themes were developed based on the literature as well as the research questions. However, after reading and re-reading all the qualitative data thoroughly, the pre-determined themes emerged. The interview transcript were then recoded and themed. The result of such second level of coding and theming then were organised in a matrix form "to organise categories, patterns, and themes" (Warni, 2016, p. 138). The matrix of themes of teachers' and pupils' perception of EFL collaborative writing activities and the use of technology in EFL collaborative writing activities are presented in Table 5.5, 5.6, 5.7, and 5.8 respectively:

Table 5.5 Themes of teachers' perception about EFL collaborative writing activity

Main category	**Subcategory**
Teachers' perception of perceived benefits of collaborative activity	Knowledge sharing and cognitive development Affective gains Social benefits
Teachers' perception of task types employed to promote collaborative activities	Language-focused tasks Meaning-focused tasks
Teachers' grouping methods	Grouping strategy Group composition Group size
Issues associated with collaborative activity	Timing issue (emerging theme) Peer feedback issue Insecure learning environment Disruptive behaviour Pupils' preference to work individually

Table 5.6 Themes of teachers' perception about the use of technology in EFL collaborative writing activity

Main category	**Subcategory**
Types of technology used by the teachers in EFL writing classroom	Instructional tools Learning resources (electronic vocabulary, resources from the Internet)
Perceived advantages of technology use in language learning classroom	Instructional materials with multimedia support Creating enjoyable learning environment Promoting motivation Providing model texts for pupils Facilitating homework assignment
Support for technology use in language learning classroom	Technical support Psychological support
Problems encountered by teachers when incorporating technology to facilitate collaborative writing activities	Fewer opportunities to use computer laboratory Poor condition of technology facility Technical issues (Internet connectivity, login issues, web processing)

Table 5.7 Themes of pupils' perception about EFL collaborative writing activity

Main category	**Subcategory**
Pupils' perceived benefits of collaborative activities	Peer learning Learning motivation Promote social skills
Pupils' perception about teachers' grouping method	Mixed-arrangement facilitate learning Concern about teachers' authority Pupils' preference to select their own group members
Strategies for completing group tasks	Division and non-division of tasks
Issues relating to collaborative writing activities	Time mismanagement Interpersonal conflict Disruptive behaviour

Table 5.8 Themes of pupils' perception about the technology use in EFL collaborative writing activity

Main category	**Subcategory**
Pupils' ability and use of technology for learning	Word processing application Presentation tools Online activities
Perceived benefits of technology use in EFL classrooms	Facilitate the learning of English Promote motivation Create an enjoyable learning classroom
Technical issues when using technology in collaborative activities	Computer error Slow Internet connection

In presenting the findings from the teacher interviews and pupil focus groups, labels *Pre-interview* and *Post-interview* are attached to each quotation to specify whether the interview took place before or after the intervention.

5.1 Research question 1: "What are Indonesian junior secondary school teachers' perceptions of EFL collaborative writing activities?"

The first research question explored teachers' perceptions of collaborative writing activities, with a focus on their perceptions before and after an EFL collaborative writing activity, and whether these perceptions changed. In the context of this study, an SFL genre-based pedagogy was adopted to follow the school curriculum. The curriculum requires teachers to incorporate collaborative activity into their teaching, particularly in the teaching of writing, and to promote and monitor pupils' participation and interaction during their group work.

Three broad questions were asked in the pre- and post-interviews to explore teachers' perceptions of collaborative activities before and after the intervention. Six teachers from all research groups attended both interview sessions. The first question aimed to establish what the teachers knew about collaborative activities in EFL primary classrooms; this question also asked about the definition of a collaborative activity and the benefits of conducting collaborative writing in an EFL primary classroom. The second question explored how teachers managed the classroom in order to facilitate collaborative writing, and asked about group formation, collaborative work in relation to stages of learning to write, and teachers' monitoring and provision of feedback. With regard to the second question, teachers were asked to recall lessons in which they had used a collaborative activity and to comment on anything they thought was relevant or important. Finally, the third question explored any issues that teachers had encountered when incorporating collaborative writing activities.

It is important to note here that the term "collaborative activities" was not too familiar to the teachers. Teachers preferred to use the terms "pair work" and "group work" when referring to two or more pupils working together to complete a particular language task, including collaborative work both inside and outside the classroom. The use of such terms indicated that teachers were rather unsure about the actual meaning of the word

"collaboration". In an interview with Tuti, for example, she clarified this issue, as illustrated in the excerpt below:

> "The purpose of pupils working together in a group, … or in a collaborative writing, if I may say, … it means they develop a text or a story together. Is it right?" (Pre-Interview with Tuti).

5.1.1 Perceived benefits of collaborative writing activities

The analysis of the interview data showed that all teachers perceive that collaborative writing activities benefit pupils who are learning to write in English. The teachers mentioned that collaborative work promotes mutual interactions between group members and facilitates pupils' learning of English. More specifically, collaborative work was perceived as having three beneficial effects on pupils' learning in terms of (1) knowledge sharing and cognitive development, (2) affective factors and (3) pupils' social skills.

Knowledge sharing and cognitive development

Most of the teachers interviewed before an intervention viewed collaborative work as an opportunity for pupils to learn from each other and develop their cognitive abilities. According to Tuti, by working with others, pupils could achieve a better understanding of certain issues. She also asserted that "pupils could share what they have already understood from the materials or from teachers' explanation to other peers in the group". This sharing would benefit pupils who seemed to be reluctant to talk to their teachers so that "they could learn better from their peers" (Pre-interview with Tuti). A similar response was also expressed by three other teachers: Santi, Ratna and Dinda. These three teachers affirmed that pupils' interaction with their peers during group work would provide them with opportunities to initiate and negotiate ideas and share them with peers in the group. Drawing on her classroom activities, Santi exemplified how her use of pictures can help promote interaction and group discussion. As she observed, a picture of Dieng Plateau that she gave to the pupils seemed to have encouraged them to share their knowledge about the plateau and accordingly promoted active discussion amongst the pupils in the group.

In terms of writing activity, the analysis of the teachers' interviews suggested that working together in a group provides pupils with the opportunity to learn and share with each other their knowledge of three aspects of writing, namely knowledge of vocabulary,

sentence structure and organisation of text. This writing knowledge, according to the teachers, eventually benefited the pupils during their actual writing stage. Mira and Ratna, for instance, observed that pupils were enthusiastic about working with other peers to identify adjectives from the pictures assigned to them. Ratna believed that pupils' discussion about adjectives helps them "to develop simple sentences that describe certain things" (Pre-interview with Ratna). Besides describing pictures, another teacher, Dinda, stated that her group task of "arranging jumbled words in order" had allowed pupils to share what they had known about text structure. She also observed that pupils made use of their knowledge of text structure to develop their writing; she reported:

> "Once, I asked the pupils to arrange the jumbled sentence in order to make a good paragraph. I observed that there was a discussion among the peers about which sentence should go first, second, etc. I think this activity may have helped pupils to develop their understanding about the text structure and they used this knowledge in their writing." (Pre-interview with Dinda).

In the post-interview, all six teachers from the three groups still believed that knowledge sharing was one of the major benefits of collaborative writing activities. During collaborative work, pupils were allowed to share what they knew about the learning materials with other peers, and especially with those who were low-achieving. As stated by Tuti, "everybody in the group actively shared what they had understood [about the learning materials]". She added, "They really shared their knowledge [about the materials] and this knowledge sharing benefited the pupils with low English ability" (Post-interview with Tuti). Another teacher, Dinda, shared a similar report, as seen below:

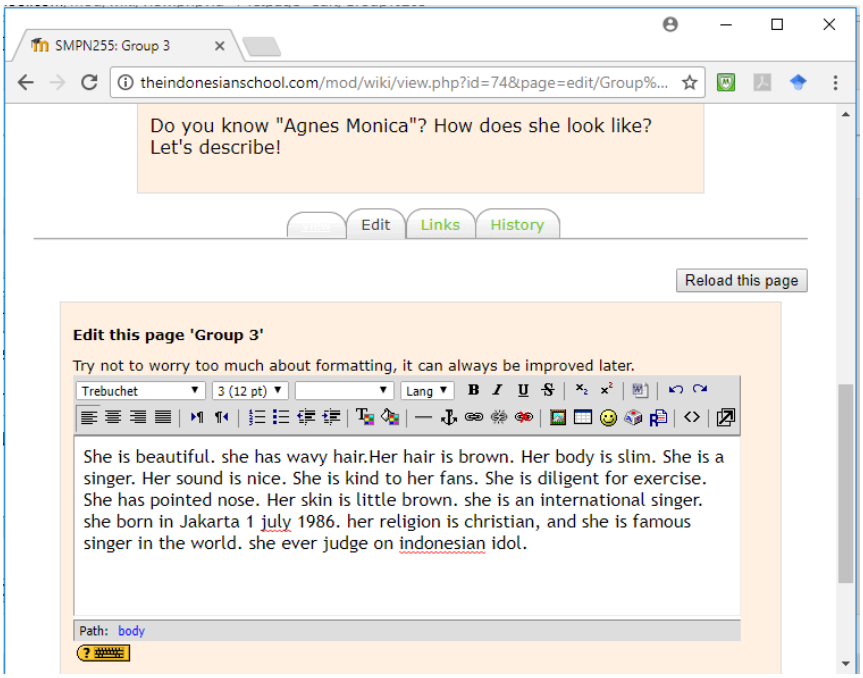
> "They [the pupils] did the task together. Each of them looked at the work of the others. Then, they helped each other, and shared with one another. Pupils also commented on the work of their peers in the group. Others gave an explanation to peers who did not understand the materials" (Post-interview with Dinda).

In terms of writing activity, analysis of teachers' post-interview also showed that working together in a group allowed pupils to share their knowledge of vocabulary, sentence structure and structure of text. Four of the six teachers observed that such knowledge sharing amongst pupils in the group work had eventually helped improve pupils' writing achievement, particularly in writing aspects such as vocabulary, sentence structure and organisation of text. Mira, for example, asserted that, after working together in the group, her pupils now knew more vocabulary, and particularly adjectives. Tuti also observed

that, after partaking in collaborative work, her pupils used more varied vocabulary. She expressed: “the vocabulary [improved]. The vocabulary they used in the writing varied more than before” (Post-interview with Tuti).

In addition to vocabulary, Dinda reported that her pupils had achieved higher levels of sentence structure. She expressed, “I often checked the pupils’ work at home. I noticed that they now could develop a descriptive text with their own words. I also observed [in the wiki space] that they could complete each other’s contribution to the text, and particularly the arrangement of sentence” (see figure below that shows pupils’ editing activity).

Figure 5.1 Sample of pupils editing activity in wiki space



Affective gains

Besides benefiting pupils by offering them opportunities to share their knowledge and develop their cognitive ability, pupils’ interaction in group activities also seemed to help create a comfortable learning environment for the pupils and increases their learning confidence as well as motivation. In the pre-interview, Dinda noticed that some pupils enjoyed learning from others because they were able to express and share ideas freely, as reported:

> "Group work enables pupils to share ideas with each other. Sometime, pupils are reluctant to ask their teachers, and therefore they choose to talk to their peers. If some pupils know the answer to their peers' question, they share it" (Pre-Interview with Dinda).

Data from the pre-interview also suggested that, collaborative work offered pupils more opportunities to interact with peers and provides additional language production opportunities, which in turn increased their confidence in learning and using English. One teacher, Ratna, stated that:

> "By working with other group members, pupils had to always speak in English, which in turn developed their confidence among their peers" (Pre-interview with Ratna).

After the intervention, all teachers still believed that collaborative activities helped to create a comfortable learning environment and increase pupils' motivation to learn. However, there were changes in the teachers' beliefs about the benefits of collaborative work, which seemed to have been caused by the writing approaches that the teachers were asked to implement in the study. More specifically, the teachers from the passive control group emphasised that working with other peers reduces pupils' stress when learning and accordingly promotes learning motivation. One of the teachers in the group, Tuti, stated that pupils seemed to be joyful and happy during most of their learning, particularly when they tried to describe the picture given by the teachers. She added:

> "During the group work, most of the pupils were involved in the group discussion. In my opinion, it was because of the picture that I gave to them. At that time, I gave a picture of policemen. Pupils thought that the picture was funny and laughed at it. Then, they started to work together to describe it" (Post-interview with Tuti).

This finding indicated that, in addition to promoting collaboration among the pupils, the tasks given by the teachers helped to create an enjoyable learning environment for them.

In contrast with the teachers in the passive control group, the teachers from the other two groups, the experimental and active control groups, emphasised the benefits of

technology integration in the EFL collaborative writing activity in terms of pupils be willing to participate. Teachers in the experimental group referred to the wiki as a new but useful and motivating learning resource, both for them and for the pupils. Similarly, the teachers from the active control group observed that pupils showed an interest in the use of multimedia, especially in using animated pictures when working with others; the teachers believed that this use stimulated the pupils' learning motivation. Tuti's comment reflects this belief: "The pupils were really excited, particularly when they tried to describe the picture" (Post-interview with Tuti).

Social benefits

In addition to knowledge sharing, cognitive development, and affective gains, the analysis of teacher pre-interviews showed that collaborative work benefited pupils to the extent that it helps develop their social ability. Four of the six teachers interviewed stated that collaborative work had made it possible for pupils to know each other, interact and work together with other peers who were not in their proximity. These activities, according to the teachers, cultivated pupils' willingness to interact and help each other which, in turn, helped them maintain good social relationships with other group members. More importantly, the activities also seemed to sustain their involvement in a group discussion, as reported below:

> "For group work, I frequently arrange pupils who do not seem to know each other. I believe that through working together, they could build a certain type of relationship. Soon they establish a good relationship, and they will help each other. Pupils could share what they have already understood from the materials or from teachers' explanation, with other peers in the group. It is quite often that they could learn better from their peers than from their teachers. This is, I think, the main objective of group work. They all work together in the group and help each other" (Pre-interview with Tuti).

The analysis of teachers' pre-interview also revealed that collaborative work also helped develop pupils' respect for their peers' opinion. This was illustrated in the pre-interview with Mira, as below:

> "For example, in collaborative writing, I used to give the pupils, ... a task where they had to make a presentation on a topic they had written about. Let's take the topic of 'Internet is useful for us'. Pupils' opinions would be split into agree and disagree. Or, some would feel positive about the Internet, and others might feel negative. But, the thing was that they had to respect their peers' opinion. I think this is one benefit of working together … [it] helps them develop awareness to respect each other (Pre-interview with Mira).

During the post-interview stage, teachers still maintained that pupils' interactions in collaborative work promote social benefits for them. In addition to promoting motivation and encouraging them to help each other and maintain good social relationships with others, the teachers felt that collaborative writing enhances pupils' interpersonal communication ability. Indeed, during the post-interview stage, one of the teachers, Dinda, suggested that pupils had now developed their communicative competence when initiating conversations with others, discussing their ideas during the group discussions, and offering assistance with vocabulary and grammar, as illustrated below:

> "I have observed how the pupils started to give questions to each other, and also how they responded to the questions. They did it well. Like when they worked together on the paragraph, they shared about the vocabulary, and the grammar" (Post-interview with Dinda)

The analysis of teachers post-interview also revealed an interesting fact. While teachers had recognised the social benefits of collaborative activity, the teachers had also introduced a variety of methods to promote pupils' interaction. For example, four teachers proposed a credit element as a component of the group work in an attempt to enhance pupils' active participation in groups. As stated by one teacher, "All the pupils had the attitude score [evaluation of pupils' learning behaviour in classroom] explained to them, so they had no other choice [except to participate actively in the group work]" (Post-interview with Mira).

5.1.2 Types of tasks used to promote collaborative activities

The analysis of teachers' comments in the pre-interview suggested several tasks that teachers employed to promote collaborative activities in the classroom, such as group discussion, group presentation, jigsaw, arranging jumbled sentences into paragraphs, describing pictures, making dialogue. Teachers reported:

> "Then, in the construction-of-text stage, I assigned the pupils group work. I usually gave them, … for example jigsaw" (Pre-interview with Dinda).

> "In Grade 7, I gave the pupils descriptive texts but I jumbled the sentences. I had prepared five texts, sometimes eight. I saw pupils enjoyed it. They worked together on the jumbled sentences" (Pre-interview with Warni).

This is interesting that the collaborative tasks as mentioned above particularly was aimed at twofold: first, it was to help pupils to focus on the meaning from written or pictorial prompts, and second, it was to enable pupils' learning about the language forms required to develop a text. Santi reported:

> "When learning about descriptive text, for example, first I presented to the pupils a picture of Dieng Plateau. This was the [discussion] topic, I showed them the picture to discuss" (Pre-interview with Santi).

Besides picture, collaborative task of "arranging jumbled sentences into paragraph" and a group discussion were employed to allow pupils grasp ideas about the structure of the texts they were learning. This was illustrated in the extracts below:

> "Once, I asked the pupils to arrange the jumbled sentences in order to make a good paragraph. I observed that there was a discussion among the pupils about which sentence should go first, second, etc. I think this activity may have helped pupils to develop their understanding about the text structure and they used this knowledge in their writing" (Pre-interview with Dinda).

> "Before they [pupils] begin to write or to make a presentation, they have to work in a group … to discuss a food recipe they have chosen. They really have to understand the procedure [followed to make the food]. In the group they could discuss the name, and the procedure followed to make it [the food], such as the goals [of the text], the materials needed, … the ingredients. It will help the pupils when writing the text" (Pre-interview with Tuti).

Besides focusing on meaning, teachers employed other tasks, such as group discussion, group presentation, jigsaw, and describing pictures, to enable their pupils to learn about pre-determined forms of language required in the writing process. For example, the teachers gave pupils a picture and asked them to discuss it in groups. In a group discussion, the pupils typically considered the theme of the picture, the characteristics of the object displayed in the image, vocabulary, and how language was used to perform a descriptive function (see section 5.1.1).

The findings above indicated that teachers seemed to have appropriate knowledge about the role of collaborative task not only to promote pupils' interaction in collaborative work, but also to enable pupils to learn about the arrangement of sentences, and language forms required to develop such a text. It is important to note that before assigning pupils the collaborative tasks, teachers frequently had encouraged pupils to work individually, and only later asked them to work in groups. According to the teachers, individual work provided pupils with opportunities to study the picture and to think about linguistic resources (e.g. vocabulary, sentence structure) that allowed them to describe the picture during a group work.

Teachers' perceptions of the types of tasks used to promote collaborative activities remained similar after the intervention. Whilst creating dialogue was not utilised, typical activities employed by teachers included group discussion, jigsaw, arranging jumbled sentences into a paragraph, and describing pictures; teachers used these to promote collaborative activities among the pupils. One of the teachers, Tuti, observed that:

> "During the group work, most of the pupils were involved in the group discussion. In my opinion, it was because of the picture that I gave to them" (Post-interview with Tuti).

The analysis of the post-interview data also showed that teachers still emphasised the knowledge of the text and language forms when talking about the collaborative tasks they assigned to the pupils in the groups. Interestingly, despite the fact that wiki promoted collaborative activity, teachers in the experimental group still persisted with their use of group discussion in the pre-writing stage to promote collaborative work, as illustrated below:

> "I informed the pupils, … that the [group] discussion was not always in the classroom. They could have it outside the classroom" (Post-interview with Mira).
>
> "I asked them to discuss, … about the use of … for example, how to use 'there is …' and 'there are'. I also asked them to write, using this phrase, to describe about their school. For example, 'there is a school yard'" (Post-interview with Mira).

5.1.3 Grouping methods

In addition to task types, grouping methods played an important role in collaborative activities. The analysis of the teachers' interviews showed that grouping strategy, group composition and group size seemed to influence how pupils interacted and worked collaboratively with other group members.

Grouping strategy

Group arrangements were found to be the teachers' major concern when incorporating group work into a writing session. Arranging pupils well in groups was vital for teachers, because this influenced pupils' learning and their motivation to participate in group discussions. Data from the teachers' interviews before and after the intervention showed three strategies that teachers employed to arrange pupils into groups, namely teachers' arrangement, using games, and based upon pupils' proximity. In the earlier method, pupils were arranged into groups by the teachers themselves, as reported below:

> "If I let them [pupils] choose their own group members, it would take a lot of time. It would be time-efficient if the teacher arranged the pupils into groups herself" (Post-interview with Warni).

It was observed that, when grouping the pupils, teachers either assigned groups randomly or by purposefully mixing the groups (usually related to pupils' language proficiency levels, see the subsection Group Composition for further details). While some of the teachers believed that the random arrangement of pupils into groups afforded pupils equal opportunities to be involved in a group, some worried that such an arrangement prevents them from grouping pupils according to their language abilities. To compensate for this, some teachers employed a half-random arrangement, whereby they first chose pupils with higher levels of language proficiency, assigned them the roles of group leaders, and

only then asked them to choose their own groups. This was exemplified by Dinda, who reported that:

> "I first named pupils who I thought had a high language ability. Then, I chose them as group leaders. Then, they could find their own group members. This method made pupils feel free to choose their own partners for the group work" (Pre-interview with Ratna).

Furthermore, teachers mentioned assigning pupils into group work using games, as illustrated in an excerpt from a post-intervention interview with Mira:

> "I employed several strategies to arrange pupils into groups. For example, I used a 'same number' game. I made some cards and numbered them, such as one, two, three etc. Those who had the same number would sit in a group. I also used games. For example, as I already mentioned before, with vegetable, or fruit game" (Post-interview with Mira).

The use of games, according to the teachers, promoted pupils' learning motivation and increased their participation in the group work. This was reflected in a post-interview with Mira: "I grouped the pupils with this method [game]. They [pupils] really loved it and felt it was fair to them".

Besides this, teachers, particularly those from the active and passive control groups, also arranged their pupils based upon their proximity, i.e. seating position. With this strategy, pupils were arranged next to other peers, or were sat behind them. Arranging pupils based upon their seating position was viewed as easy and time-efficient, as reported below:

> "To group the pupils, I paired them according to their seating. It was easy and did not take much time to do this" (Post-interview with Dinda).

When asked if the pupils were happy with her arrangement, Dinda stated that, "So far I observed they [pupils] enjoyed it [working with peers selected by the teachers]. Many of them could interact and communicate with other group members" (Post-interview with Dinda). This finding is interesting, but not surprising, as pupils seemed to have formed a good relationship with the peers sitting next to them for some time before collaborative

activities. More importantly, pupils sitting in proximity to one another would feel a shared level of comfort and would therefore be able to express ideas in English without anxiety.

Group composition

In collaborative activities, the composition of pupils in a group affected how those pupils interact and learn English. Data from the pre- and post-intervention interviews with teachers suggested that a method of mixed language ability was employed when determining group composition. Mixed language ability groups had pupils with higher, medium and lower proficiency levels. It is interesting that the teachers' judgements of pupils' levels of language ability were typically based on their language test scores, vocabulary games prior to the group work or, in some cases, their personal opinions. This was confirmed by one teacher, Ratna, who stated that: "I first named pupils who I thought had a high language ability. Then, I chose them as group leaders" (Pre-interview with Ratna).

The discrepancy of pupils' level of language ability within a group seemed to encourage knowledge sharing and provide learning opportunities among group members; this was particularly so for pupils with a low level of language proficiency. One teacher, Dinda, noted in the pre-interview that she "[I] grouped pupils with mixed ability so that the clever pupils could help the poor ones".

Group size

As discussed earlier, teachers associated collaborative work with group work involving two or more pupils working together to complete a particular language task. They referred to pair work as two pupils sitting next to each other, working on a task together. They applied this type of group work specifically, but not exclusively, to speaking activities. According to the teachers, in a speaking activity, pair work was ideal, because it offered pupils opportunities to practice conversation dialogues with their partners. The teachers also noted that this type of group work, including interactions with peers, was intended to help pupils become more self-confident when speaking English.

In addition, small group work was associated with a minimum of four and a maximum of ten pupils. Groups of four pupils seemed more common because, according to

the teachers, a small group of four was easier to form and manage efficiently. With this said, Dinda expressed that she would have more pupils for group work if her arrangement of four pupils could have run effectively, as illustrated below:

> "At the beginning, I arrange a group of four. When this arrangement works well, later I will assign more pupils to group work" (Pre-interview with Dinda).

In collaborative activities, small group work was arranged when learning speaking, listening or writing. Specifically, with regard to writing, the teachers felt that group work was particularly effective when brainstorming topics for writing, learning vocabulary and constructing texts. Interestingly, one teacher, Santi, claimed that creating work groups of four pupils helped those pupils with grammar when constructing sentences.

A bigger group size of ten pupils was suggested by another teacher, Tuti. She argued that having more pupils in a group might lead to increased levels of interaction amongst the pupils and, accordingly, would promote active group discussion. Moreover, in larger groups, pupils could learn from more peers and this would, in turn, motivated them to learn about writing in English, as reported below:

> "I assigned pupils group work where they were asked to develop a text or story, such as a descriptive text. I arranged the pupils into groups of ten. I gave them pictures of a famous figure and asked them to describe it. You can imagine ten pupils discussing one figure. Each pupil would express what he or she knew about the figure. … I think this man is bla bla … For me this is positive. Pupils could work together with other group members and share their thoughts. They are motivated to be involved in the group discussion because they could learn something from other members" (Pre-interview with Tuti).

5.1.4 Other issues associated with collaborative activities

Despite the benefits of collaborative activities for pupils' learning to write English, several issues were identified by teachers when they discussed collaborative writing in the EFL junior secondary school context; these included timing issues, peer feedback issues, insecure learning environment, disruptive behaviour, and pupils' preference to work individually.

Timing issues

Timing issues was one theme which emerged from teachers' interview data. The data revealed that teachers did not seem to have enough time to carry out all of the collaborative writing activities. For example, Dinda remarked that she was unable to give feedback on the writing submitted by each group during the classroom session. Instead, she discussed with the pupils the common issues apparent in their writing. This is illustrated in two extracts below:

> "I always give feedback on pupils' work. I do it myself at home. I don't give it at school. Like yesterday, no feedback was given. But generally, in the classroom, I explain the pupils common mistakes in their writing" (Post-intervention interview with Dinda).

> "It is quite impossible to give feedback for each piece of writing that pupils have submitted on the day. There is not enough time for it" (Pre-interview with Dinda).

During collaborative writing activities, teachers mentioned that most of the time was spent arranging pupils into groups and conducting the group discussion. Accordingly, teachers felt that they had limited time to carry out collaborative writing. This is based on what Warni reported, as seen below:

> "I always feel that time is too short for group work, particularly for writing. At most, the time is spent only for assigning the pupils into groups and the group discussion. Sometimes, many pupils ask me if they could move into another groups" (Pre-interview with Warni).

Besides this, timing were found to be an issue when integrating technology in collaborative writing. Teachers from the experimental group reported that the use of technology to facilitate collaborative writing required a long period of preparation. One of the teachers, Ratna, stated that "collaborative writing with technology requires careful preparation, such as to prepare computer, log in to the website, … it takes a lot of time" (Post-intervention interview with Ratna). The preparation would be even longer if teachers opted to use a computer laboratory (see Section 5.2.5 for further details).

Peer feedback issues

As discussed earlier, collaborative activity provides pupils with the opportunity to share their knowledge as well as learn from others. It is surprising that pupils seemed to question their peers' knowledge and their English writing ability, whilst also not taking their peers' feedback seriously. This was reported by Santi below:

> "Pupils frequently come to me only to ask if their peers' opinion is right. For example, they may ask about the meaning of certain vocabulary or about simple tense. In terms of the vocabulary, I often encourage them to consult the dictionary because I cannot answer too many questions about it. I don't have much time" (Post-interview with Santi).

The finding above indicated that pupils were likely unwilling to accept their peers' suggestions about the meaning of words and sentence structures. As a result, the pupils resorted to their teachers for help and explanation; the teachers were flooded with numerous questions about the translation of English words.

Insecure learning environment

Teachers' choice to mix pupils with different language abilities was viewed as a factor that creates an insecure learning environment for some pupils. Data from the teachers' interviews suggested that lower-achieving pupils tend to feel inferior and discouraged when working with higher-proficiency pupils. Moreover, one of the teachers, Tuti, found that one lower-achieving pupil was excluded during group activity by the higher-achieving pupils. She reported that:

> "One pupil told me that one of her peers just kept silent without doing anything. Someone had excluded her from group activities. Some pupils decided only to talk with clever peers" (Post-interview with Tuti).

The interviews with the teachers revealed that this feeling of being inferior or being excluded from group activities was a factor that encouraged pupils to behave badly, and in some extent, had been a motivation for pupils to work individually. The negative impact of an insecure learning environment on pupils' disruptive behaviour and pupils' working individually will be discussed further in the following subsections.

Disruptive behaviour

As mentioned earlier, discrepancy of pupils' language ability has resulted on pupils' exclusion of group activities, particularly those who were low-achieved pupils. Such an exclusion often led low-achieved pupils to partake in activities which are were relevant to collaborative tasks, such as playing, running around the classroom, and making jokes. This was illustrated by Warni below:

> "I often find pupils with low-motivated pupils during group work activities. They do not really want to learn. For example, in a group of seven, … I find that one or two of the group members are not serious about learning. These pupils sometimes disturb others" (Post-interview with Warni).

As shown in Warni's comment in the post-interview above, pupils' irrelevant activities apparently had distracted their peers' ability to focus on the collaborative tasks. When pupils lose their focus on learning, they tend to be demotivated in their own learning and most importantly become distracted by others' learning.

Pupils' preference to work individually

Although collaborative activities had enabled pupils to interact and work together on collaborative tasks as found in the study, data from the teachers' interviews revealed that during collaborative activity some pupils were observed to work individually. As discussed earlier, some teachers felt that the insecure learning environment was the reason for pupils' preference to work individually (see previous section). Whilst other teachers, such as Tuti and Dinda, believed that pupils' decision to work individually was related to their personality rather than communication and interaction issues. They reported as below:

> "There are … there are a few pupils who prefer to work individually. But, I know them. It is because of their personality. They prefer to be alone" (Post-interview with Tuti).

> "Maybe around four [pupils who choose to work individually] … but I think that is their learning style, to learn individually. In some cases, they opt to stay away from their group" (Post-interview with Dinda).

Interestingly, Warni observed that pupils who opted to work individually tended to be more serious about their learning when compared to if they learned with other peers during group work. She said, she [pupil] studies more seriously when alone than in a group"

(Post-interview with Warni). Unfortunately, there was no explanation from the interview about why individual work enabled the pupils to work more seriously than when in groups.

5.2 Research questions 2: "What are Indonesian junior secondary school teachers' perceptions of technology use in EFL collaborative writing activities?"

The second research question explored teachers' perceptions of technology in collaborative writing activities before and after the intervention. Two broad questions were asked of four teachers from the experiment and active control groups in the pre- and post-intervention interviews (see Table. 5.2.). The first question aimed to explore teachers' perceptions of technology in EFL teaching and consisted of three sub-questions; these sub-questions pertained to the types of technology that teachers used, the advantages of incorporating technology into classrooms, and the support for technology integration provided by their schools. The second question addressed teachers' use of technology in the classroom, and particularly any constraints that they had encountered when incorporating technology into EFL collaborative writing activities. With regard to the second question, the teachers were asked to recall a lesson in which they had incorporated technology into a collaborative activity, and to comment on anything they believed was relevant or important.

5.2.1. Teachers' ability to operate technology equipment

In both interviews, before and after the intervention, most teachers stated that they had incorporated technology to facilitate teaching and learning English in the classroom; however, teachers' skills in operating the technology still seemed limited. Mira and Santi, for example, mentioned that they possessed basic computer skills, which only allowed them to use a limited number of computer applications, such as Microsoft Word and Microsoft PowerPoint. To help her incorporate technology in the classroom, Mira often acknowledged that she asked for assistance from her colleagues as well as her pupils. For example, as Mira mentioned, she frequently asked her pupils to help her prepare the LCD projector, the screen and the laptop, in the classroom (see Section 5.2.4 for further details on support for technology use in the EFL classroom). Other teachers, namely Ratna and Dinda, claimed that they possessed an intermediate level of computer knowledge, which enabled them to use more multimedia applications with a computer. They also admitted to using social media,

and stated that they had an excellent ability to find teaching and learning resources on Internet webpages, in addition to Microsoft Word and Microsoft PowerPoint.

It is surprising that, although teachers had been given technological training before the intervention, only one teacher, Ratna, felt that she had more knowledge and skill on how to use technology to promote collaborative writing activities. Ratna stated, "I really get knowledge and experience. Now, I know how to use wiki for my pupils' writing activities". However, Ratna stated that she still needed technical assistance from the school to connect to the Internet at the school. This finding indicated that technological training does not seem to make teachers more able to use technology to facilitate collaborative writing activities.

5.2.2. Types of technology used by teachers in EFL writing classroom

The analysis of the teachers' interviews suggested that the choice to incorporate certain types of technology in the classroom teaching was influenced by technological roles: technology as instructional tools and as learning resources. When used as an instructional tool, technology was perceived to help teachers to deliver instructional materials to their pupils in the classroom. This included teachers' use of laptops, LCD projectors, and sound speakers, along with other computer applications such as presentation and multimedia computer applications (for example, an audio player application, audio recorder and video recorder). As teachers mentioned that these types of technology were utilised to facilitate the teaching of all language skills, including speaking, listening, reading and writing.

With regard to writing activity, and particularly collaborative writing, two types of technology were emphasised by teachers: presentation tools, and electronic dictionaries and web browser. Dinda affirmed that "for writing activities, I used technology to present a model of texts. For this purpose, I usually used a laptop and LCD projectors" (Pre-interview with Dinda). The use of a wiki as a collaborative tool was new to the teachers, but seemed to have become a popular tool in their classroom. The two teachers from the experimental group mentioned that they had never utilised a wiki before, but found it easy to use. They also said that the pupils found the wiki easy to use; however, technical issues in incorporating the wiki, such as Internet connection problems, seemed to have influenced teachers' negative perceptions of using it in EFL collaborative writing.

5.2.3. Perceived advantages of technology use in EFL classroom

Data from the teachers' interviews showed that all teachers in the experiment and active control groups felt that they had benefited from using technology in the classroom. In the pre-interviews, all the teachers mentioned that computer technology might help them in the creation of a more conducive learning environment for their pupils. According to the teachers, computer technology could (a) help them prepare instructional materials with multimedia support, (b) create an enjoyable learning environment, (c) promote learning motivation, (d) provide model texts for pupils, and (e) help teachers to assign homework to their pupils.

In terms of writing activities, the use of presentation application (software) such as PowerPoint was popular among the teachers. Teachers mentioned that PowerPoint application allowed them to teach vocabulary with support from multimedia applications, such as pictures and animations. These visual aids, according to the teachers, may help pupils to better understand the meaning of the vocabulary. This was expressed in an excerpt below:

> "Technology helps me in teaching vocabulary. I usually use PowerPoint where I can present the vocabulary accompanied by pictures on slides. The pictures will help pupils understand the meaning of the vocabulary" (Pre-interview with Santi).

In addition, the teachers believed that access to the Internet at school was particularly beneficial, and served as a rich language teaching resource. Through the Internet access, teachers could retrieve samples of different letters with different purposes from websites; these, according to the teachers, could serve as good examples for their pupils.

5.2.4. Support for technology use in EFL classroom

The teachers' use of technology in the classroom was facilitated by their colleagues at school. Usually, these colleagues were IT staff who were knowledgeable when it came to the use of technology. Three out of four teachers from the experiment and active control

groups admitted to receiving frequent support from their colleagues. According to the teachers, some colleagues frequently helped them if there were technical issues when operating a computer application or with the LCD projectors. For example, Dinda received help from her colleague when the LCD projector was not working. Santi was offered the use of her colleague's laptop when hers was not functioning well. Santi reported that she also received a short training session from one of her colleagues, Rian, on how to operate a certain computer application that would help her create instructional materials.

With regards the use of wiki to facilitate collaborative writing activity, teachers mentioned that they received assistance from their colleagues. Mira noted that her colleague, Rudi, helped her upload some learning materials to the wiki system. Mira also added that Rudi helped her pupils to address some technical problems during the collaborative writing activity, including computer errors, problems related to the Internet connection, and wiki loading errors.

In addition to the technical support, the teachers reported that they also received psychological support. Their colleagues encouraged them to implement technology in their classroom and helped them with its implementation if needed. Santi, for example, expressed the following:

> I had a colleague named Rian. He was younger than me, but he knew a lot about technology. He often shared with me his experience of using a computer application for English language teaching. He also asked me to collaborate to create learning materials using a computer application" (Pre-interview with Santi).

5.2.5. Problems encountered by teachers when incorporating technology to facilitate collaborative writing activities

Incorporating technology into classroom teaching did not seem to be an easy task for teachers. Data from the interviews showed that teachers encountered several technological problems, which seemed to have discouraged them from incorporating technology into classroom instruction; these problems included lengthy preparation, fewer opportunities to use computer laboratory, poor condition of technology facility at schools, and Internet connectivity issues.

Lengthy preparation

The amount of time required for preparing technology before classroom instruction had also been a concern for teachers. Teachers argued that they spend a considerable amount of time preparing the technology for classroom teaching. Ratna stated that, "collaborative writing with technology requires careful preparation, such as to prepare computer, log in to the website,… it takes a lot of time" (Post-interview with Ratna). Data from the teachers' interviews also suggested that much of the technology equipment is not available in the classroom, and that some of it may not function properly. Accordingly, teachers were required to take other electronic equipment from the administration office and bring it to the classroom. It was clear that, for some teachers, these activities take up a lot of time. More importantly, these issues had been responsible for teachers not using technology. One of the teachers, Santi, stated that:

> "I myself do not really use technology [in my classroom] because I face many problems when using it. Specifically, the time needed for the preparation is quite long. I have to take and bring the [technology] equipment [from the administration office] to the classroom. Then, I have to set up the equipment for classroom use" (Pre-interview with Santi).

Fewer opportunities to use computer laboratory

Two out of the four teachers from the experiment and active control groups reported that the limited number of computer laboratories available at the school and this offered very few opportunities to use them. There were only one or two computer laboratories per school, and the English teachers had to share them with other subject teachers. The teachers even competed with other colleagues to use them. As explained by Mira, from the experimental group, it was hard to book a computer laboratory for teaching, and her attempts to book a laboratory long before the scheduled teaching were often unsuccessful.

Poor condition of technology facility at schools

The poor condition of some of the technology was another problem that teachers encountered when incorporating technology in their classrooms. Teachers reported that many technology facilities available at the schools did not function very well and many did

not work at all. For example, there were issues with audio-visual materials and LCD projectors, which did not always display clear images or colours. The poor condition of the LCD projectors was a concern for the teachers, as they worried that pupils' vision, particularly of those sitting at the back of the classroom, would suffer. Moreover, the teachers reported that the LCD did not function at all in many of the classrooms, as shown by Mira's comment:

> In the Grade 7 classroom, the LCD projector did not work at all. That was on the second floor; it was due to broken wires. Other LCD projectors (in some classrooms) had no wires to connect to the laptop (Pre-intervention interview with Mira).

Similarly, Santi reported:

> "After setting up the technology in the learning classroom, I found another problem, which was the wires. Sometimes they did not work, so I had to find another replacement" (Pre-interview with Santi).

Such poor technological facilities at the school seemed to be a concern for teachers, and this also seemed to affect teachers' motivation to use technology. This is illustrated by Santi:

> "I used an audio player in the classroom, to help my pupils recognise English sounds. However, the sound system did not work well. The sound was really terrible. This somehow made me not interested in using technology in the classroom" (Pre-interview with Santi)

Internet connectivity

Poor Internet connectivity had also been a problem for teachers and pupils during collaborative writing activity. Three of the four teachers reported that access to the Internet was not equally distributed to classrooms across the school. Dinda, for example, remarked that pupils studying at the school classroom located far from the ICT central room were unable to access the Internet. Moreover, Mira commented on the issue of access to quality Internet, arguing that, "it is difficult to connect to the Internet at a busy hour, such as in the morning" (Pre-Interview with Mira).

The effect of this poor internet connection in collaborative writing activities was significant. All teachers mentioned that they did not use materials and other classroom activities which required internet connection. Dinda for example, stated, "I cannot force

myself to use technology which cannot function properly" (Pre-Interview with Dinda). Dinda also added that she afforded internet connection herself through a private network. Instead, Santi mentioned that she obtained the materials from internet at her house before the classroom session and "made several copies to distribute for her pupils" (Pre-interview with Santi).

Specifically for the experimental groups, teachers mentioned that poor internet connection had affected the collaborative writing activities on the wiki workspace. Mira reported that the loading process into the wiki workspace was quite long. She emphasised by saying, "And again, this is because the internet connection is not really good. Pupils cannot write on the web without a good internet connection" (Post-Interview with Mira). In addition to Mira, Ratna illustrated how poor internet connection affected her pupils' writing activity in wiki space, as below:

> "They have to wait and wait until the web system stores their text in the wiki space and this is very dependent on the internet connection" (Post-interview with Ratna)

The finding above also indicated that, poor internet connection has impacted on pupils waiting time which implied longer time for task completion.

5.3 Research question 3: "What are Indonesian junior secondary school pupils' perceptions of EFL collaborative writing activities?"

The third research question evaluated pupils' perceptions of collaborative writing before and after an intervention and whether their perceptions changed. Pupils in the experiment, active control and passive control groups were asked three broad questions in interviews prior to and after the intervention (details of the pupils can be seen in Table 5.4). The first question aimed to find out what pupils thought about group work in EFL primary classrooms. The pupils were asked three sub-questions about the benefits of working in a group, group arrangements and pupils' choice of partners for group work. The second question explored their strategies for completing a group task, and the third sought to investigate issues that pupils' had encountered when working collectively in a group. With regard to the second and third questions, they were asked to recall a lesson in which they had engaged in a collaborative writing activity.

5.3.1. Pupils' perceived benefits of collaborative activities

Analysis of the pupils' focus group interview showed that collaborative activities offered several benefits for the pupils, such as facilitating peer learning and the promotion of learning motivation. Collaborative activities also helped the pupils to develop their interpersonal skills, such as how to interact, ask a question, or give comments to other pupils. Pupils believed that working together with peers in a group benefits them with the opportunity to learn from each other. Collaborative activities, according to the pupils, provided space for them to question their peers and to discuss specific lessons with others in the group, which facilitates their learning process during group activities. In a group interview, one pupil named Safira explained:

> "In group work, if one pupil did not know about something, other peers would explain it to them" (Pre-interview with Safira, Group A).

Similar responses were also expressed in a group interview with pupils from the active control group before an intervention:

Raya : I like working in a group. Because I can get help from friends
Lusi : Yes, me too. I also can ask question [to friends]

(Pre-Interview with pupils in Group C)

With regards to writing activities, collaborative activities enabled pupils to discuss not only the meaning of certain English vocabulary, but also how such vocabulary was used in a text. This was reported in a group interview:

Rudi : Teachers gave us a picture to describe
Ambar : Yes, right. Then we were asked to observe the picture and write a paragraph
Rudi : Actually, there were already sentences about the picture, but they were incomplete
Wira : We were just to think about the appropriate words [for the sentences]

(Pre-Interview with pupils in Group F)

Moreover, collaborative activities helped pupils correct grammatical errors in their writing:

Andi : Sometimes we discuss about vocabulary.
Lusi : I ever wrote diary and then my friends [in the group] checked the grammar

(Pre-Interview with pupils in Group C)

It is interesting that learning from peer feedback seemed to be a typical way for pupils to acquire knowledge of English vocabulary and grammar; however, they were also critical of its quality. In a group discussion with pupils from the passive control group before an intervention, one of the pupils said:

> "In the group, I always considered peers' comments. If I thought their comments were right, I would accept them" (Pre-Interview with Ambar Group C).

More importantly, though, pupils perceived peers' comments and feedback during collaborative activities as learning resources, which made their learning of English easier. This ultimately increased their motivation and confidence, particularly in learning vocabulary and grammar. This was reported in a group interview with pupils:

Wira : I like to work in group at school
Interviewer : Why is that?
Wira : Because it is easier to do the writing task together with Friends
Lela : Because there will be an assistance from friends
Wira : We can share the task to other friends
Yanto : We can share ideas, too; such as vocabulary

(Pre-Interview with pupils in Group F)

Pupils' perceptions of the perceived benefits of group work did not seem to have changed considerably in the post-interviews. They still perceived that in addition to providing opportunities to learn from each other and to improve learning motivation, working together in a group also promotes social skills. The pupils' social interactions during the group work activity seem to have shaped their ability to work with others and, more importantly, to communicate ideas. These social skills eventually enabled them to establish good relationships with other group members, which created a more conducive learning environment. One pupil, Wulan, said that "It was really fun. I could work together with my friends in the group" (Post-interview with Wulan, Group D). Surprisingly, however, pupils

from the experimental group held that the wiki gave them little opportunity to practise their social skills, claiming it constrained them from meeting each other in person, making it difficult for them to communicate and to discuss issues pertinent to their writing. For example, one pupil, Lina, found that her peer changed the words she wrote in the wiki workspace; unfortunately, she was not given a chance to discuss these changes (Post-Interview with Lina, Group B).

The analysis of pupils' focus group interview showed that collaborative activities offered several benefits for the pupils, such as it facilitated peer learning, promoted learning motivation and helped develop their interpersonal skills such as how to interact, ask for a question or to give comments to others. Pupils felt that working together with peers in a group benefits them with opportunities to learn from each other. Collaborative activities, according to the pupils, provided space for the pupils to ask their peers questions about what they did not know and to discuss particular lessons with others within the group. This accordingly, facilitated pupils' learning process during group activities. In a group interview, Safira expressed:

> "In group work, if one pupil did not know about something, other peers would explain it to them" (Pre-interview with Safira, Group A).

Similar responses were also expressed in a group interview with pupils from the active control group before an intervention, illustrated below:

Raya : I like working in a group. Because I can get help from friends
Lusi : Yes, me too. I also can ask question [to friends]

(Pre-Interview with pupils in Group C)

With regards to writing activities, collaborative activities had enabled pupils to discuss not only about meaning of certain English vocabulary but also how such vocabulary was used in a text. This was reported in a group interview below:

Rudi : Teachers gave us a picture to describe
Ambar : Yes, right. Then we were asked to observe the picture and write a paragraph
Rudi : Actually, there were already sentences about the picture, but they were incomplete
Wira : We were just to think about the appropriate words [for the

sentences]

(Pre-Interview with pupils in Group F)

Besides, collaborative activities helped pupils to correct grammatical errors in the writing, as illustrated below:

Andi : Sometimes we discuss about vocabulary.
Lusi : I ever wrote diary and then my friends [in the group] checked the grammar

(Pre-Interview with pupils in Group C)

It is interesting that learning from peer feedback seemed to be a typical way for pupils to acquire knowledge of English vocabulary and grammar; however, they were critical of its quality. In a group discussion with pupils from the passive control group before an intervention, one of the pupils said:

> "In the group, I always considered peers' comments. If I thought their comments were right, I would accept them" (Pre-interview with Ambar Group C).

More importantly, pupils perceived that peers' comments and feedback during collaborative activities as learning resources which made their learning of English easier. This ultimately increased their motivation and confidence in their learning progress, particularly in vocabulary and grammar. This was reported in a group interview with pupils as below:

Wira : I like to work in group at school
Interviewer : Why is that?
Wira : Because it is easier to do the writing task together with Friends
Lela : Because there will be an assistance from friends
Wira : We can share the task to other friends
Yanto : We can share ideas, too; such as vocabulary

(Pre-Interview with pupils in Group F)

Pupils' perceptions of the perceived benefits of group work did not seem to have much changed in the post-interviews. They still perceived that, in addition to providing

opportunities to learn from each other and improve learning motivation, working together in a group also promotes social skills. The social interactions that pupils had during the group work activity seemed to have shaped their ability to work with other people and, more importantly, their ability to communicate ideas. These social skills eventually enabled them to establish good relationships with other group members, which thus created a more conducive environment for learning. One pupil, Wulan said, "It was really fun. I could work together with my friends in the group" (Post-interview with Wulan, Group D). Surprisingly, however, despite the benefits that pupils from the experimental group had from wiki, wiki was perceived to have given them little opportunity to practise their social skills. The wiki was claimed to constrain pupils from meeting each other in person, making it difficult for them to communicate and discuss things pertinent to their writing. One pupil, Lina, for example, found that her peer changed words that she had written in the wiki workspace, and unfortunately she was not given a chance to discuss these changes (Post-Interview with Lina, Group B).

5.3.2. Mixed group composition and its effect on pupils' group interaction

As presented earlier in subsection 5.1.3, findings from teacher interview revealed that teachers frequently arranged pupils into mixed composition groups which were based upon pupils' language abilities: high-achieving, medium-achieving, and low-achieving pupils. Important to note here is that teachers employed their authority to make such arrangements with little opportunity for pupils to make their own groups. Pupils confirmed the way groups were formed:

Rudi : No, teachers did make the arrangement
Ridwan : Yes, she did it

(Pre-Interview with pupils in Group F)

An analysis of the pupils' group interview showed that pupils perceived this mixed language ability arrangement both positive and negative. Pupils who perceived positive of mixed language ability arrangement mentioned that working with their peers with higher language abilities facilitated their learning to write in English, especially their vocabulary and grammar skills (see also section 5.3.1). Pupils added that their teachers distributed group members equally and fairly, ensuring that each group was equally comprised of pupils with higher, medium, and lower levels of language proficiency. Such equal distribution of pupils

with varied level of language proficiency seemed to have enabled pupils' learning from their peers. This was particularly expressed by one of the pupils, Ambar:

Ambar : Yes, she made the arrangement [mixed language ability] herself because if we chose [our own group members], many chose only the clever pupils to join their groups.

(Pre-Interview with pupils in Group F)

In contrast, those who disagreed with the teachers' arrangements of mixed language ability said that the teachers were unfair in making group arrangements, giving them group partners they did not know well. Such perceptions created an uncomfortable learning environment for the pupils during collaborative activities:

Indah : Somehow, I felt that the teacher forced me to work with peers I did not like. I preferred to choose my own group members.
Tiya : Yes, and I could find clever pupils [laugh]
Interviewer : Why did you want clever pupils?
Tiya : Because, those not clever often asked me to chat about things, or to play around
Dara : They often made noise

(Pre-Interview with pupils in Group C)

Yanto : When teachers assigned me into a group, I often find some pupils who are lazy and always make noise
Tiya : Yes, that is true. I do not like to work with that kind of pupils.

(Pre-Interview with pupils in Group F)

5.3.3. Strategies for completing group tasks

Pupils from the three groups perceived that successful group work was influenced by the strategies they employed to achieve group-work objectives. Data from group interviews with pupils showed that through group interaction, the pupils developed two strategies for task completion, such as division of work and non-division of work. Interestingly, pupils perceived that these strategies helped them to: 1) maintain group members focus on the task so it could be quickly completed, 2) raise awareness that each group member was

responsible to complete the group task, and more importantly, 3) provide pupils with opportunities to experience the process of writing.

In a focus group interview, pupils were shown to employ the division of work strategy to divide the group task into smaller units and distributed the work among the group members. During the paragraph-writing group activity, for example, pupils mentioned that some members of the group would be responsible for drafting a paragraph supported by vocabulary, while others would be responsible for editing the paragraph to eliminate any spelling or grammatical mistakes. When asked about who divided and distributed the group task, pupils mentioned that they led their group leader to do such work division. This was expressed in an excerpt below:

Reza : First we choose the group leader. Then the group leader assign a task unit to each of the group members.
Karen : Yes. Then, we do our own task

(Pre-Interview with pupils in D)

In addition to the division of work strategy, pupils employed a non-division of task strategy where pupils collectively did all group tasks. This choice was made to provide the same opportunities to every group member to experience all stages of the writing process. For example, in the development of a descriptive text, the pupils started the work by discussing the writing topic, then writing the text together (Pre-Interview with Wulan). The pupils also edited the text together before handing it in to the teacher.

Pupils' perceptions of the group activity after the intervention remained like those expressed in the pre- interviews, but the strategies employed by each research group differed. In the active and passive control groups, the pupils employed both division and non-division of work strategies to complete the group task. For example, pupils in the control groups reported:

Ridwan : We shared the group tasks. One pupil is assigned to find certain vocabulary in the dictionary and other peers put it on the text
Karen : I sometime do the correction. For example, if one pupil write one word with wrong spelling, I will correct it

(Pre-Interview with pupils in D)

In contrast, pupils in the experimental group said they completed the group task together without dividing the task into smaller parts. The absence of face-to-face interaction during group work seemed to explain why pupils in the experimental group did not divide the group task. The wiki application had limited the pupils' access to personally meet other group members across the classroom (see Section 5.1.1), which in turn made it difficult to communicate and distribute the group task.

5.3.4. Issues relating to collaborative writing activities

Pupils reported three prominent issues when working together with other peers that prevented them from obtaining effective collaboration: time mismanagement, interpersonal conflict, and disruptive behaviour. Data from the group interview showed that pupils were unable to balance their time between discussing the topic and writing it. Four out of fourteen pupils said that most of their time was spent discussing ideas for the writing task rather than doing the writing. Indah, from the active control group, said, "My friends were questioning the topic very often so that we could not even start to write" (Post-Interview with Indah, Group C)

In addition, the mixed language arrangement applied by the teachers often resulted in interpersonal conflicts. Some pupils with a higher level of language ability seemed reluctant to work with those with lower language abilities because they perceived that those with a low level of language ability lacked sufficient English language skills to do the group task and often detracted from the group activity. As pupils reported in the focus group interviews, playing and joking by some low language ability pupils during the group work activity resulted in the group losing focus on their work and distracted them from the learning process:

Tiya : Because, those not clever often asked me to chat about things, or to play around
Dara : They often made noise and I cannot focus on my work

(Pre-Interview with pupils in Group C)

Besides time management and interpersonal conflict issues, the pupils found that when working collectively in the group, their focus was often distracted by peers' whose

activities were irrelevant to the group task. All pupils from the three groups reported that some peers played and many made jokes during the group work. One pupil in the passive control group also reported, “One of my friends liked to walk around to other groups and bother them with a chat” (Pre-Interview with Wira). These three issues seemed to have made it difficult for pupils to focus on their task, which ultimately prevented them from achieving the group work objectives.

In the post- interviews, pupils from all groups expressed issues with time management, interpersonal conflicts, and disruptive behaviour during the group work. Surprisingly, these three issues were also reported by experimental group pupils, who were given limited access to face-to-face communication. It is important to note here that during the study, four pupils in the experimental group encountered technical problems when working with the wiki and the teacher decided to put them with pupils from other groups to share computers.

5.4 Research question 4: “What are Indonesian junior secondary school pupils’ perceptions of technology use in EFL collaborative writing?”

The fourth research question evaluated pupils’ perceptions of technology use in EFL collaborative writing activities before and after the intervention, and whether their perceptions changed. The pupils from the experiment and passive control groups were asked three focus group questions before and after the intervention. The first explored their perceptions of technology use in EFL learning classrooms, including the types of technology used. The second question addressed the benefits that pupils obtained from using technology in EFL collaborative writing activities, and the third question investigated issues in their use of technology.

5.4.1. Pupils’ ability and use of technology for learning

The findings from the pupils’ group interviews showed that pupils possessed appropriate computer skills. Pupils reported that they were able to operate several technologies. Pupils also mentioned that they utilised technology for learning English in classrooms, including word processing applications, presentation tools, and online applications, such as search engines, translation tools, and webpages. The use of both online and offline versions of

dictionary and translation tools were emphasised by the pupils when learning grammar, reading English texts, and listening and learning about writing in English.

In addition, the use of social media for learning English was popular among the pupils. Pupils in the experimental and active control groups reported that they used social media (such as Facebook) and online discussion forums, particularly to practise their oral and written communication skills. One pupil, Ari, for example said that he participated in Godzilla (an online gaming forum), Kaskus (a well-known Indonesian discussion forum), and other online forums. He found that participating in online forums were beneficial to his English language ability, because it gave him more opportunities to practise his English: he used English to share and discuss certain ideas or topics with other group members in online discussion forums. Due to school policy, pupils' online activities (in social media and discussion forums) were typically accessed from their mobile phones after school hours. This indicated that pupils' ability to operate technology is not only limited to the personal computer, but also includes pupils' competence in using mobile technology. More importantly, the pupils' experiences using social media and with discussion forums indicates their familiarity with online interactions that allow them to share and respond to and discuss ideas with others. Such experiences helped with their use of technologies in collaborative writing activities, such as the wiki. One pupil, Ari, mentioned that he had no difficulties using the wiki because it was like his other online discussions (Post-Interview with Ari, Group B).

5.4.2. Perceived benefits of technology use in EFL classroom

Pupils found that the utility of electronic devices, such as LCD projectors, electronic dictionaries, smartphones, and laptops with Internet access in the English learning classroom facilitated their learning and helped promote affective factors. Regarding writing a text in English, an electronic dictionary quite clearly aids pupils in writing English texts. The data showed that ten out fourteen pupils use tools like Google Translate to find the meaning for vocabulary and phrases in English. Pupils also emphasised that an electronic dictionary helped them to search for the meanings of words quicker than a conventional paper dictionary:

Burhan: It was faster (than finding learning materials manually)
And there were varied resources on the Internet
Marni : Yes faster
Lina : The (writing) format was neat. I could save a lot of my time
because it was faster

(Pre-Interview with pupils in Group B)

All pupils also reported their use of the Internet at school to access resources online. The pupils perceived Google and Wikipedia as online tools that help them to find various models of English texts relevant to their learning:

Catur : I often used Google (to find the materials)
Wulan : I searched (the materials) in Wikipedia

(Pre-Interview with pupils in Group D)

Regarding affective factors, pupils from the experiment and active control groups perceived that the use of technology when learning English in the classroom helped create an enjoyable learning environment and thus motivated them to learn. Further, the pupils found that the use of LCD projectors in classroom activities was attractive and interactive, particularly when teachers displayed big, colourful images and sounds along with text. The audio-visual presentation of text seemed to help pupils grasp its meaning, and allowed all pupils to read it, even those at the back of the classroom. Wulan, a pupil from the active control group said, “The texts were bright so I could see from the back” (Pre-Interview with Wulan).

Pupils also perceived the positives of using an electronic dictionary in the writing classroom. In the post-interviews, most pupils reported that the electronic dictionary in the collaborative writing activity helped improve their ability in vocabulary: “The Alfalink [electronic dictionary device] helped me improve my vocabulary” (Post-Interview with Kristina). Pupils also felt confident about their ability in English. One pupil, Kristina said, “I felt my English was better now” (post-interview).

Regarding the use of the wiki in EFL collaborative writing, pupils in the experimental group found the wiki to be a new web application for them, particularly as a tool for

learning about writing in English. Pupils emphasised the benefits of incorporating the wiki in their collaborative writing activity. In a focus group interview, pupils mentioned that some aspects of their writing, such as spelling, vocabulary, and the grammatical structure of the text, improved after they attended the collaborative writing activity enhanced by the wiki:

Marni : I felt that my knowledge of grammar improved. It was because my friends corrected my sentence
Sinta : [Through wiki] I can correct my own and other peers' writing
Maya : My writing now is better, because my friends correct the grammar
Burhan: I have more vocabularies now

(Post-Interview with pupils in Group B)

Figure 5.2 Pupils' collaborative activity using wiki at School A

Figure 5.3 shows how pupils' writing was developed through several editing (adding text, deleting text, and correcting text) activities.

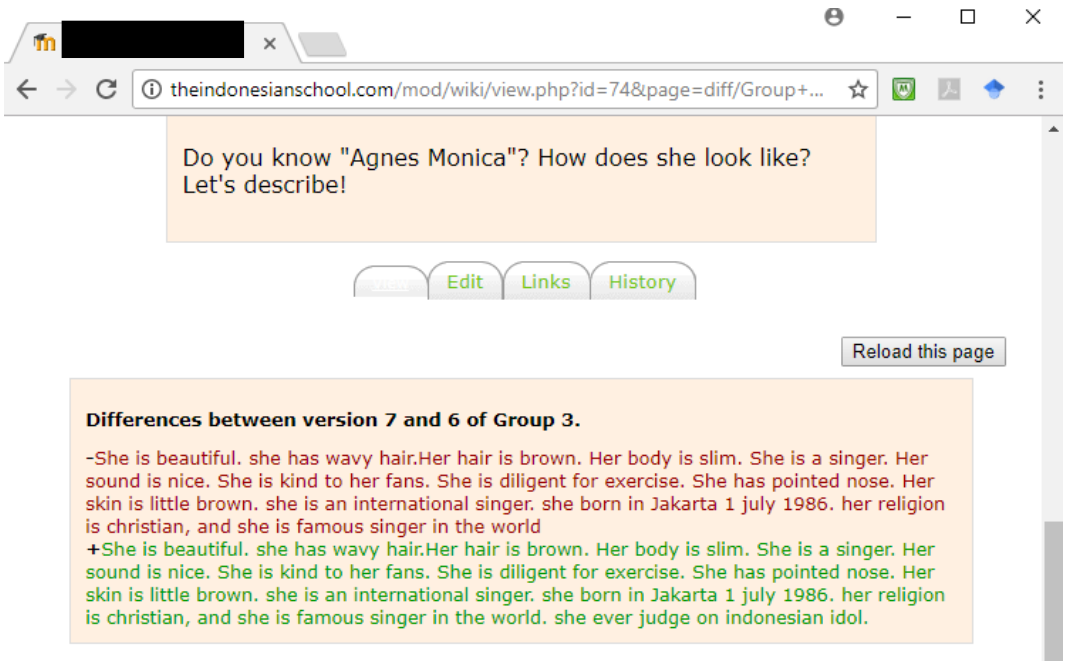


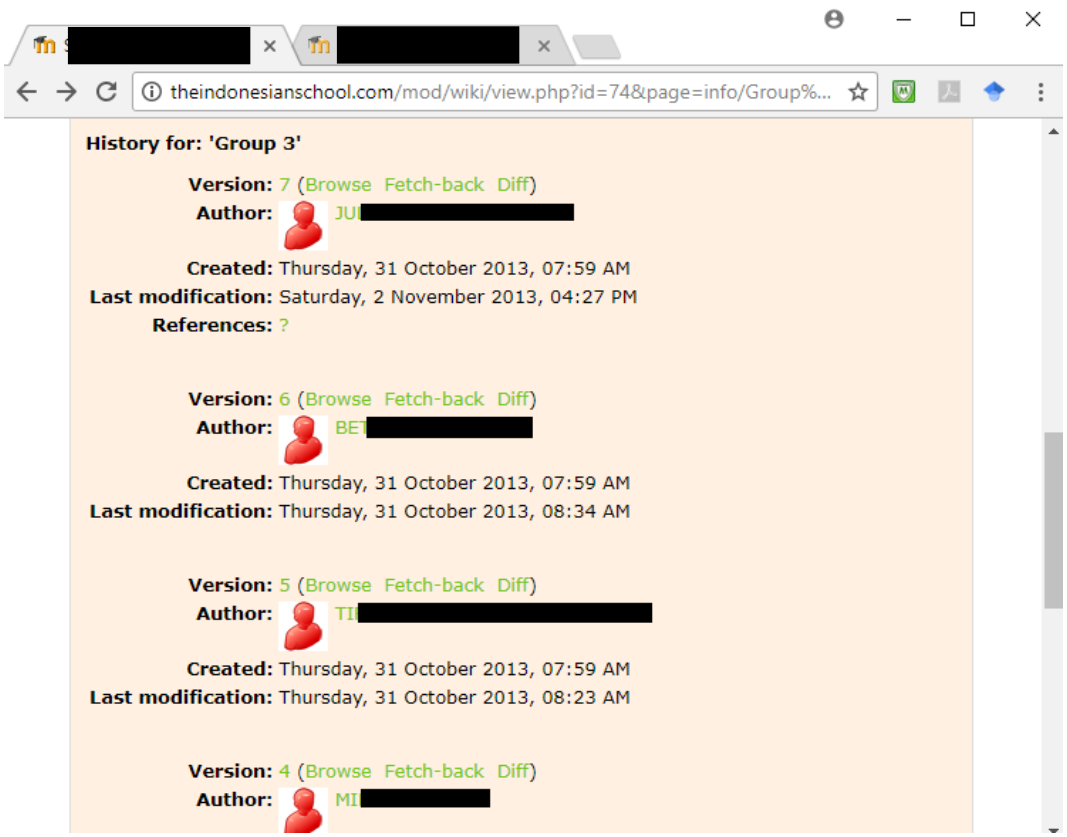
Figure 5.3 Pupils' writing difference before (-) and after (-) editing activities

The following figures illustrate paragraphs constructed by three pupils in the experimental group on the wiki workspace.

Pupil*	**Activity**	**Text**
Sherly	Adding text	she has a golden voice, and she has beautiful face. her skin is white, she has slim body, tall, and long straight hair. and she is a popular singer.
Fenny	Adding text Reconstructing text	she is beautiful. she has wavy hair. *her body is slim*. she is a singer. her sound is nice. she is kind to her fans. she is diligent for exercise. she has pointed nose. her skin is little brown.
Alam	Correcting text Adding text	She is beautiful. she has wavy hair. Her hair is brown. Her body is slim. She is a singer. Her sound is nice. She is kind to her fans. She is diligent for exercise. She has pointed nose. Her skin is little brown. Her skin is white.

*Pupils have been given pseudonyms to protect their identity

Figure 5.4 Samples of pupils' writing activity on the wiki



Note:

Browse: If click, it opens the final version of the text
Fetch-back: If click, it opens an editing space
Diff: If click, it shows pupils the writing version before (-) and after (+) editing activities.

Figure 5.5 List of pupils that contributed to the text development and changes they had made

In addition, the pupils found that the wiki promoted affective aspects. Pupils in the experimental groups said that working together to develop a text using the wiki was fun and enjoyable. This was illustrated in an extract below:

Sinta : I liked (learning to write using) wiki. I could share my ideas to friends
Budi : Yes, I agree
Burhan: Someone corrected my work even I was not able to see him/her
Lina : Yes, [I felt the] same. I added some words to the writing but some of my words were changed [by other group member].

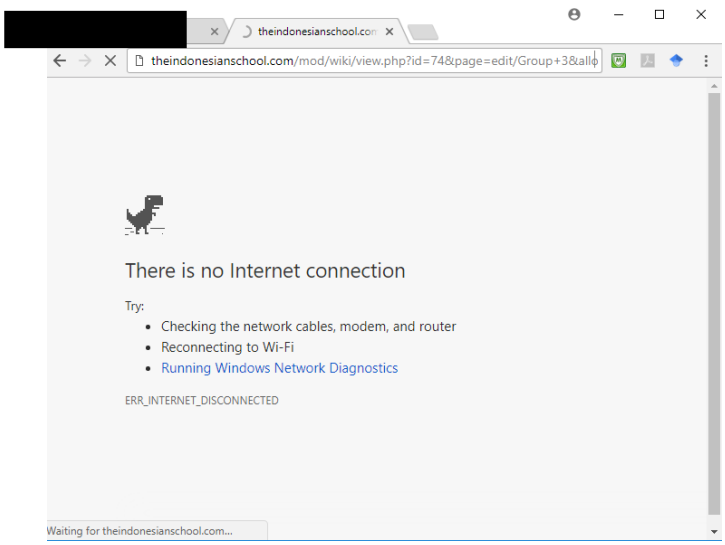
(Post-Interview with pupils in Group B)

This finding indicated that pupils' positive experience of learning writing was due to the opportunities to identify and corrected errors in their group writing activities the wiki provided.

5.4.3. Technical issues when using technology in collaborative activities

Despite the pupils' positive perceptions of technology use in group work, they reported two technical issues when using technology: computer errors and slow Internet connections. For example, a pupil from the active control group found that the computer she was using did not work properly: "The computer was shutting itself down," Wulan reported in the Post-Interview. In addition, the pupils reported that the Internet connection was slow so the wiki took a long time to load.

Figure 5.6 Slow web processing that frequently caused page errors



Furthermore, the slow connection resulted in a lengthy process to input text into the wiki workspace. For example, one of the pupils expressed, "[the Internet speed was] really

slow. It affected my writing activity [in wiki] that I had to wait so long" (Post-Interview with Marni). In responding to these situations, one pupil, Rina, decided to join another group with a reliable Internet connection, while another, Fadli, opted to shut down the computer and leave it. Surprisingly, the school administration made little effort to address this issue. While the pupils believed that the school did little to help them address technical problems, they frequently sought help from their peers to solve computer errors, or consulted family members after school and tried to fix the problems.

5.5 Research question 5: "Is there any difference between teachers' and pupils' perceptions of EFL collaborative writing and of technology use in EFL collaborative writing?"

The fifth research question focused on comparing teachers' and pupils' perceptions of collaborative writing and the use of technology in EFL collaborative writing. To answer this question, teachers' and pupils' perceptions were compared before and after the intervention. Table 5.9 presents summarises these perceptions.

Table 5.9 Teachers' and pupils' perceptions of EFL collaborative writing

Themes	Before Intervention		After intervention	
	Teachers	Pupils	Teachers	Pupils
Perceived benefits				
Knowledge sharing	✓	✓	✓	✓
Promoting social skills	✓	✓	✓	✓
Promoting affective factors	✓	✓	✓	✓
Group arrangement and its effect on pupils' learning	✓	✓	✓	✓
Issues in collaborative writing				
Timing issues	✓	✓	✓	✓
Peer feedback	-	✓	✓	✓
Insecure learning environment	✓	-	✓	✓
Disruptive behaviour	-	✓	✓	✓
Preference to work individually	✓	-	✓	-

As shown in the above Table 5.9, both teachers and pupils had similar perceptions that collaborative activities offered three benefits to the pupils such as they facilitated knowledge sharing, promoted social skills, and helped create an enjoyable learning environment. Both teachers and pupils felt that collaborative writing allows pupils to learn from peers through group discussion and peer feedback. With regard to writing, more specifically, they believed that pupils can learn about spelling and vocabulary, as well as

sentence and paragraph development. Teachers and pupils also held similar perceptions of how groups are formed. They highlighted two types of arrangement: random and mixed group arrangements. Although both teachers and pupils were positive about mixing pupils according to their language level, some pupils reported that they were unable to work with peers that they did not know well.

Comparison of teachers' and pupils' perceptions of EFL collaborative writing enhanced by technology is summarised in Table 5.10. This comparison includes only two research groups, the experiment and active control groups.

Table 5.10 Issues regarding EFL collaborative writing enhanced by technology shared by teachers and pupils

Themes	**Before Intervention**		**After intervention**	
	Teachers	**Pupils**	**Teachers**	**Pupils**
Ability and use of technology to support teaching and learning	✓	✓	✓	✓
Benefits of technology integration in EFL collaborative writing	✓	✓	✓	✓
Technical issues when using technology	✓	✓	✓	✓
Technical support	✓	-	✓	-

As shown in Table 5.10, both teachers and pupils from the two groups claimed to possess ability to operate technology and use it to support their teaching and learning of English. Although, their level of technological ability differed. In addition, teachers and pupils also identified similar benefits from the integration of technology into collaborative writing. These were (a) teaching and learning materials with audio-visual support, (b) enjoyable teaching and learning environment, and (c) teaching and learning resources. With regard to the use of the wiki, both teachers and pupils in the experimental group felt positive about the collaborative writing activity enhanced by the wiki. The wiki was perceived easy to use, and incorporating it into collaborative writing helped teachers create a conducive learning environment for their pupils. The wiki was also believed to allow pupils to learn about spelling, vocabulary and the development of sentences and paragraphs.

Despite teachers' and pupils' positive perceptions of the use of technology in a language learning classroom, two technical issues – computer application errors and slow internet connections – reportedly constrained their use of the technology. When using the wiki, for example, both teachers and pupils observed that a slow internet connection had caused lengthy loading times for text input and editing activities. To address this technical

issue, teachers sought support from their colleagues; however, their perceptions of this issue were different. Teachers managed to obtain technical support from their colleagues and IT staff.

5.6 Summary of findings from qualitative data analysis

This chapter has presented the findings from the teacher interviews and pupil focus group interviews. First, teachers' perceptions of collaborative writing activities have been discussed. Findings of from the qualitative data analysis showed that collaborative writing activity benefited pupils' learning in that it facilitated knowledge sharing, promoted positive affective effects and it contributed to the development of pupils' social skill. Teachers also mentioned that the arrangement of pupil for a group work influenced their learning activity. The findings also suggested that the arrangement of mixed language ability promoted knowledge sharing and scaffolded pupils' learning, especially the pupils with a low level of language proficiency. Some issues in the practice of collaborative writing activity was highlighted by the teachers, timing issue, peer feedback quality, an insecure learning environment, disruptive behaviour and pupils' preference to work individually.

Second, teachers' perception about the use of technology in collaborative writing was positive. Teachers mentioned that, in addition to help pupils with spelling, wording and sentence structure, and subsequently with the development of a descriptive text, the use of technology helped create an enjoyable learning environment for their pupils and, at the same time, facilitated pupils' motivation to learn. Teachers' concerns about technology use in collaborative writing activity included quantity and quality of facility condition, among other the unreliable internet connection.

Third, the study found that pupils' perceptions of the use of collaborative writing in class were positive. Pupils perceived that working collectively with peers to develop a descriptive text was fun and provides them with many opportunities to learn about vocabulary and grammatical structures of the sentence. Importantly, the pupils felt that, in writing collaboratively, they improved their knowledge of writing. It is interesting that pupils had similar view with teachers about mixed group arrangement; although, pupils felt

uncomfortable working with peers whom they know less well. In addition, pupils also emphasised two strategies which they employed to achieve the objective of group work, namely division and non-division of work. Three issues that preventing pupils from the success of collaborative writing activity were time management, interpersonal conflict and disruptive behaviour.

Four, the pupils were also positive about technology use in collaborative writing. They maintained that using technology during collaborative writing facilitates their learning and creates an enjoyable learning environment. An online dictionary, Google Translate, the Google search engine and Wikipedia were typical applications that pupils use to access learning resources online. With regard to use of the wiki, the pupils claimed that the application was new to them but nevertheless motivating. In addition, the pupils felt that their knowledge of some aspects of their writing, such as spelling, vocabulary and grammar, improved after attending the collaborative writing activity enhanced by the wiki. However, pupils identified two technical issues which negatively affected the use technology in collaborative writing, such as computer errors and slow internet connections.

Five, the findings showed that teachers' and pupils' perception about collaborative writing were similar, particularly when discussing about group work, the benefits of collaborative writing, group arrangements. Similar perceptions was also found when discussing about technology use in EFL classroom. Teachers and pupils were in agreement on the benefits of technology use in collaborative writing and some contextual factors.

Chapter 6 Findings from the quantitative data analysis

This chapter presents the quantitative data analysis findings from three writing tests: a pre-writing test, a post-writing test and a delayed post-test. These tests were designed to investigate the effects on pupils' EFL writing performance of two approaches to the teaching of writing, including the use of e-collaborative CALL and the use of e-resources CALL in EFL collaborative writing. Three groups were formed to examine these effects in an L2 collaborative writing activity: 1) an experimental group, which used both e-collaborative CALL and e-resources CALL; 2) an active control group, which used only e-resources CALL; and 3) a passive control group, which had access to neither e-collaborative CALL nor e-resources CALL. The writing tests were administered to pupils in all three groups before and immediately after the intervention, and then two months after the intervention (using a delayed post-test). Quantitative analysis was performed to answer the following research question.

RQ6 Do two types of technology integration, e-collaborative CALL and e-resources CALL, in an L2 collaborative writing activity affect pupils' writing achievement?

a) Does the e-collaborative CALL group achieve better than the non-CALL group?

b) Does the e-resources CALL group achieve better than the non-CALL group?

c) Does the e-collaborative CALL group achieve better than the e-resources CALL group?

The research hypotheses (H) developed in this study are as follows.

Null hypotheses (H_0):

H_{01} = There is no significant difference in pupils' writing achievements between experiment and passive control groups

H_{02} = There is no significant difference in pupils' writing achievements between experiment and active control groups

H_{03} = There is no significant difference in pupils' writing achievements between active and passive control groups

Alternative Hypotheses (H_a):

H_{a1} = There is a significant difference in pupils' writing achievements between experiment and passive control groups

H_{a2} = There is a significant difference in pupils' writing achievements between experiment and active control groups

H_{a3} = There is a significant difference in pupils' writing achievements between active and passive control groups

In conducting the quantitative analysis, non-parametric tests were employed due to violation of the parametric assumption of normality (as discussed in Chapter 4). A Friedman's test was adopted, as an alternative to one-way repeated measures ANOVA, to evaluate pupils' performance under the three different conditions. In order to follow up the Friedman's test with post hoc tests so that pupils' scores could be compared at different points in time, individual Wilcoxon signed-rank tests were conducted. In this case, the study paired the writing tests to make three comparisons: 1) pre-test/post-test, 2) pre-test/delayed post-test, and 3) post-test/delayed post-test. A false discovery rate (FDR) control was applied to the calculation, so differences across the three conditions are reported based on the FDR *p* value (*q*).

In order to examine mean differences across the three independent groups, a Kruskal-Wallis test was carried out as the non-parametric equivalent of a one-way independent ANOVA. This test was followed up with post hoc analysis using a Mann-Whitney test in order to investigate mean differences between three paired groups: 1) experiment and active control groups, 2) experiment and passive control groups, and 3) active and passive control groups. It is important to note that in the Mann-Whitney test not all the conditions could be examined at the same time, which is a limitation of the study. Table 6.1 below illustrates the non-parametric tests applied in the study.

Table 6.1 Non-parametric statistical tests applied

Condition	Examination	Test
Two conditions	Within-subject (paired writing test)	Wilcoxon test
	Between-subject (paired groups)	Mann-Whitney test
Three conditions	Within-subject (across the three conditions)	Friedman's test
	Between-subject (across the groups)	Kruskal-Wallis test

To follow up the Mann-Whitney test, the study evaluated the size of the effect of all mean differences. The effect size *r*, indicating the size of effect contributed by each type of intervention, was interpreted using Cohen's (1988) categories of small, medium, large, as shown in Table 6.2.

Table 6.2 Cohen's (1988) effect size

Measures		Effect size*		
		Small	Medium	Large
Standardised mean difference	*D*	0.20	0.50	0.80
Correlation coefficient	*r*	0.10	0.30	0.50

* The effect size also applies to |-*r*|

The following sections will discuss pupils' writing achievements in all research groups before and after the intervention. Section 6.1 will compare pupils' writing achievements before the intervention. In Section 6.2, pupils' achievements in the timed writing tests (pre-, post- and delayed-post) will be compared for all the research groups, and a comparison of pupils' writing achievements after the intervention will be presented. Finally, Section 6.3 will summarise the chapter.

6.1. Pupils writing achievements before the intervention

This section presents data relating to pupils' writing achievements before the intervention. Data were gathered from the pre-writing tests of the three research groups: the experimental group (*N* = 60), the active control group (*N* = 59) and the passive control group (*N* = 53). Descriptive statistics for each writing aspect are presented in Table 6.3 below.

Table 6.3 Pre-writing test results for experiment, active control and passive control groups

Aspect of writing		Group		
		Experiment	Active control	Passive control
Vocabulary	*M*	1.733	1.864	2.226
	SD	0.821	0.937	0.609
Syntax	*M*	1.633	1.610	1.679
	SD	0.663	0.588	0.613
Cohesion	*M*	1.917	1.627	2.000
	SD	0.561	0.692	0.620
Generic structure	*M*	1.950	2.102	2.226
	SD	0.622	0.687	0.669
Communicative purpose	*M*	2.233	2.407	2.415
	SD	0.698	0.529	0.535
Overall pre-test score	*M*	9.133	8.932	10.415
	SD	2.574	2.572	2.373

A Kruskal-Wallis test (*H*) was conducted to examine whether there were differences in pupils' achievements between the three groups prior to the intervention. The findings of the overall pre-test score show that there were significant differences in scores between the three research groups: $H(2) = 10.580$, $p = 0.005$. The findings also indicate that a number of writing aspects, such as vocabulary, cohesion and generic structure performance, were also significantly different: $H_{vocabulary}(2) = 12.434$, $p = 0.002$, $H_{Cohesion}(2) = 10.895$, $p = 0.004$, $H_{Generic\_structure}(2) = 18.891$, $p = 0.000$. However, two writing aspects, syntax and communicative purpose, were not significantly different: $H_{Syntax}(2) = 0.211$, $p = 0.900$, $H_{Com\_purpose}(2) = 3.499$, $p = 0.174$.

To determine where the differences between the three groups lay, a Mann-Whitney post hoc test was carried out. For this comparison, the groups were paired as follows.

Pair 1: experiment and active control groups

Pair 2: experiment and passive control groups

Pair 3: active and passive control groups

An FDR alpha value (*q*) was used to report the effects.

6.1.1. Comparison of experiment and active control groups

Comparison of the overall pre-test scores from the experimental and active control groups showed that the groups were not significantly different: U = 1,654, Z = -0.622, p = 0.534 (q = 0.050). When comparing the groups in terms of specific writing aspects, only cohesion emerged as significantly different: U = 1,340, Z = -2.55, p = 0.010. No significant differences were found in other writing aspects, such as vocabulary, syntax, generic structure and communicative purpose. Table 6.5 displays these results.

Table 6.4 Mann-Whitney pre-test for experiment and active control groups

	Vocabulary	**Syntax**	**Cohesion**	**Generic Structure**	**Communicative Purpose**
Mann-Whitney U	1,529.5	1,762.5	1,340.0	1,553.5	1,507.0
Z	-1.425	-0.045	-2.575	-1.237	-1.585
p	0.154	0.964	0.010	0.216	0.113
q	0.050	0.050	0.033	0.050	0.050

An effect size test was deployed to examine the difference in cohesion scores between the experimental and active control groups. The results show that the effect of cohesion for the experimental and the active control groups was relatively small: $r_{Cohesion}$ = -0.236.

The following sub-sections will compare pupils' writing achievements between paired groups. Sub-section 6.12 will compare the experimental and passive control groups.

6.1.2. Comparison of experiment and passive control groups

Comparison of the experimental and passive control groups showed that their overall pre-test scores differed significantly: U = 1,161, Z = -2.461, p = 0.013. However, when comparing the groups in terms of specific writing aspects, the groups differed significantly only in the scores for vocabulary and generic structure: $U_{Vocabulary}$ = 1,033.5, Z =-3.645, p = 0.000 and $U_{Generic\_structure}$= 1,047, Z = -3.488, p = 0.000. Other aspects, such as syntax, cohesion and communicative purpose, did not differ significantly, as shown in Table 6.5.

Table 6.5 Mann-Whitney pre-test for experiment and passive control groups

	Vocabulary	Syntax	Cohesion	Generic Structure	Communicative Purpose
Mann-Whitney U	1,033.5	1,532.5	1,482.5	1,047	1,342
Z	-3.645	-0.369	-0.735	-3.488	-1.613
p	0.000	0.712	0.462	0.000	0.107
q	0.017	0.033	0.050	0.033	0.017

The effect size was calculated on the vocabulary and generic structure aspects of writing for the experimental and passive control groups. These results show that the effect size was medium: $r_{Vocabulary}$ = -0.343 and $r_{Generic\_Structure}$ = -0.236.

6.1.3. Comparison of active and passive control groups

Comparison of the active and passive control groups indicates that their overall pre-test scores were significantly different: U = 1,037.5, Z = -3.086, p = 0.002 (q = 0.017). However, when comparing the groups in term of specific writing aspects, only the scores for cohesion and generic structure were significantly different: U_{Cohesion} = 1,107, Z =-2.942, p = 0.003, and $U_{\text{Generic\_structure}}$ = 930, Z =-3.949, p = 0.000, as shown in Table 6.6.

Table 6.6 Mann-Whitney pre-test for active and passive control groups

	Vocabulary	Syntax	Cohesion	Generic Structure	Communicative Purpose
Mann-Whitney U	1,275.5	1,498.5	1,107	930	1,549.5
Z	-1.928	-0.430	-2.942	-3.949	-0.094
p	0.054	0.668	0.003	0.000	0.925
q	0.033	0.017	0.017	0.017	0.050

To follow up the above findings, an effect size test was deployed to examine the difference in cohesion and generic structure between the active and passive control groups. A small effect size was observed in cohesion ($r_{cohesion}$ = -0.278), and a medium effect size emerged only for generic structure ($r_{Generic\_structure}$ = -0.373).

In summary, the results of the Kruskal-Wallis and Mann-Whitney tests indicate that pupils' writing achievements differed significantly prior to the intervention. In particular, there were significant differences in the writing aspects of syntax and communicative purpose. Interestingly, pupils in the passive control group had the highest mean in the pre-test scores, while pupils in the experimental and active control groups were similar in their writing competence.

6.2. Effect of technology integration in L2 collaborative writing on pupils' writing achievements

This section presents data relating to pupils' writing achievements after the intervention, including the post-test and the delayed post-test. Specifically, it compares pupils' writing achievements in these two writing tests (after the intervention) to the pre-tests (before the intervention) in order to examine the effect of technology integration in L2 collaborative writing on pupils' writing achievements. Pupils' writing achievements after the intervention are described statistically in Table 6.7 and Table 6.8.

Table 6.7 Pupils' writing achievements in the post-test

Aspect of writing		Experimental group	Active control group	Passive control group
Vocabulary	*M*	2.25	2.322	2.491
	SD	0.68	0.706	0.724
Syntax	*M*	2.033	1.78	2.038
	SD	0.802	0.767	0.619
Cohesion	*M*	2.05	2.119	2.377
	SD	0.675	0.672	0.562
Generic structure	*M*	1.95	2.102	2.226
	SD	0.622	0.687	0.669
Communicative purpose	*M*	2.65	2.593	2.792
	SD	0.659	0.722	0.689
Overall test score	*M*	10.933	10.915	11.925
	SD	2.693	2.973	2.716

Table 6.8 Pupils' writing achievements in the delayed post-test

Aspect of writing		Experimental group	Active control group	Passive control group
Vocabulary	*M*	1.933	1.763	2.189
	SD	0.607	0.597	0.622
Syntax	*M*	1.667	1.508	1.717
	SD	0.629	0.569	0.662
Cohesion	*M*	1.967	1.746	2.000
	SD	0.581	0.604	0.707
Generic structure	*M*	2.05	1.712	2.094
	SD	0.649	0.72	0.791
Communicative purpose	*M*	2.45	2.136	2.415
	SD	0.534	0.629	0.602
Overall test score	*M*	10.067	8.864	10.415
	SD	2.201	2.36	2.742

Pupils' writing achievements in the post-test, as shown in Table 6.7, were higher for the active control group than for the experimental and passive control groups. In addition,

pupils from the active group had a higher average scores than the experimental group, in particular for vocabulary, cohesion, generic structure and overall score. Pupils' writing achievements in the delayed post-test were interesting. As shown in Table 6.8, the average score for pupils' achievements was lower than for the post-test. More importantly, the average score for the writing achievements of pupils in the passive control group remained higher than for the other two groups.

6.2.1. Comparison of timed writing tests for each research group

In this sub-section, the timed writing tests (pre-test, post-test, and delayed post) for each research group are compared. A Friedman's test (χ^2) was employed for this comparison, as a one-way repeated measures ANOVA. Wilcoxon tests (*T*) and effect size tests were also performed to determine where and to what degree the intervention had been most effective. The following three comparisons of the scores were performed.

Pair 1: Pre-test/post-test

Pair 2: Post-test/delayed post-test

Pair 3: Pre-test/delayed post-test

FDR adjustments (*q*) were made to the alpha values and are used to report all the effects.

Comparison of the timed writing tests of the experimental group

Data regarding the writing achievements of pupils from the experimental group (*N* = 60) were collected from the pre-test, post-test and delayed post-test, as summarised in Table 6.9.

Table 6.9 Experimental group pupils' achievements in the timed writing tests (N = 60)

Writing aspect		Timed writing tests		
		Pre-test	Post-test	Delayed post
Vocabulary	*M*	1.733	2.25	1.933
	SD	0.821	0.68	0.607
Syntax	*M*	1.633	2.033	1.667
	SD	0.663	0.802	0.629
Cohesion	*M*	1.917	2.05	1.967
	SD	0.561	0.675	0.581
Generic structure	*M*	1.95	1.95	2.05
	SD	0.622	0.622	0.649
Communicative purpose	*M*	2.233	2.65	2.45
	SD	0.698	0.659	0.534
Overall test score	*M*	9.133	10.933	10.067
	SD	2.574	2.693	2.201

Comparison of the three writing tests for the experimental group show significant differences in four aspects of writing, excluding cohesion: $\chi^2_{Vocabulary}(2) = 18.140$, $p = 0.000$, $\chi^2_{Syntax}(2) = 10.551$, $p = 0.005$, $\chi^2_{Generic\_Structure}(2) = 17.484$, $p = 0.000$, $\chi^2_{Communicative\_Purpose}(2) = 14.397$, $p = 0.001$. The overall score was also significantly different: $\chi^2_{Overall\_score}(2) = 12.027$, $p = 0.002$ (see Table 6.10).

Table 6.10 Friedman's test ($\chi 2$) of timed writing tests for the experimental group

Aspect of writing	Vocabulary	Syntax	Cohesion	Generic structure	Communicative Purpose	Overall score
$\chi^2(2)$	18.140	10.551	2.260	17.484	14.397	12.027
P	0.000	0.005	0.323	0.000	0.001	0.002

Since significant differences were found in vocabulary, syntax, generic structure and communicative purpose, and in the overall score, Wilcoxon tests (*T*) and effect size tests were performed to examine these differences between three pairs: Pair 1 (pre-test/post-test), Pair 2 (post-test/delayed post-test), and Pair 3 (pre-test/delayed post-test). Table 6.11, Table 6.12 and Table 6.13 present the results of the paired test comparisons for each pair.

Table 6.11 Wilcoxon test (T) for Pair 1 (pre-test/post-test) for the experimental group

Test	Vocabulary	Syntax	Generic structure	Communicative Purpose	Overall score
Mean difference *D*	0.517	0.400	0.333	0.417	1.800
Wilcoxon test *T*	577.5	655.5	293.5	525.0	1,177.0
Z	-3.652	-2.733	-3.239	-3.228	-4.104
p	0.000	0.006	0.001	0.001	0.000
q	0.017	0.033	0.033	0.017	0.017
r	-0.333	-0.249	-0.296	-0.295	-0.375

Table 6.12 Wilcoxon test (T) for Pair 2 (post-test/delayed-test) for the experimental group

Test	Vocabulary	Syntax	Generic structure	Communicative Purpose	Overall score
Mean difference *D*	-0.317	-0.367	0.100	-0.200	-0.867
Wilcoxon test *T*	120.0	98.0	226.5	210.0	536.5
Z	-2.969	-3.202	-0.965	-1.947	-2.147
p	0.003	0.001	0.334	0.052	0.032
q	0.033	0.017	0.050	0.050	0.050
r	-0.271	-0.292	-0.088	-0.178	-0.196

Table 6.13 Wilcoxon test (T) for Pair 3 (pre-test/delayed-test) for the experimental group

Test	Vocabulary	Syntax	Generic structure	Communicative Purpose	Overall score
Mean difference *D*	0.200	0.033	0.333	0.217	0.933
Wilcoxon test *T*	287.0	329.5	499.0	450.0	954.0
Z	-1.602	-0.258	-3.807	-2.082	-2.431
p	0.109	0.797	0.000	0.037	0.015
Q	0.050	0.050	0.017	0.033	0.033
R	-0.146	-0.024	-0.348	-0.190	-0.222

Comparison of the pre-test and post-test data for the experimental group, as presented in Table 6.11, shows that the results differed significantly in some aspects of writing, including vocabulary, syntax, generic structure, communicative purpose and the overall score. The effect of these differences was small for three aspects (r_{syntax} = -0.249, $r_{generic\_structure}$ = -0.296, $r_{communicative\ \_purpose}$ = -0.295), while for vocabulary and the overall score, the effect was medium ($r_{vocabulary}$ = -0.333 and $r_{overall\_score}$ = -0.375).

In addition, as shown in Table 6.12, comparison of the post-test and delayed post-test data shows that the two tests differed significantly in vocabulary, syntax and the overall score, with small effect sizes: $T_{vocabulary}$ = 120.0, p = 0.003, r = -0.271, T_{syntax} = 98.0, p = 0.001, r = -0.292, and $T_{overall\_score}$ = 536.5, p = 0.032, r = -0.196. Finally, comparison of the pre-test and delayed post-test data showed that only generic structure and overall score were

significantly different, with medium and small effect size: $T_{generic\_strucutre}$ = 499.0, p = 0.000, r = -0.348; and $T_{overall\_score}$ = 954.0, p = 0.015, r = -0.222.

In summary, statistical analysis of the paired tests for the experimental group showed that the pupils' writing achievements differed significantly. In particular, the post-test scores were higher than for the pre-test. This finding indicates that the use of e-collaborative CALL during the L2 collaborative writing affected pupils' writing achievements, particularly their use of vocabulary, syntax, generic structure and communicative purpose. However, it is surprising that pupils' writing achievements decreased in the delayed post-test. This decrease suggests that there was no long-term effect of e-collaborative CALL on pupils' writing achievements, except for the generic structure aspect of writing.

Comparison of the timed writing tests of the active control group

In the active control group, a total of 59 pupil participants attended the timed writing tests. Table 6.14 summarises the data gathered from the pre-, post- and delayed post-tests.

Table 6.14 Active control group pupils' achievements in the timed writing tests (N = 59)

Writing aspect		**Timed writing tests**		
		Pre-test	**Post-test**	**Delayed post**
Vocabulary	*M*	1.864	2.322	1.763
	SD	0.937	0.706	0.597
Syntax	*M*	1.61	1.78	1.508
	SD	0.588	0.767	0.569
Cohesion	*M*	1.627	2.119	1.746
	SD	0.692	0.672	0.604
Generic structure	*M*	2.102	2.102	1.712
	SD	0.687	0.687	0.72
Communicative purpose	*M*	2.407	2.593	2.136
	SD	0.529	0.722	0.629
Overall test score	*M*	8.932	10.915	8.864
	SD	2.572	2.973	2.36

Comparison of the three writing tests showed that they differed significantly in all aspects, including vocabulary, syntax, cohesion, generic structure, communicative purpose and the overall score, as shown in Table 6.15.

Table 6.15 Friedman's test ($\chi 2$) of timed writing tests for the active control group

Aspect of writing	Vocabulary	Syntax	Cohesion	Generic structure	Communicative Purpose	Overall score
$\chi^2(2)$	26.028	7.017	19.554	25.836	18.602	30.039
P	0.000	0.030	0.000	0.000	0.000	0.000

A Wilcoxon test (*T*) was deployed to follow up this finding. Three comparisons were made to evaluate differences in the writing aspects: Pair 1 (pre-test/post-test), Pair 2 (post-test/delayed post-test) and Pair 3 (pre-test/delayed post-test). Table 6.16, Table 6.17 and Table 6.16 show the Wilcoxon test results for each paired test.

Table 6.16 Wilcoxon test (T) for Pair 1 (pre-test/post-test) for the active control group

Test	Vocabulary	Syntax	Cohesion	Generic structure	Communicative Purpose	Overall score
Mean difference *D*	0.458	0.169	0.492	0.678	0.186	1.983
Wilcoxon test *T*	391.0	322.0	644.0	519.0	295.0	955.5
Z	-2.932	-1.597	-3.837	-4.400	-1.864	-4.157
p	0.003	0.110	0.000	0.000	0.062	0.000
q	0.033	0.033	0.033	0.017	0.050	0.033
r	-0.270	-0.147	-0.353	-0.405	-0.172	-0.383

Table 6.17 Wilcoxon test (T) for Pair 2 (post-test/delayed-test) for the active control group

Test	Vocabulary	Syntax	Cohesion	Generic structure	Communicative Purpose	Overall score
Mean difference *D*	-0.559	-0.271	-0.373	-0.390	-0.458	-2.051
Wilcoxon test *T*	0.0	44.0	9.5	24.0	42.0	39.0
Z	-5.260	-3.00	-3.989	-4.124	-4.310	-5.508
p	0.000	0.003	0.000	0.000	0.000	0.000
q	0.017	0.017	0.017	0.033	0.017	0.017
r	-0.484	-0.276	-0.367	-0.380	-0.397	-0.507

Table 6.18 Wilcoxon test (T) for Pair 3 (pre-test/delayed-test) for the active control group

Test	Vocabulary	Syntax	Cohesion	Generic structure	Communicative Purpose	Overall score
Mean difference *D*	-0.102	-0.102	0.119	0.288	-0.271	-0.068
Wilcoxon test *T*	318.0	159.5	355.0	417.0	130.5	711.5
Z	-0.535	-1.134	-1.087	-2.132	-2.536	-0.269
p	0.593	0.257	0.277	0.033	0.011	0.788
q	0.050	0.050	0.050	0.050	0.033	0.050
r	-0.049	-0.104	-0.100	-0.196	-0.233	-0.025

As shown in Table 6.16, comparison of the pre- and post-tests indicates that three aspects of writing (vocabulary, cohesion and generic structure) as well as the overall score differed significantly, with an effect size ranging between small and medium: $T_{vocabulary}$ = 391.0, p = 0.003, r = -0.270; $T_{cohesion}$ = 644.0, p = 0.000, r = -0.353; $T_{generic\_structure}$ = 519.0, p = 0.000, r = -0.405; and $T_{overall\_score}$ = 955.5, p = 0.000, r = -0.383. In addition, as shown in

Table *6.17*, comparison of the post-test and delayed post-test data show that the scores for the two tests differed significantly, and the *p*-value for all writing aspects was lower than the *FDR p* (*q*). All significant effect sizes were small. Finally, comparison of the pre-test and delayed post-test data showed that the tests differed significantly, particularly in the aspects of generic structure and communicative purpose: $T_{generic\_structure}$ = 417.0, p = 0.033, r = -0.196; $T_{communicative\_purpose}$ = 711.5, p = 0.011, r = -0.233. The effect size of these differences was small for all aspects of writing (see Table 6.18). These findings indicate that the use of e-resources CALL in an L2 collaborative writing activity for the active control group improved pupils' writing achievements within the group, although the effect of the use of this type of technology was relatively small.

Comparison of the timed writing tests of the passive control group

The quantitative data regarding the writing achievements of pupils in the passive control group were gathered from the pre-, post-, and delayed post-tests, as summarised in Table 6.19.

Table 6.19 Passive control group pupils' achievements in the timed writing tests (N = 53)

Writing aspect		**Timed writing tests**		
		Pre-test	**Post-test**	**Delayed post**
Vocabulary	*M*	2.226	2.491	2.189
	SD	0.609	0.724	0.622
Syntax	*M*	1.679	2.038	1.717
	SD	0.613	0.619	0.662
Cohesion	*M*	2.000	2.377	2.000
	SD	0.62	0.562	0.707
Generic structure	*M*	2.226	2.226	2.094
	SD	0.669	0.669	0.791
Communicative purpose	*M*	2.415	2.792	2.415
	SD	0.535	0.689	0.602
Overall test score	*M*	10.415	11.925	10.415
	SD	2.373	2.716	2.742

Comparison of the pre-, post- and delayed post-tests of pupils in the passive control group showed that the pupils' writing achievements in the three writing tests were significantly different in terms of overall score and in all aspects of writing except the generic structure aspect ($\chi^2_{generic\_structure}(2) = 1.389$, $p = 0.499$), as shown in Table 6.20.

Table 6.20 Friedman's test ($\chi 2$) of timed writing tests for the passive control group

Aspect of writing	Vocabulary	Syntax	Cohesion	Generic structure	Communicative Purpose	Overall score
$\chi^2(2)$	6.826	12.950	14.587	1.389	15.500	12.074
P	0.033	0.002	0.001	0.499	0.000	0.002

To follow up this finding, post hoc analysis was performed using a Wilcoxon test (*T*). Three comparisons were made in this analysis: Pair 1 (pre-test/post-test), Pair 2 (post-test/delayed post-test) and Pair 3 (pre-test/delayed post-test). Table 6.21, Table 6.22 and Table 6.23 present the results from the Wilcoxon test (*T*).

Table 6.21 Wilcoxon test (T) for Pair 1 (pre-test/post-test) for the passive control group

Test	Vocabulary	Syntax	Cohesion	Communicative Purpose	Overall score
Mean difference *D*	0.264	0.358	0.377	0.377	1.509
Wilcoxon test *T*	237.0	299.0	419.5	315.5	921.5
Z	-2.161	-3.528	-3.244	-3.328	-3.448
p	0.031	0.000	0.001	0.001	0.000
q	0.033	0.017	0.033	0.017	0.017
r	-0.210	-0.343	-0.315	-0.323	-0.335

Table 6.22 Wilcoxon test (T) for Pair 2 (post-test/delayed-test) for the passive control group

Test	Vocabulary	Syntax	Cohesion	Communicative Purpose	Overall score
Mean difference *D*	-0.302	-0.321	-0.377	-0.377	-1.509
Wilcoxon test *T*	69.0	91.0	65.0	62.5	189.5
Z	-2.746	-2.797	-3.305	-3.328	-3.292
p	0.006	0.005	0.001	0.001	0.001
q	0.017	0.033	0.017	0.017	0.033
r	-0.267	-0.272	-0.321	-0.323	-0.320

Table 6.23 Wilcoxon test (T) for Pair 3 (pre-test/delayed-test) for the passive control group

Test	Vocabulary	Syntax	Cohesion	Communicative Purpose	Overall score
Mean difference *D*	-0.038	0.038	0.000	0.000	0.000
Wilcoxon test *T*	150.5	202.5	189.5	115.5	627.5
Z	-0.352	-0.365	-0.013	0.000	-0.150
p	0.725	0.715	0.990	1.00	0.880
q	0.050	0.050	0.050	0.050	0.050
r	-0.034	-0.035	-0.001	0.000	-0.015

As shown in Table 6.21, comparison of the pre- and post-test data showed that there were significant differences between results for the two tests in all aspects of writing and the overall score: $T_{vocabulary}$ = 237.0, p = 0.031; T_{syntax} = 299.0, p = 0.000; $T_{cohesion}$ = 419.5, p = 0.001; $T_{communicative\_purpose}$ = 315.5, p = 0.001; and $T_{overall\_score}$ = 921.5, p = 0.000. The effect size was calculated to determine the level of the differences. This indicates that almost all writing aspects experienced a medium effect, except the vocabulary aspect which was small (r = *-0.210*). In addition, as shown in Table 6.22, comparison of the post- and delayed post-test data showed similar results to the pre- and post-test data comparison. The two tests were significantly different in all aspects of writing, including vocabulary, syntax, cohesion, communicative purpose and the overall score. The effect of these differences was small for vocabulary and syntax ($r_{vocabulary}$ = -0.267, r_{syntax} = -0.272), and medium for cohesion, communicative purpose and the overall score ($r_{cohesion}$ = -0.321, $r_{communicative\_purpose}$ = -0.323, $r_{overall\_score}$ = -0.320). Finally, comparison of the pre- and delayed post-test data from the passive control group showed that the results did not differ significantly (see Table 6.23). These findings suggest that the practice of collaborative writing in the passive control group led to an improvement in the pupils' writing achievements.

Comparison of the timed tests for each research group, as presented in the above sub-sections, showed that pupils' achievements in the three writing tests were not significantly different between the three groups. The Friedman's tests for each group suggests that significant differences in pupils' achievements occurred. Pupils' writing achievements in all three groups were higher in the post-test than in the pre-test. Post hoc analysis using the Wilcoxon test showed that pupils' achievements in these two tests differed significantly in many aspects of writing. In the experimental group, the differences were in vocabulary, syntax, generic structure, communicative purpose and the overall score, whereas in the active control group, differences were detected in vocabulary, cohesion, generic structure and the overall score, and in the passive control group, differences were observed in all writing aspects and the overall score. The effect of such increases ranged between small and medium. However, pupils' writing achievements in all three groups decreased in the delayed post-test.

6.2.2. Comparison of pupils' writing achievements between the research groups

In this sub-section, pupils' writing achievements across the three research groups are compared. A Kruskal-Wallis test was performed to make this comparison. Table 6.24 presents the results of a Kruskal-Wallis test on data from the three research groups in the post-test.

Table 6.24 Kruskal-Wallis test results for the three research groups

Test	Vocabulary	Syntax	Cohesion	Generic structure	Communicative Purpose	Overall score
Post-test χ^2 (2)	2.340	4.451	9.179	5.991	2.957	5.929
P	0.310	0.108	0.010	0.050	0.228	0.052

Comparison of the post-test scores across the three research groups produces an interesting result. In the post-test, pupils' writing achievements did not differ significantly except in the cohesion aspect: $H_{Cohesion}(2) = 9.179$, $p = 0.010$ (see Table 6.24). This finding indicates that, after the intervention, pupils' writing achievements across the research groups were relatively similar, except for the aspect of cohesion. Mann-Whitney tests were thus employed to follow up these findings. Three comparisons of the scores were made for the three groups (see Table 6.25).

Pair 1: Experiment/active control groups

Pair 2: Experiment/passive control groups

Pair 3: Active control/passive control groups

Table 6.25 Mann-Whitney test comparing post-test results between experiment and active control groups

Test	Cohesion		
	Pair 1	Pair 2	Pair 3
U	1,709.500	1,166.500	1,203.000
Z	-0.379	-2.801	-2.410
p	0.705	0.005	0.016
q	0.050	0.017	0.033
r	-0.035	-0.264	-0.228

As presented in Table 6.25, post-test comparison of the experimental and active control groups showed that the groups did not differ significantly ($p > q$). This finding indicates that use of e-collaborative CALL and e-resources CALL produced similar results. In addition, for Pairs 2 and 3, pupils' writing achievements were significantly different. The

effect for these paired groups was small. This suggests that pupils' writing achievements for cohesion were significantly different between the experimental and passive control groups and between the active and passive control groups, with a small effect.

In summary, statistical analysis of the pupils' writing achievements in the post-test showed that there was no significant difference in the scores for most aspects of writing. Furthermore, it is interesting that pupils in the passive control group scored higher than those in the experimental and active control groups. The findings indicate that the use of two types of technology (e-collaborative CALL and e-resources CALL) in L2 collaborative writing did not help improve the pupils' achievements in writing English compared with pupils in the passive control group. Accordingly, the study did not further examine the difference in pupils' writing achievements in the delayed post-test.

6.3. Summary of the quantitative findings

Two key findings emerge from the quantitative data analysis. First, the analysis showed that all participating groups improved their writing scores in the post-test. In the experimental group, all writing aspects improved, including vocabulary, syntax, generic structure, communicative purpose and the overall score. In the active control group, improvements occurred in vocabulary, cohesion, and generic structure. In the passive control group, vocabulary, syntax, cohesion and communicative purpose were shown to improve. However, pupils' writing achievements in all research groups were lower in the delayed post-test.

Second, the results suggest that integration of technology in L2 collaborative writing had no effect on the pupils' writing achievements. Pupils who had access to e-collaborative CALL and those who had access to e-resources CALL achieved no better than pupils who engaged in L2 collaborative writing with no technology. More importantly, the writing achievements of pupils with no technology support were higher than those of pupils who had access to e-collaborative CALL and e-resources CALL. Furthermore, pupils who had access to e-collaborative CALL did not achieve better than pupils who only had access to e-resources CALL. With regard to aspects of the pupils' writing, the findings show that only cohesion was affected by the integration of technology.

Chapter 7 Discussions

As stated in Chapters 1 and 4, this study set out to examine: 1) teachers' and pupils' perceptions of collaborative writing and the use of technology in EFL collaborative writing, and 2) the effect of technology in collaborative writing on pupils' writing achievements in EFL secondary schools in Indonesia. Six research questions were addressed in the study:

RQ1 *What are Indonesian junior secondary school teachers' perceptions of L2 collaborative writing activities?*

- *a) What are teachers' perceptions of collaborative activities before and after the implementation of an L2 collaborative writing activity?*
- *b) Do teachers' perceptions of collaborative activities change following the implementation of an L2 collaborative writing activity?*

RQ2 *What are Indonesian junior secondary school teachers' perceptions of technology use in L2 collaborative writing?*

- *a) What are teachers' perceptions of technology use in L2 collaborative writing before and after the implementation of an L2 collaborative writing activity enhanced with computer technology?*
- *b) Do teachers' perceptions of technology use in L2 collaborative writing change following the implementation of an L2 collaborative writing activity enhanced with computer technology?*

RQ3 *What are Indonesian junior secondary school pupils' perceptions of L2 collaborative writing activities?*

- *a) What are pupils' perceptions of collaborative writing before and after the implementation of an L2 collaborative writing activity?*
- *b) Do pupils' perceptions of collaborative writing change following the implementation of an L2 collaborative writing activity?*

RQ4 *What are Indonesian junior secondary school pupils' perceptions of technology use in L2 collaborative writing?*

- *a) What are pupils' perceptions of technology use in L2 collaborative writing before and after the implementation of an L2 collaborative writing activity enhanced with computer technology?*

b) *Do pupils' perceptions of technology use in L2 collaborative writing change following the implementation of an L2 collaborative writing activity enhanced with computer technology?*

RQ5 Is there any difference between teachers' and pupils' perceptions of L2 collaborative writing and of technology use in L2 collaborative writing?

a) *Do teachers' perceptions of collaborative writing differ from pupils' perceptions before and after the implementation of an L2 collaborative writing activity?*

b) *Do teachers' perceptions of technology use in L2 collaborative writing differ from pupils' perceptions before and after the implementation of an L2 collaborative writing activity enhanced with computer technology?*

RQ6 Do two types of technology integration, e-collaborative CALL and e-resources CALL, in an L2 collaborative writing activity affect pupils' writing achievements?

a) *Does the e-collaborative CALL group achieve better than the non-CALL group?*

b) *Does the e-resources CALL group achieve better than the non-CALL group?*

c) *Does the e-collaborative CALL group achieve better than the e-resources CALL group?*

A mixed method with a convergent parallel design was employed in this study to collect data from six teachers and 172 pupils drawn from six different schools. Qualitative data were gathered from interviews with teachers and focus group interviews with pupils to address research questions 1 to 5. The findings of this qualitative data analysis have been presented in Chapter 5. In addition to the qualitative data, writing tests were given to pupils to gather data related to their writing achievements. These quantitative data were analysed to address research question 6, and the findings have been detailed in Chapter 6. In this chapter, the findings from both qualitative and quantitative data are cross-validated in order to gain a deeper understanding of the integration of e-collaborative CALL and e-resources CALL technology in a collaborative writing activity, and the effect of such technology integration on pupils' writing achievements.

This chapter will discuss the findings of the qualitative and quantitative data analysis, drawing on sociocultural theory in language learning and technology integration. As discussed in Chapter 3, Vygotsky 's (1978) sociocultural theory (SCT) suggests that human cognitive development is inherently situated in social interaction. There are eight concepts

of sociocultural theory, two of which are adopted in this study: zone of proximal development and mediation. The concept of zone of proximal development takes the view that development of the cognitive and linguistic ability of a child (novice) is facilitated through participation in social interaction and with assistance from more able members of society. Donato (1994) argues that collective support, or mutual interaction during group work, may help learners perform the language beyond their levels of linguistic expertise. The other concept, mediation, refers to "the process which connects the social and individual" (Swain, Steinman & Kinnear, 2015, p. 149), and thus mediational means refer to the use of tools that help individuals to achieve their interactional goals. In a classroom learning context, technology is perceived as a mediational tool that facilitates teacher and pupil interactions (and classroom activities) and their teaching and learning objectives (Lamy & Hampel, 2007; Lim, 2002).

This chapter is organised into four sections. Section 7.1 discusses the practice of collaborative writing activities in Indonesian EFL classrooms, and Section 7.2 centres on technology use in EFL collaborative writing. The effect of technology use on EFL collaborative writing activities is discussed in Section 7.3, and Section 7.4 summarises the chapter.

7.1. Teachers' and pupils' perception about collaborative writing activities

This section discusses the findings from the qualitative data analysis that address research questions 1, 3 and 5, regarding Indonesian teachers' and pupils' perceptions of collaborative writing activities, and whether their perceptions of collaborative writing changed following an intervention. With regard to teachers' and pupils' perceptions of collaborative writing activities, four key findings from the qualitative data analysis will be discussed: 1) benefits of collaborative writing activities; 2) factor effecting collaborative writing activities; 3) the effect of collaborative writing activities on pupils' writing achievement; and 4) issues in EFL collaborative writing.

7.1.1. Benefits of collaborative writing activities

In sociocultural theory, learners' involvement in social interactions, such as group work, within a community is viewed as a fundamental construction of their cognitive ability

(Lantolf & Pavlenko, 1995; Lantolf & Thorne, 2006; Thorne, 2005) and as an opportunity for them to shape their social competence in a specific communicative context (Benjamin, Bessant & Watts, 1997; Donato, 2004; Lin, 2015; Zuengler & Miller, 2006). The findings of this study show that pupils' interactions with one another in collaborative writing activities facilitate knowledge sharing, promote positive affect and contribute to the development of their social skills. Teachers believed that pupils were able to initiate, exchange and share ideas with other group members during group activities. With regard to writing in particular, pupils said that they shared their knowledge of vocabulary, spelling and grammar. More importantly, this knowledge sharing seems to have occurred between pupils with higher and lower language abilities, indicating assistance from advanced to novice learners (Donato, 1994; Rasmussen, 2001). Low-achieving pupils found this learning support to be very helpful because they were able to learn from higher-achieving peers. Interviews with pupils revealed that the majority viewed peer feedback as an effective means of learning to write in English. Pupils reported that they had learned about aspects of writing such as vocabulary and sentence structure from comments provided by their group peers. This finding confirms earlier research which suggests the benefits of knowledge sharing and learning support in collaborative writing activities. For example, Storch (2005), who examined the collaborative writing activities of adult ESL students, suggested that collaborative writing activities provide opportunities for learners to interact in various aspects of writing, particularly in generating ideas as to what to write. Fernández Dobao and Blum (2013), who evaluated learners' attitudes towards and perceptions of collaborative writing in pairs and in small groups in a foreign language setting, also found that group work provides opportunities for learners to share more ideas in relation to topics for writing and language use. More importantly, they found that working in groups also enables students to provide and receive learning assistance from peers.

Pupils' mutual interactions during group work also promote learning confidence and increase learning motivation. According to the teachers, the group work activity created a supportive learning environment that provided pupils with chances to produce the target language (i.e. English) and receive comments and feedback from others. Furthermore, these opportunities seem to have helped to increase their confidence in learning and motivation towards using the language in group discussions. More interestingly, pupils perceived that

such exchanges of ideas, sharing comments and feedback during group work were fun and enjoyable. As shown in pupils' interviews, they seemed to enjoy the editing process, in which they identified and corrected errors in peers' text. This finding is in line with those of Fernández Dobao and Blum (2013), Lin (2015) and Shehadeh (2011), who claimed that collaborative activities benefit pupils' learning motivation. For instance, Lin's (2015) study evaluated the effectiveness of collaborative learning in Chinese EFL classrooms at university level and showed a positive relationship between collaborative interaction and students' learning motivation. Students' learning motivation improved significantly following a collaborative learning intervention.

In addition to knowledge sharing and affective factors, pupils' interactions during group activities helped to develop their social skills. As shown in Chapter 5, pupils were able to communicate ideas, demonstrated a willingness to work with others, and showed respect towards peers' ideas and comments. Pupils were also frequently observed offering assistance to others who were experiencing difficulty in their work. Teachers confirmed that pupils were able to start a conversation with others and share their ideas during group discussions. This finding indicates that collaborative activities may function as a pedagogical tool with which to promote interpersonal and team skills. This confirms earlier research conducted by Lin (2015), who investigated the use of collaborative learning in higher-education EFL classrooms and found that collaborative learning could be practised as an option to improve interpersonal and small-group skills. Her study found that research participants gained social benefits from collaborative learning activities, such as building good relationships with others within the group.

7.1.2. Factors affecting effective collaboration in EFL writing activities

The analysis of qualitative data from teachers' interviews and pupils' focus group interviews has shown several factors that affect effective collaboration in EFL writing activities. The factors include group composition, task types used by the teachers and pupils' strategy for collaborative task completion.

Group composition: Mixed-language ability

The qualitative findings presented in Chapter 5 show that teachers were concerned with two types of group arrangements, random and mixed grouping, although both teachers

and pupils seemed to prefer group arrangements with mixed language abilities. Arranging pupils with mixed language abilities was perceived to benefit pupils by sharing knowledge and supporting their learning, especially pupils with low levels of language proficiency. One teacher, Dinda, for example, said: "[I] grouped pupils with mixed ability so that the clever pupils could help the poor ones." More specifically, pupils believe that working with their peers with higher language abilities facilitated their learning to write in English, especially their vocabulary and grammar skills. Whilst pupils with low-level of language ability seem to obtain benefit from mixed-language ability, it is not clear from the present study if pupils with higher-level of language ability are also benefited from the group composition of mixed-language ability.

The benefits of having a group of mixed-level students as found in the present study confirm the results of an earlier study by Watanabe and Swain (2007). Their investigation of the effect of second-language proficiency differences on patterns of interaction in pairs found that group arrangements based on differing language proficiencies facilitate students' learning. The findings from their study show that the quantity of pupils' interactions influences learners' use of language and their achievements in a post-test. Watanabe and Swain suggest that such a benefit only occurs if learners are able to work together with peers in the group, regardless of their partners' level of language proficiency. More importantly, Watanabe and Swain show that discrepancies between learners' language abilities in group work with mixed ability arrangements do not seem to affect the nature of peer assistance or their learning of English.

Task types and pupils' collaborative strategy

The data analysis of interview with teachers and pupils suggest several types of collaborative tasks teachers carried out to promote pupils' knowledge about certain types of text (meaning-focused task) and language form required for the text development (language-focused task) in addition task use to promote interaction in collaborative activities. To remind the readers, in the present study, collaborative writing tasks are viewed as ones that are completed by either a group or a pair (Fernández Dobao & Blum, 2013; Kutnick & Blatchford, 2014; Shahamat & Mede, 2015; Storch, 2005, 2013). In this type of task, several students are assigned to work collectively as "a team for a joint purpose or outcome" (Kutnick & Blatchford, 2014, p. x).

Finding of the present study suggest several task assigned by the teachers to promote collaboration included group discussion, group presentation, jigsaw, arranging jumbled sentences into paragraphs, describing pictures, making dialogue with their focus was on vocabulary, sentence structure, and text structure. For example, in an interview, teachers said that they give pupils a picture and asked them to discuss about the theme of the picture, the characteristics of the object displayed in the image, vocabulary, and how language is used to perform a descriptive function.

Interestingly, while the teachers concerns the use of task to promote group interaction and to draw pupils' focus on meaning and language forms for their writing, pupils were observed to pay more attention on the strategies to complete the collaborative tasks given by the teachers. Two collaborative strategies were emphasised by the pupils: division and non-division of work. This is rather surprising that pupils' strategy to complete collaborative task, either through division of work strategy or non-division strategy, were performed to obtain similar objectives, such as it is to help them: 1) to maintain the focus of each group member on the task so that they could complete it quickly. ; 2) to raise awareness that each group member was responsible for completing the group task; and, more importantly, 3) to provide the pupils with opportunities to experience the process of writing.

As detailed in chapter 5, the earlier strategy allowed pupils to divide the group task into smaller units and distributed the work among the group members. In collaborative writing activities, pupils shared tasks into two smaller units: drafting and editing tasks. Within this division, pupils mentioned that some members of the group would be responsible for drafting a paragraph supported by vocabulary, while others would be responsible for editing the paragraph to eliminate any spelling or grammatical mistakes. The latter non-division strategy suggested pupils to go through writing process collectively. For example, in the development of a descriptive text, the pupils started the work by discussing the writing topic, then writing the text together (Pre-Interview with Wulan).

Pupils' strategies of work division and non-work division to achieve group objectives evidenced in this study correspond with a characteristic of collaborative learning suggested by the literature (see Dillenbourg et al., 1996; Kozar, 2010; Lin, 2015; Mangenot & Nissen, 2006; Nguyen, 2011). For example, Nguyen (2011) states that, in collaboration, students

may distribute sub-tasks between peers in the group, and gather all the tasks together and synthesise them later in order to form the whole group task. According to Dillenbourg et al. (1996, p. 190), such distribution of tasks to group members aims particularly to "construct and maintain a shared conception of a problem".

7.1.3. Positive effect of collaborative writing activities on pupils' writing achievement

Findings of this study suggest a positive effect of collaborative writing activities on pupils' writing achievement. Findings from the qualitative data analysis show three areas of writing in which pupils better achieved following the intervention, i.e. vocabulary, sentence structure, and structure of descriptive text. Teachers observed that following the intervention, pupils wrote more vocabularies and conducted sentence arrangement well in their writing. Although it was not clear from pupils' perception whether their collaborative writing activities had had a positive effect on their writing achievement, findings from the quantitative data analysis support the claim. Pupils' writing achievement in all groups improved throughout the intervention. In the experimental group, improvement was observed in the aspects of vocabulary, syntax, generic structure, and communicative purpose. While in the active control groups, improvement was identified in the aspects of vocabulary, cohesion, and generic structure, in the passive control groups, improvement was seen in all writing aspects. A possible explanation for this finding might be that the three aspects of writing, i.e. vocabulary, syntax, and structure of text (or the generic structure of text), were emphasising both teachers and pupils during the collaborative writing activities. Teachers, for example, carried out several collaborative tasks, such as pictures, games and group discussions, so as to draw pupils' attention to vocabulary, grammar and sentence arrangement in descriptive text.

Despite pupils' better achievement in the post-test, quantitative data analysis in the present study found that pupils' achievement on the delayed test continued to decrease, indicating that pupils did not perform better at the post-intervention. In other words, at the post-intervention, working together with other pupils on a collaborative task does not affect pupils' achievement in writing. This is interesting but not surprising, given that both teachers and pupils did not seem to be familiar with the notion of collaborative writing and regarded the notion as a thing which was new to them. More importantly, limited time for

the intervention, which lasted only four weeks, and less control given over teaching and learning input at the post-intervention would also imply this result.

The findings of this present study agree with the findings of earlier studies in which collaborative activities affected pupils' learning of vocabulary (see Kim, 2008), their grammatical accuracy and sentence structure (Storch, 1999). Kim (2008) compared the effects of collaborative and individual tasks on students' language-learning episodes and L2 vocabulary acquisition. Using a pre-test and post-test design, Kim used dictogloss and examined students' learning of 15 targeted vocabularies. The study found that there was no difference in LREs between students who participated in the collaborative task and those who worked individually. In her study, Storch (1999) examined the effects of pair work and grammatical discussion on students' grammatical accuracy in their writing. Her study found that students who participated in a collaborative task had better grammatical accuracy in their writing. Differing from the earlier studies of Kim (2008) and Storch (1999), the present study was carried out in a junior secondary school context with EFL learners aged 12–13 years. These participants were different from and younger than those in Kim's study, who were Korean as a Second Language (KSL) learners aged 18–26 years, and in Storch's, who were university students attending an English for Academic Purposes (EAP) course.

7.1.4. Issues in EFL collaborative writing activities

Despite participants' perceptions of the benefits of EFL collaborative activities, as discussed in Section 7.1.1, both teachers and pupils encountered issues that might have prevented them from carrying out such activities successfully, e.g. insecure learning environment, disruptive behaviour, and pupils working individually (see also Chapter 5, Sections 5.1.4 and 5.3.4). As discussed earlier in Chapter 5, Section 5.14, teachers preferred to arrange pupils using mixed-language ability composition. This allows a group to have pupils with high, medium and low language ability. Discrepancies in pupils' level of language ability apparently not only influenced the way in which pupils interacted with other group members but also resulted in interpersonal conflicts among them. For example, some pupils with high levels of language ability were reluctant to work with those with low language ability. These high-ability pupils felt that those with low ability did not appear to possess

adequate knowledge of the English language and tended to distract from the group activity. This interpersonal conflict seems to have eventually created an insecure learning environment, particularly concentration problems and disruptive behaviour. For instance, some pupils with lower levels of language ability were observed playing and making jokes, which distracted peers' focus on the task and, more importantly, disrupted their learning.

The issue of interpersonal conflict during group work confirms the findings of earlier studies by Holmes (2003) and Lay (1989). Holmes (2003), who examined a collaborative project of university students in Malaysia, found that working collectively in pairs occasionally involved conflict, and such conflict might result in disintegration of the group. He suggested that social relationships, conflict and networks influence group members' decisions to work collectively. In addition, Lay's (1989) study, which examined interpersonal conflict in collaborative writing from the perspective of gender division, found seven drivers of interpersonal conflict: degree and kind of disclosure, battle over control, ability to trust, perception and acceptance of the group, perception of and attitude towards conflict, degree of congruence between experience and behaviour, and students' expectations towards receiving a reward (p. 13). Lay's study also found that male and female students respond differently towards self-disclosure, and insensitive reactions may end up in dissolution of the relationship. It is interesting that while these studies suggested that pupils' preference towards working individually was primarily a result of interpersonal conflicts during collaborative activities, the present study showed that pupils' choice to work individually was particularly intended to help them better learn English. This is interesting that while these studies suggest that pupils' preference to work individually was primarily as a result of interpersonal conflicts during collaborative activities; the present study suggest that pupils' choice to work individually should also be viewed as one of pupils' learning strategy that allowed them to gain more focus on what they are leaning and this accordingly would help them better learn of English.

In addition, the analysis of qualitative data from teachers' pre- and post-interviews also suggests similar perception of teachers' technological ability, indicating that teachers do not seem to possess more technological ability over the technological training provided in the present study. Limited training time as well as little opportunity given to teachers to experience with the use of technology for collaborative writing activities are seen as

contributing factors to the issue. The implication of this finding for teachers' professional development activity therefore needs attention from the school as well as the policy makers.

7.2. Teachers' and pupils' perception about the use of technology in collaborative writing activities and its effect on pupils' writing achievement

This section discusses the findings relating to technology integration that address research questions 2, 4 and 5: teachers' and pupils' perceptions of technology use in L2 collaborative writing, and differences between the two. Two key findings will be discussed: the benefits of technology use in EFL collaborative writing and contextual factors. Discussion of the findings will draw on a sociocultural approach to the technology integration framework that views technology as an element of social activity, mediating between individuals' social interactions and their objectives. The discussion is organised into two sub-sections: Section 7.2.1. focuses on teachers' and pupils' technological competence and their use of technology for teaching and learning of English as a foreign language (EFL), 7.2.2. focuses on teachers' and pupils' positive perceptions of the use of technology in L2 collaborative writing, and Section 7.2.3 focuses on technical issues in collaborative activities that affected these perceptions.

7.2.1. Teachers' and pupils' technological competence and their use of technology for teaching and learning of English as a foreign language (EFL)

The analysis of the interview data showed that all teachers perceive that collaborative writing activities benefit pupils who are learning

Interestingly, teachers' insufficient technological ability does not prevent teachers from using the technology in EFL classrooms. As teachers stated in the interviews, to address their limited technological ability, teachers sought for assistance from their colleagues. Santi for example, stated that she received a short training session from one of her colleagues, Rian, on how to operate a certain computer application that would help her create instructional materials. While Mira, maintained to receive helps from her colleague, Rudi, when uploading some learning materials to the wiki system. Rudi was also said to help

Mira address some technical problems during the collaborative writing activity, including computer errors, problems related to the Internet connection, and wiki loading errors. This finding is in line with the idea of Son et al. (2011), who surveyed the computer literacy and competency of 73 Indonesian teachers. The study found that Indonesian teachers had positive attitudes toward technology and its use in language classrooms, regardless of limited technology facilities and limited internet access. However, they also found that Indonesian EFL teachers, especially primary school teachers, possessed insufficient ability to operate computers and incorporate technology into language classrooms. While Son et al. (2011) address teachers' low levels of computer competence by proposing an intensive computer training programme, the present study suggests that technological support given by colleagues may help teachers and pupils to incorporate technology into classrooms. It is noteworthy that technological assistance need not necessarily be given by colleagues, but may potentially be offered by pupils as evidenced in this study (for example, see interview extract with Mira). This type of support from pupils is discussed by Lim and Khine (2006) who explored barriers to teachers' information and communication technology (ICT) integration in schools. According to Lim and Khine (2006), in order to address technical issues when using technology, a school may employ student helpers, that is, students specially trained in technology by the school.

7.2.2. Teachers' and pupils' perception of technology use in classroom teaching and learning

The qualitative findings show that teachers had positive perceptions of the use of the two types of technology in L2 collaborative writing, e-resources CALL and e-collaborative CALL. The teachers perceived that the incorporation of these two types of technology into classroom instruction benefited them in a number of ways, including helping them to prepare instructional materials with multimedia support, creating an enjoyable learning environment, promoting pupils' learning motivation, providing model texts for their pupils, and helping them to assign homework to their pupils. For example, the teachers observed that the use of electronic devices such as computers and projectors in classrooms was attractive and pleasant for their pupils. Specifically with regard to writing in the classroom, websites were beneficial in providing a number of writing resources from which teachers

could retrieve samples of letters with different purposes to serve as good examples for their pupils.

The qualitative findings also show that the pupils perceived the use of the two types of technology in L2 collaborative writing positively. They mentioned that the use of e-resources and e-collaborative CALL benefited their learning and promoted learning motivation. The use of online applications such as Google search, Google Translate, Wikipedia and websites enabled the pupils to find various models of English texts relevant to their learning to write. With regard to learning motivation, the pupils found teachers' use of computers and projectors that displayed texts with large, colourful pictures and sounds attractive and interactive. Pupils were observed to enjoy this visual representation of text with images and sounds, as these also helped them discern information that their teachers displayed on the screen.

The use of some computer technology, such as presentation tools, multimedia players and websites, is already common in language classrooms, and the positive effects of using these computer technologies on pupils' attitudes and language learning have been reported in a number of studies. Macaro, Handley and Walter's (2012) systematic review of 117 studies of technology in L2 learning since 1990, for example, shows that the incorporation of technology into language classrooms, especially in primary and secondary education classrooms, has a positive impact on learners' attitudes and behaviour. With regard to the effect of technology on pupils' attitudes, studies by Tsou, Wang and Li (2002) and O'Hara and Pritchard (2008) have shown the positive effects of multimedia presentation on vocabulary acquisition, and studies by Almekhlafi (2006) and Silverman and Hines (2009) show that the use of video in classrooms positively affects pupils' language learning.

In the Indonesian context in particular, the findings of this study suggesting teachers' positive perceptions of the use of technology confirm those of earlier studies by Cahyani and Cahyono (2012) and Son, Robb and Charismiadji (2011). Cahyani and Cahyono (2012), who evaluated teachers' attitudes and the use of technology in Indonesian EFL classrooms, found that Indonesian teachers had a positive attitude toward the use of technology in language classrooms and used laptops and computer applications for their daily teaching and learning practices. The use of technology, as argued by Cahyani and Cahyono (2012), help teachers deliver the instructional materials in the classroom, to provide models of the target language to the students, and it also promotes learning motivation.

With regard to the use of wikis in L2 collaborative writing, teachers and pupils in the present study were reported to have positive perceptions of such use. As discussed in Chapter 5, both teachers and pupils perceived that working with a wiki in a collaborative activity facilitated knowledge sharing and increased pupils' learning motivation. The pupils observed that using a wiki in collaborative writing improved their ability to write in English. This was because they seemed to have a greater awareness of and paid closer attention to spelling, wording and grammatical correctness in the development of texts. For example, Marni, a pupil in the experimental group, said that her knowledge of grammar improved as she learned more about it from peers' comments and feedback on her text. However, the pupils' claim to have improved their knowledge of spelling, wording and grammatical aspects of writing is not supported by the quantitative findings. Statistical analysis of the pupils' timed writing tests shows that the use of wikis in collaborative writing has a positive but insignificant effect on pupils' writing achievements (see also Section 7.3).

With regard to learning motivation, pupils had positive experiences of working collectively with peers using a wiki. They were observed to enjoy working with wikis as they found editing activities, such as adding, deleting and correcting grammatical errors in peers' texts, interesting and challenging. This enjoyable learning environment ultimately increased their motivation to learn about writing. The finding of this study is consistent with those of earlier studies by Li, Chu, and Ki (2014) and Wang (2014), suggesting that wikis promote learners' positive learning experiences of and attitudes to writing in English. Wang (2014), who investigated the use of wikis to facilitate interaction and collaboration among EFL learners, found that the use of wikis in language classrooms increased pupils' motivation to learn English. In addition, the pupils believed that their ability to use the English language, and particularly their ability to write in English, improved through interaction, knowledge sharing and peer learning using wikis.

7.2.3. Technical issues encountered when using technology to facilitate collaborative writing activities

Although the teachers and pupils reported positive perceptions of technology use in L2 collaborative writing, they had negative views about the conditions of technology facilities in schools, which influenced their use of technology in classrooms. For example, many computer facilities, computer applications and internet connections did not function well,

which led to a lengthy process to make computer applications work, while some computers in the computer laboratory ran errors. Specifically with regard to internet access, the teachers and pupils felt that internet access was too slow, which made it difficult for them to work with the wiki. For example, one pupil, Marni, said: "[the internet speed was] really slow. It affected my writing activity [in the wiki] that I had to wait so long." These contextual factors preventing successful technology integration have been identified in earlier studies (e.g. Daugherty & Funke, 1998; Lim & Khine, 2006; Teo, Lee & Chai, 2008). Lim and Khine (2006), who evaluated barriers to teachers' integration of ICT into classrooms in Singapore, indicate several barriers that prevent teachers from incorporating technology, including limited time for using ICT, time spent on preparation, inadequate number of computers available at school, and lack of school support. With regard to using wikis, internet connection problems are a common issue, as reported in previous studies (e.g. Li et al., 2014; Wang, 2014; Woo et al., 2011). For instance, Li et al. (2014), who examined the effect of wikis as a collaborative tool on primary school pupils in China, found that poor network access and malfunctions were technical issues that distracted from pupils' learning and hindered them from completing their work. The findings of this study thus suggest that schools need to improve the quality of their technology facilities to enable successful integration of technology into classrooms, particularly in promoting collaborative writing activities.

7.3. The Effect of technology in collaborative writing activities on pupils' writing achievements

This section discusses the quantitative findings that address research question 6 regarding whether two types of technology integration affect pupils' writing achievements. To corroborate the quantitative findings, some qualitative findings from the teacher and pupil interviews before and after the intervention are also presented.

Two key findings emerge from the quantitative data analysis. First, all participating groups reported an increase in their writing scores for the post-test. As discussed in Chapter 6, in the experimental group, the findings show improvements in all aspects of pupils' writing, including vocabulary, syntax, generic structure and communicative purpose ($T_{vocabulary}$ = 5775.5, p = 0.000, r = -0.333; T_{syntax} = 655.5, p = 0.006, r = -0.249; $T_{generic\_structure}$ = 293.5, p = 0.001, r = -0.296; and $T_{communicative\_purpose}$ = 525.0, p = 0.001, r = -0.017). In the

active control group, improvements occurred in vocabulary, cohesion and generic structure ($T_{vocabulary}$ = 391.0, p = 0.003, r = -0.270; $T_{cohesion}$ = 644.0, p = 0.000, r = -0.353; $T_{generic\_structure}$ = 519.0, p = 0.000, r = -0.405). In the passive control group, some aspects of pupils' writing, including vocabulary, syntax, cohesion and communicative purpose, were reported to have improved ($T_{vocabulary}$ = 237.0, p = 0.031; T_{syntax} = 299.0, p = 0.000; $T_{cohesion}$ = 419.5, p = 0.001; $T_{communicative\_purpose}$ = 315.5, p = 0.001). However, pupils' writing achievements in all research groups were reported to be lower in the delayed post-test. More importantly, the statistical analysis shows that, in the experimental group, pupils' writing achievements in the post-test and in the delayed post-test differed significantly in vocabulary, syntax and the overall score ($T_{vocabulary}$ = 120.0, p = 0.003, r = -0.271; T_{syntax} = 98.0, p = 0.001, r = -0.292; and $T_{overall\_score}$ = 536.5, p = 0.032, r = -0.196). Pupils' writing achievements in the pre-test and delayed post-test were also reported to be significantly different for generic structure and overall score ($T_{generic\_strucutre}$ = 499.0, p = 0.000, r = -0.348; and $T_{overall\_score}$ = 954.0, p = 0.015, r = -0.222).

Second, the findings show that the incorporation of technology into L2 collaborative writing in Indonesian classrooms did not significantly affect pupils' writing achievements. With regard to aspects of pupils' writing, the findings show that only cohesion was affected by the integration of technology ($H_{Cohesion}(2)$ = 9.179, p = 0.010). This finding indicates that pupils who used e-collaborative CALL and those who used e-resources CALL in L2 collaborative writing did not perform better than pupils who carried out the collaborative task without any technology. Interestingly, the findings show that the writing achievements of the latter group of pupils were higher than those of pupils who had access to e-collaborative and e-resources CALL. In addition, the quantitative data analysis reveals no significant difference in writing achievements between pupils in the experimental group and pupils in the active control group (U = 1709.5, p = 0.705). This shows that pupils who had e-collaborative CALL did not achieve better than pupils who attended L2 collaborative writing with only e-resources CALL. More importantly, the findings from the pupil interviews show that, despite pupils' positive perceptions of the use of e-resources CALL and e-collaborative CALL in L2 collaborative writing, their writing achievements in the pre-test and the post-test did not improve. In other words, pupils' positive perceptions of the incorporation of technology into L2 collaborative writing did not seem to be accompanied by any improvement in their writing achievements.

The results of this study do not support those of previous studies demonstrating the positive effect of technology integration on pupils' writing achievements, such as the positive effect of using wikis (e.g. Alshumaimeri, 2011; Wichadee, 2011), the effect of using the Internet as a learning resource, or using Google Translate and electronic dictionaries (see meta-analyses in Golonka et al., 2014; Macaro et al., 2012; Wang & Vásquez, 2012); rather, they are consistent with the results of Li, Chu and Ki (2014), who evaluated the effect of a wiki-based collaborative writing pedagogy on writing abilities and attitudes in a primary classroom in China, and found that, despite pupils' positive attitudes toward wikis, they did not positively affect pupils' writing achievements. Li, Chu and Ki (2014) highlight some contextual factors contributing to the results, including limited practice time and issues relating to the affordability of wikis, as well as school facilities.

Similar to Li, Chu and Ki's (2014) findings, in this study, limitations on pupils' practice time and affordability of the wiki are also two possible reasons why pupils' collaborative writing activity using a wiki did not affect their writing achievements. According to the qualitative findings, pupils seem to have been given little time to practise writing with the wiki during the collaborative classroom activities. During eight weeks of intervention, pupils spent only four weeks writing collaboratively using the wiki and this had prevented them from obtaining the maximum benefits offered by wiki. This was because the computer laboratory where teachers carried out collaborative writing did not always seem affordable. For example, teachers from the experimental group said that it was difficult to book a computer laboratory, making it impossible to carry out collaborative writing with the wiki for a certain time. Moreover, interviews with pupils showed that poor internet access and computer applications contributed to their limited time to practise writing in classrooms, particularly when using wiki to facilitate their collaborative writing activities. In the interviews, both teachers and pupils stated that poor Internet connection affected the pupils' collaborative writing activities online on the wiki space, such as long web-loading period. Accordingly pupils spent a considerable amount of time only for waiting wiki web system to process their text input.

7.4. Summary

In this chapter, the findings from the qualitative and quantitative data analysis have been discussed, drawing on key concepts of sociocultural theory in language learning and technology integration. Key findings relating to teachers' and pupils' perceptions of EFL collaborative writing have been examined, including group work as a collaborative writing activity, the perceived benefits of EFL collaborative writing, group arrangements and their effect on pupils' learning activities, and issues in the practice of EFL collaborative writing in classrooms in Indonesia, including interpersonal conflicts, an insecure learning environment, concentration problems and disruptive behaviour. Two key findings relating to teachers' and pupils' perceptions of the two types of technology have also been discussed, such as the benefits of technology use in EFL collaborative writing, as well as contextual factors. The effects of technology in EFL collaborative writing on pupils' writing achievements have also been discussed.

This chapter has highlighted that group arrangements influence learners' learning activities in groups. The findings suggest that a mixed language ability arrangement is beneficial for pupils' learning because it promotes knowledge sharing and supports pupils' learning. The study identifies several issues regarding the practice of EFL collaborative writing: interpersonal conflicts, an insecure learning environment, concentration problems and disruptive behaviour.

In addition, the chapter has discussed the benefits to teachers' classroom instruction of using technology in EFL collaborative writing, including helping teachers prepare instructional materials with multimedia support, creating an enjoyable learning environment, promoting pupils' learning motivation, providing model texts for their pupils and helping them to assign homework to their pupils. With regard to wikis, both teachers and pupils perceived that working with a wiki in collaborative activities facilitated knowledge sharing and increased pupils' learning motivation. However, the study has found that contextual factors, such as computer application malfunctions and slow internet connections, have been factors that prevented the success of EFL collaborative writing using wikis. The study thus suggests the need for improvement of technology facilities in schools.

Finally, the chapter has discussed that integration of technology did not affect pupils' writing achievements, and that pupils who used wikis during collaborative writing activities did not perform better than those who used internet resources and online dictionaries. Two possible explanations for the positive but insignificant effect of technology use in EFL collaborative writing on pupils' writing achievements have been suggested, including limited practice time and the affordability of wikis for collaborative writing.

Chapter 8 Conclusion

This chapter presents conclusions from the study in three sections. Section 8.1 presents a summary of the findings. Section 8.2 explains the study's contributions to current theory, methodology, policy, and English as a foreign language (EFL) pedagogy. Section 8.3 presents the limitations of the study, and makes recommendations for further research.

8.1. Summary of findings

This study sought to investigate six research questions regarding the perceptions of Indonesian junior secondary school teachers and pupils of EFL collaborative writing and the use of technology to support this activity, differences between teachers' and pupils' perceptions, and the effect of two types of technology integration on pupils' writing achievements. A mixed methods approach with quasi-experimental design was employed to address these questions. Qualitative data were gathered using interviews with teachers and focus group interviews with pupils before and after an intervention. These data were analysed using thematic analysis. Quantitative data were gathered from timed writing tests administered before, immediately after and later after the intervention, and statistical analysis was carried out using non-parametric tests to analyse these quantitative data.

RQ1 What are Indonesian junior secondary school teachers' perceptions of EFL collaborative writing activities?

The study found that Indonesian junior secondary school teachers perceived the practice of EFL collaborative writing positively. The teachers discussed their positive perceptions with respect to their understanding of collaborative activities, the perceived benefits of collaborative writing in EFL classrooms, and classroom management. It is important to note here that the term "collaborative activity" was unfamiliar to Indonesian EFL teachers; they associated the term with group work. Collaborative writing activity was found to benefit pupils' learning in that it facilitated knowledge sharing, promoted positive affective effects and it contributed to the development of pupils' social skill. Teachers' selection of collaborative tasks and their grouping method were also found to facilitate pupils' interaction during group work and more importantly, help pupils maintain their focus

on meaning and language forms for writing. Moreover, although some pupils expressed their disagreement of teachers' use of their authority to make mixed language ability group arrangement, the present study found that such an arrangement positively influenced their learning activity. The arrangement of mixed language ability promoted knowledge sharing and scaffolded pupils' learning, especially the pupils with a low level of language proficiency. Unfortunately, there is no clear evidence in the present study the benefits of mixed language ability for pupils with higher level of language proficiency. Some issues in the practice of collaborative writing activity were highlighted by the teachers such as timing issue, peer feedback quality, an insecure learning environment, disruptive behaviour and pupils' preference to work individually.

RQ2 What are Indonesian junior secondary school teachers' perceptions of technology use in EFL collaborative writing activities?

The study found that Indonesian junior secondary school teachers' perceptions of the use of technology were positive. According to the teachers, use of technology benefited classroom instruction in that it helped teachers prepare instructional materials with multimedia support, created an enjoyable learning environment, promoted motivation for learning, provided model texts for pupils, and helped teachers to assign homework to their pupils. Specifically in relation to collaborative writing, use of technology facilitated pupils' learning of spelling, wording and sentence structure, and consequently with the development of a descriptive text. Use of technology also influenced pupils' affect, in that it created an enjoyable learning environment and, at the same time, promoted motivation for learning. However, a lack of technology facilities and their poor condition were two important issues preventing the effective use of technology in EFL collaborative writing.

RQ3 What are Indonesian junior secondary school pupils' perceptions of EFL collaborative writing activities?

The findings from the qualitative data analysis showed that pupils had positive perceptions of collaborative writing. They perceived that working collectively with peers in a group provides them with opportunities to learn from each other, facilitated motivation for learning, helped develop their ability to work with others in the group and, more

importantly, shaped their ability to communicate ideas. The pupils also agreed with their teachers that mixed language-ability arrangements are beneficial to their learning, although a few pupils said that they did not feel comfortable with group partners assigned by their teachers. With regard to group work activities, the pupils employed two strategies – division and non-division of work – which they thought were effective in achieving a shared goal in group work. Some issues regarding the practice of collaborative writing activities in EFL classrooms were highlighted by the pupils, including time management, interpersonal conflict and disruptive behaviour.

RQ4 What are Indonesian junior secondary school pupils' perceptions of technology use in EFL collaborative writing activities?

The findings from the qualitative data analysis showed that pupils perceived the use of technology in EFL collaborative writing positively. According to the pupils, technology facilitated their learning and helped create an enjoyable learning environment in classrooms. The findings also showed that pupils seemed to be already familiar with the use of online resources in EFL classrooms, such as online dictionaries, Google Translate, the Google search engine and Wikipedia. The wiki was a new tool which the pupils found easy to use and motivating. The pupils also claimed that their writing ability improved after attending the collaborative writing activity using the wiki, particularly in the aspects of spelling, vocabulary and grammar. Despite this positive perception, the pupils were concerned about two technical issues when using technology in collaborative writing: computer errors and slow internet connections. These technical issues reportedly prevented pupils from using technology effectively in collaborative writing activities.

RQ5 Is there any difference between teachers' and pupils' perceptions of EFL collaborative writing and of technology use in EFL collaborative writing?

In order to answer this research question, the study compared two qualitative data analyses: interviews with teachers and focus group interviews with pupils. The findings showed that teachers' and pupils' perceptions of collaborative writing were similar, particularly with regard to group work, the benefits of collaborative writing and method of group arrangements. Similar perceptions were also found in discussion of technology use in

EFL classrooms, especially with regard to the benefits of technology use in collaborative writing and some contextual factors. This finding indicated that teachers' participation in the present study did not seem to change their daily instructional method. More importantly, technological training provided in the present study did not make teachers more able to operate technology to facilitate collaborative writing activities.

RQ6 Do two types of technology integration, e-collaborative CALL and e-resources CALL, in an EFL collaborative writing activity affect pupils' writing achievements?

One of the major findings to emerge from this study was that the use of technology in EFL collaborative writing had positive effects on pupils' writing achievement. Pupils from all research groups achieved better in the post-tests, although their writing achievements were lower in the delayed post-tests. In the post-tests, the findings show that pupils who used e-collaborative CALL improved in all aspects of their writing, including vocabulary, syntax, generic structure and communicative purpose. In the active control group, where pupils used e-resources CALL, improvements occurred in vocabulary, cohesion and generic structure. In the passive control group, some aspects of pupils' writing, including vocabulary, syntax, cohesion and communicative purpose, were reported to have improved.

The second major finding is that, despite positive perceptions of the use of technology in collaborative writing, it did not significantly affect pupils' writing achievements. The findings showed that pupils who used e-collaborative CALL and those who used e-resources CALL in EFL collaborative writing did not perform better than those who carried out the task with no technology. In addition, pupils' achievements were statistically similar between the e-collaborative CALL and e-resources CALL groups, indicating that the use of e-collaborative CALL and e-resources CALL had similar effects on pupils' writing achievements.

8.2. Implications of the findings

This section examines the implications of this study for the current literature, methodology, policy and foreign language teaching pedagogy.

8.2.1 Implications for the current literature

The findings of this study contribute to the current literature on effective use of technology in collaborative writing classrooms. Their contribution lies primarily in the extent to which the wiki was employed to facilitate pupils' collaborative writing activities in upper primary schools in Indonesia. In this Indonesian context, pupils were learning English as a foreign language (EFL). There have been a few previous studies of wikis in the EFL context, particularly in Asia, but these have been dominated by studies in China (e.g. Li et al., 2014; Mak & Coniam, 2008; Woo et al., 2011), Saudi Arabia (e.g. Alshalan, 2010; Alshumaimeri, 2011), and Taiwan (e.g. Chao & Lo, 2009; Chen, 2008; Huang, 2012; Lee & Wang, 2013; Wang, 2014). More importantly, many of these studies were conducted with university learners (see Storch, 2013), and studies of wikis in the context of upper primary schools have been rare. In Indonesia, the use of wikis is considered new, and the practice of wikis in upper primary schools is still in its infancy. Although the findings of this study did not show a significant effect of wikis on pupils' writing achievements, the teachers and pupils perceived the use of wikis in collaborative writing classrooms positively. As presented in Chapter 5, the wiki was perceived to facilitate knowledge sharing and increase pupils' motivation for learning. The wiki was also claimed to enhance pupils' writing ability, particularly in the aspects of spelling, wording and grammar.

8.2.2 Implications for policy

The findings of this study have implications for policy makers. First, as mentioned in Chapter 2, the Indonesian government has given ICT grants worth a total of 4,179 USD per school to help them provide ICT facilities (see Belawati, 2003). As a result, about 95 per cent of public junior secondary schools possess one or more computer laboratories, each comprising 28 to 40 personal computers (PCs) (Sumintono et al., 2012). Unfortunately, the condition of these facilities in schools seems still poor. The findings of this study showed that technical issues relating to the poor condition of technology facilities prevent both teachers and pupils from using the technology effectively in collaborative writing. These findings also indicated that technology facilities in schools are not adequately maintained by the school administration. Therefore, in addition to providing schools with ICT grants to help them provide technology facilities, the government should also ensure that school administrations maintain their

technology facilities properly. According to Lim (2007), an adequate number of reliable ICT tools in the school learning environment will help teachers achieve success in the use of technology in classroom instruction.

In addition, the findings of this study have implications for policy makers in the Ministry of Education and Culture (MOEC). As presented in Chapter 5, the study has found that the teachers' colleagues played an important role in promoting effective use of technology in collaborative writing activities. For example, the teachers mentioned that they had received assistance from colleagues in solving technical issues when using technology in collaborative writing activities. More importantly, their colleagues had also shared their knowledge and taught them how to use the technology for classroom instruction, which had increased their confidence in using it. These findings thus provided evidence supporting the MOEC's current policy regarding the role of ICT teachers in classroom instruction. It is important to note that the MOEC's current policy has shifted the role of ICT teachers in schools from teaching ICT to pupils to facilitating teachers' use of technology for classroom instruction and evaluation (Kemdikbud, 2014a). The MOEC (2013) has explained the role of ICT teachers in classrooms, which includes giving technical guidance and mentorship to teachers, pupils and school staff members on the use of ICT. Given that number of ICT teachers is still few in Indonesian school classrooms (Heppy et al., 2011), the government through MOEC should consider to either search for new candidates of ICT teachers or train subject teachers in schools about ICT.

8.2.3 Implications for foreign language (FL) teaching pedagogy

Collaborative writing activities in EFL classrooms

One of the most important implications of this study is its extension of Vygotsky's sociocultural theory (SCT) to the Indonesian context. Vygotsky's SCT has informed Indonesian EFL teaching that development of learners' knowledge is influenced by their social interactions with other learners, and that pupils' interactions in a collaborative learning environment facilitate knowledge sharing and learning support. However, although the findings of the present study showed that both Indonesian EFL teachers and pupils benefited from collaborative activities in writing classrooms, the extent of their effectiveness remained unknown and thus requires further investigation.

Peer feedback as a pedagogical tool in the classroom

The findings of the study highlighted that, in group work, pupils learned how to write English from feedback given by their peers, in particular with regard to spelling, vocabulary and grammar. As shown in the qualitative data analysis, pupils' feedback encouraged communication and discussion. This finding suggested that peer feedback in collaborative writing may have a positive influence on pupils' learning about writing. Teachers therefore should view peer feedback as a learning resource and use it as a pedagogical tool in writing classrooms.

Given that peer feedback is a beneficial alternative in the practice of teaching and learning English in classrooms, teachers need to update their knowledge of its benefits and how to implement it in writing classrooms. It is also important for teachers to teach and train their pupils on how to correct spelling and grammatical aspects of writing. Pupils' ability to indicate and correct errors in peers' writing will increase the credibility of the feedback.

Training for teachers

The findings from the interviews with teachers showed that teachers' perceptions of collaborative writing and the use of technology in collaborative writing remained largely unchanged, particularly in providing feedback and monitoring pupils' writing activities. When using the wiki, for example, rather than using editing features, the teachers provided feedback manually by pointing out grammatical error using their fingers. This indicated that the training on and use of technology in collaborative writing conducted prior to the study was insufficient to change teachers' daily teaching practices. Therefore, teachers need more training on how to carry out collaborative writing effectively. They also need more training on how to use e-collaborative CALL applications such as wikis.

8.2.4 Implications for methodology

The methodological implication of the study relate to the pre-, post- and delayed post-test design. As discussed in Chapter 4, a few previous studies have compared two timed writing tests to evaluate the effective use of technology in collaborative writing activities on pupils' writing achievements at the beginning and end of an intervention. However, this method does not seem to have produced sufficient evidence to determine whether the use of technology has long-term effects on pupils' writing achievements. The use of a delayed post-test in this study clearly ascertained the effect of the intervention on writing achievements two months after the intervention.

The second implication for methodology relates to the experimental groups. Most research on the use of wiki as a collaborative tool involve either one group or two groups to examine the effect of wiki on learners' writing achievement (e.g. Li, Chu, & Ki, 2014; Mak & Coniam, 2008; Wang, 2014; Woo, Chu, Ho, & Li, 2011). These study did not control potential effect of learners' internet as learning resources on learners' writing achievement. In fact, several studies (e.g. Hegelheimer, 2006; Yeh et al., 2007) have shown that the access to e-resources may alone influence learners' writing performance. In this study, to obtain clear picture of the effect of wiki on pupils' writing achievement, pupils' activities in an e-resources CALL was controlled, and their writing achievements before and after the intervention were examined.

8.3. Limitations and recommendations

This study has several limitations relating to sampling, limited time for the intervention, methodology and generalisability. The first limitation is connected with the sampling. The schools in this study were selected using purposive sampling on the basis of three criteria: instructional approach, English teacher qualifications and availability of school facilities. In addition, due to the actual situation in the selected schools, the teacher participants in this study were all female. Accordingly, the findings of this study were limited in the sense that information was not obtained on male teachers' perceptions of the activities; therefore,

they do not represent an overall view of teachers of EFL in general. Future research in the same field should therefore consider the sampling method and address the gender issue.

Secondly, there was limited time for the intervention. It has been discussed in Chapter 4 that the intervention in this study was scheduled to last for eight weeks, giving the pupils enough time to practise writing in a wiki-mediated collaborative environment. However, due to technical issues in the schools, the pupils spent only four weeks writing collaboratively using the wiki and this has limited pupils' opportunities to practice writing through a joint task in wiki. In addition, the pupil participants in this study were junior secondary school freshmen, and this was their first experience of collaborative writing using technology. Therefore, they should have been given more time to adapt to using technology in collaborative writing and, more importantly, to practise the collaborative writing activity using the wiki.

Thirdly, this study has methodological limitations. As presented in Chapter 6, pupils' writing abilities before the intervention were not equal across participating groups. The quantitative analysis showed that pupils' writing scores for each participating group were significantly different in the pre-test, specifically in the aspects of vocabulary, cohesion and generic structure. Aside from this finding, it was observed that pupils in the experiment and active control groups were comparable in their writing achievements, except in the aspect of cohesion. While the present study did not control over teaching input from all research groups at the post intervention stage, there was no evident if teachers still maintained to carry out collaborative writing activities and to incorporate technology in the activity. Such an absence of control over teachers' instructional activities at the post-intervention may imply on the pupils' writing achievement at the delayed post-test. As presented earlier in Chapter 6, the quantitative findings showed that the writing achievements of pupils in all research groups declined in the delayed post-test. Future studies addressing similar issues should thus consider to maintain similar participant backgrounds before an intervention, particularly in their level of language ability. More importantly, future studies should employ an observation check between the post-test and delayed post-test to ensure that all teachers are still practising collaborative writing activities, particularly with technological support.

The fourth limitation of this study lies in the generalisability of the findings. In the Indonesian context, the latest data from the MOEC in 2014 show that Indonesia has 35,488 junior secondary schools (both public and private schools) with 9,715,203 pupils (Kemdikbud, 2014b). The educational statistics indicate that a total of 3,268,383 pupils attend grade seven classrooms across the country. This study only involved six junior secondary schools, six teachers and 192 grade seven pupils in Jakarta. Given the small sample of participants and small quantity of data gathered from interviews, focus group interviews and writing tests, the findings of this study thus may not be generalizable to English language teachers and pupils across the country.

Appendix 1 Teacher interviews

The following questions were asked in pre- and post-interview with teachers:

Section 1

Interview objective: to explore teachers' perceptions about collaborative writing activity

Participants: Teachers from all research groups

Questions:

1) What do you understand about collaborative learning activity?
   a. How do you define collaborative learning activity?
   b. What do you think of benefits from collaborative learning activity in EFL classrooms?
2) How do you manage the classrooms in order to facilitate collaborative writing?
   a. How do you arrange the pupils to work in group?
   b. In what learning of writing stages do you carry out collaborative writing activity?
   c. Do you monitor your pupils' collaborative writing activity? If yes, how do you do it?
   d. Do you give feedback on pupils' writing? If yes, how do you do it?
3) What issues (challenges) do you encounter when incorporating collaborative activity in EFL writing classroom?

Section 2

Interview objective: to explore teachers' perceptions about the use of technology in EFL collaborative writing activity

Participants: Teachers from experiment and active control groups

Pre-interview	Post-interview
4) How do you perceive about the use of technology in EFL teaching? a. What technology do you use in classroom instruction? b. What benefits do you get when incorporating technology in classrooms? c. Do you receive any support from your school when incorporating technology? If yes, what support do you receive?	4) How do you perceive about the use e-collaborative CALL/ e-resources CALL in EFL collaborative writing activity? a. What benefits do you get when incorporating e-collaborative CALL/ e-resources CALL technology in EFL collaborative writing activity? b. Do you receive any support from your school when using e-collaborative CALL/ e-resources CALL? If yes, what support do you receive?
5) Do you encounter any issues when incorporating technology in classroom instruction? If yes, what are they?	5) Do you encounter any issues when incorporating technology in classroom instruction? If yes, what are they?

Appendix 2 Focus group interviews

The following questions were asked in pre- and post-focus group interview with pupils:

Section 1

Interview objective: to explore pupils' perceptions about collaborative writing activity

Participants: Pupils from all research groups

Questions:

1) What do you think of group work activity?
   a. Do you find any benefits from working together with your peers in a group work? If yes, what are they?
   b. How do you arrange a group? Do you choose your own partners in group? If yes, how do you choose them? If not, who arrange the group?
2) How do you and your peers working in group complete the task? What strategy do you use?
3) Do you find any problems (issues) when working with other peers in a group work? If yes, what are they?

Section 2

Interview objective: to explore pupils' perceptions about technology use in EFL collaborative writing activity

Participants: Pupils from experiment and active control groups

Questions:

Pre-interview	Post-interview
1) How do you perceive the use of technology in EFL learning? a. Do you use technology for learning English? If yes, what technology do you use and why do you use them?	1) How do you perceive the use of e-collaborative CALL/ e-resources CALL technology in EFL collaborative writing activity?
2) What benefits can you get from using technology in learning English?	2) What benefits can you get from using e-collaborative CALL/ e-resources CALL in EFL collaborative writing activity?
3) Do you find any problems when using technology in learning English?	6) Do you find any problems when using e-collaborative CALL/ e-resources CALL in EFL collaborative writing activity?

Appendix 3 Pre-writing test

Writing test: Pre-Test

Instruction:

From the picture below, write a paragraph of descriptive text. You need to pay attention to:
1. The use of article such as a, an, and the
2. The use of action verbs and adjectives in describing the objects
3. The use of present tense in your sentence

Picture

Source: http://www.marketingweek.co.uk/news/lazytown-to-launch-healthy-kids-drinks/4000742.article

Appendix 4 Post- and delayed post-writing test

Writing test: Post- and delayed post tests

Instruction:

From the picture below, write a paragraph of descriptive text. You need to pay attention to:

1. The use of article such as a, an, and the
2. The use of action verbs and adjectives in describing the objects
3. The use of present tense in your sentence

Picture

Source: http://eng1d6.wikispaces.com/Media+texts

Appendix 5 Answer sheets and teacher's scoring rubric

Answer Sheet

Name : ……

Class : ……

Remember :

1. Use articles such as a, an, and the in your writing
2. Use action verbs and adjectives in describing the objects
3. Use present tense in your sentences

Teachers' rubric:

Grammatical Knowledge		Textual Knowledge		Functional knowledge	Total Score
Vocabulary	Syntax	Cohesion	Generic Structure	Communicative purpose	

Appendix 6 Information sheet and informed consent forms (English translation)

Information Sheet for Parents/Carer

Technology enhanced collaborative writing

Dear parents,
We would like to invite your child to participate in a research study. Before you decide, you need to understand the reasons for conducting the study and how it involves your child. Please take some time to read the following information about this study.

What is the purpose of this study?
The purpose of this study is to find out pupils' attitudes towards technology in writing activity, their attitude change as well as their writing achievement before and after participating in the collaborative writing activity assisted by computer technology.

Why has my child been invited?
There is little research on Year 7-class pupils' writing and their attitudes towards the writing activity assisted by computer technology in Indonesia. Since your child is in Year 7 class, his/her participation in this study will greatly contribute to the knowledge of how year 7 children perform in writing using technology. The principle of your child's school has agreed, together with your child's English teacher, to participate in this study too.

What will happen in the study?
There will be three schools in this study, and your child's school will be randomly assigned to either group 1, group 2, or group 3. You will be informed which group that your child's school is in.
Group 1: Children in group 1 will receive 7 weeks collaborative writing activity where your child will work with other pupils to develop a text. This activity will last from July to October 2013 with 80 minutes for each week. In each writing session, computer technology will be used as collaborative tool to facilitate your child and other pupils to develop their joint-text writing.
Group 2: Children in group 2 will receive the same activity but different use of computer technology. In this group, computer technology will be used as learning resources in order to facilitate your child and other pupils to develop their joint-text writing.
Group 3: Children in group 3 will receive the same activity as in group 1 and 2, yet will not be assisted by computer technology during the collaborative writing activity.

Who will administer the writing instruction?

In the classroom, the instruction will be carried out by your child's English teacher. This will be integrated in daily teaching and learning activity at your child's school.

How will my child be assessed?

The study will start in early July 2013 before the writing instruction begins. We will first interview pupils about technology and their writing. The interview will involve a 60 minute discussion with a group of six children, and the discussion will be video recorded so that we could later easily remember the discussion and analyse it. Later the pupils will be asked to do a paper-based writing task for about 60 minutes. Your child's English teacher and one other researcher from a different school will score the writing assessment. The identity of your child will be kept in strict confidence from the other teacher scoring your child's writing. The same assessment will also be carried out after the instruction finished in October 2013. This will help us to evaluate the progress we hope will make as a result of the writing instruction.

Will my child be given an opportunity to comment on the researcher's written report on the focus group discussion?

You child will not able to access the researcher's written comment on the focus group discussion and comment on it. Your child's teachers will also not be able to comment on the researcher's written report on the focus group discussions, as this report will be kept in strict confidence. Only the data related to pupils' writing achievement will be disclosed to the teachers in order to inform them about their pupils' progress.

Will my child's information be kept confidential?

We would like to assure you that all information and data collected in this study will be kept firmly confidential and will be available only to the researcher. All data related to your child will be kept in a cabinet and locked. Your child's name will not be identified in any reports or publication.

Does my child have to participate?

No, you are free to withdraw your child from the study, or your child may decide not to continue with the study, at any time. If you decide to withdraw your child from the study please tell your child's teacher. There will not be any consequences for withdrawing your child from the study.

What to do next if you are happy to have your child participate in the study?

If you are happy to have your child participate in this study, you are kindly asked to complete and sign the consent form attached to this information sheet. After signing the consent, please return it to your child's English teacher as soon as possible.

What do I do if I have a concern?

If you have any concerns about your child participating in this study, please contact us and we will discuss it directly.

If you need more information or any further questions about the study, please contact the researcher using the following details below:

Herri Mulyono

Tel. 085780811576, email: hm790@york.ac.uk

Parent/Carer Consent From (Opt in Form)

Technology enhanced collaborative writing

If you permit your child to participate in this study, please thick the box ☑ and return it to your child's English teacher within one week of receiving this form.

I agree my child to participate in this research study ☐

Date	Name (Parent/ Carer)	Signature (Parent/ Carer)

Date	Name (Researcher)	Signature (Researcher)

Information Sheet for Teachers

Technology enhanced collaborative writing

Dear teachers,
We would like to invite your participation in this study. Before you make decision, you need to understand the reasons of conducting the study and how it involves your participation. Please take some time to read the following information about this study.

What is the purpose of this study?
The purpose of this study is to find out pupils' attitude towards technology in writing activity, their attitude change as well as their writing achievement before and after participating in the writing activity assisted by computer technology.

Do I and the children have to participate?
We plan to assess your attitude, your pupils' attitude towards technology and your pupils' writing achievement after and before the intervention given. The principle of your school has decided to participate in this study. However, your participation and your pupils' participation are voluntary.

What is the writing instruction program about?
There will be three schools in this study, and your school will be randomly assigned to either group 1, group 2, or group 3. You will be informed which group that your school is in.
Group 1: Children in group 1 will receive 7 weeks collaborative writing activity where your pupils will work in group to develop a text. This activity will last from July to October 2013 with 80 minutes for each week. In each writing session, you are asked to use computer technology as collaborative tool to facilitate your pupils to develop their joint-text.
Group 2: Children in group 2 will receive the same activity but different use of computer technology. In this group, you are asked to use computer technology as learning resources in order to facilitate your pupils to develop their joint-text.
Group 3: Children in group 3 will receive the same activity as in group 1 and 2. However, you will not use computer technology during the collaborative writing activity.

Who will administer the writing instruction?
In the classroom, you will deliver the writing instruction. This writing instruction will be integrated with your daily teaching and learning activity.

How will I and my pupils be assessed?

The study will start in early July 2013 before the instruction begins. We will first interview you and your pupils about technology and their writing. This interview will last for about 60

minutes and will be audio recorded that we could later easily remember the interview and analyse it. Later, your pupils will be asked to do a paper-based writing task for about 60 minutes. You and other colleague from different school will score the writing assessment. Your identity and also your pupils' identity will be kept in strict confidence from the other teacher scoring your pupils' writing. Your identity in the interview will be kept confidential as well and will be only available for the researcher. The same assessment will also be carried out after the instruction finished in October 2013. This will help us to evaluate the progress we hope will make as a result of the writing instruction.

Will I and my pupils be given an opportunity to comment on the researcher's written report on the focus group discussion?

You and your pupils will not be able to access the researcher's written comment on the focus group discussion and comment on it. Only the data related to your pupils' writing achievement will be disclosed to you in order to inform them about their pupils' progress.

Will my information be kept confidential?

We would like to assure you that all information and data collected in this study will be kept firmly confidential and will be available only to the researcher. All your data will be kept in a cabinet and locked. Your name will not be identified in any reports or publication.

What do I do to participate in the study?

If you are happy to participate in this study, you are requested to attend our training session to prepare you in carrying out the writing instruction later. Then, you are kindly asked to complete and sign the consent form attached to this information sheet. Please return it to the researcher. We also ask that you send an information sheet to parents so that they can make decision whether or not they would like their child to participate.

What to do next if there is a problem?

If you have any concerns about your participation as well as your pupils' participation in this study, please contact us and we will discuss it directly.

If you need more information or any further questions about the study, please contact the researcher using the following details below:

Herri Mulyono

Tel. 085780811576, email: hm790@york.ac.uk

Teacher Consent From (Opt in Form)

Technology enhanced collaborative writing

If you agree to participate in this study, please thick the box and return it to the researcher.

I have read and understand the information given. I agree to participate in this study ☐

Date	Name (English teacher)	Signature (English teacher)

Date	Name (Researcher)	Signature (Researcher)

The Principal Consent From (Opt in Form)

Technology enhanced collaborative writing

I, _____ [Head teacher name] consent to _____ [school name] participating in the study: technology enhanced collaborative writing.

I have had the opportunity to discuss the study with the researcher and understand that as part of this research will be:

1. Classroom intervention during the collaborative writing activity
2. Interviews with English teacher and their pupils before and after the intervention
3. Writing assessment of pupils before and after the intervention

I am assured that:

1. The name of school will be kept unknown and will not be identified in any publication or publicity surrounding the research without my consent.
2. All data from individuals will be stored in line with Data Protection legislation and all personal or identifying details will be kept confidential.
3. Parents will have the right to withdraw their children from the study at any time and if they do so they should contact the research team as soon as possible prior to assessments taking place. If this occurs after the assessments have been conducted I will still inform the research team and they will remove the child's data from their records.
4. I have the right to withdraw my consent at any time

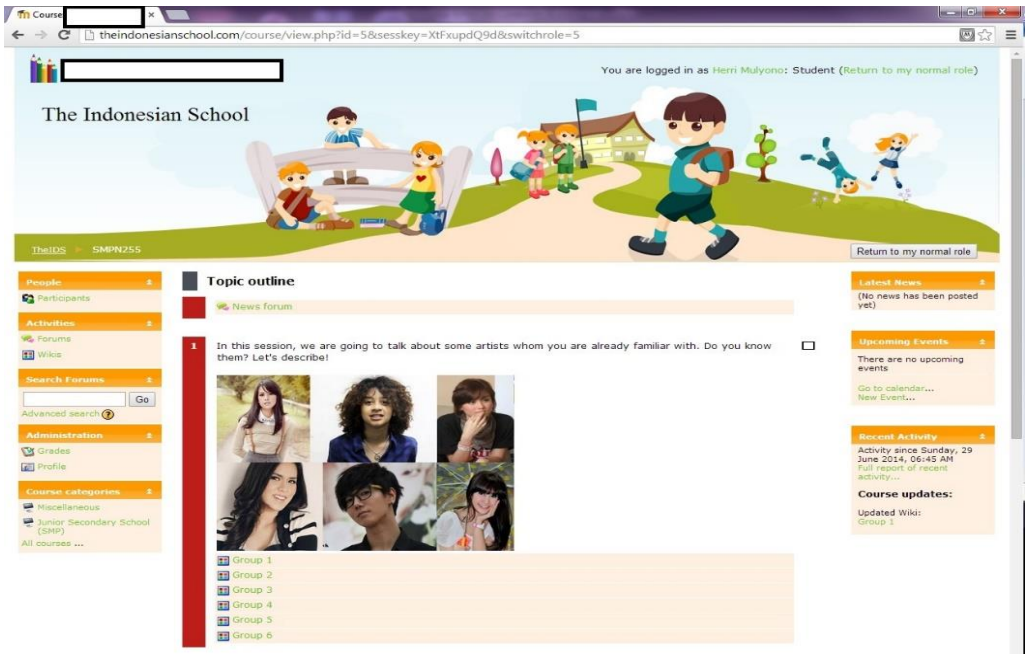
Signed :_____

Date :_____

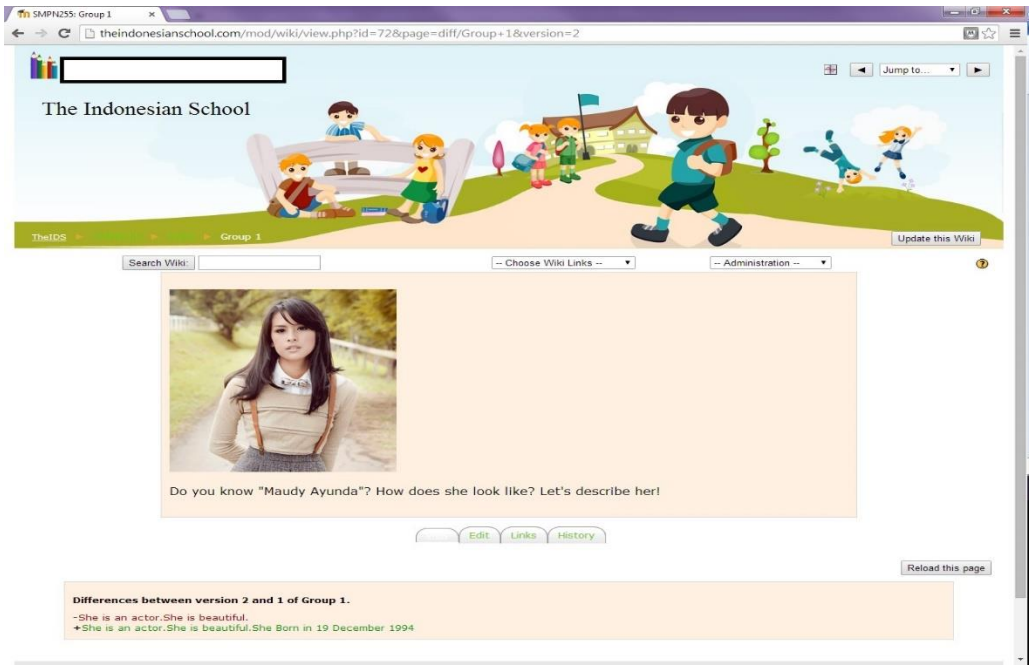
If you have any further questions please do not hesitate to contact the researcher: Herri Mulyono, Tel: 085780811576, email: hm790@york.ac.uk

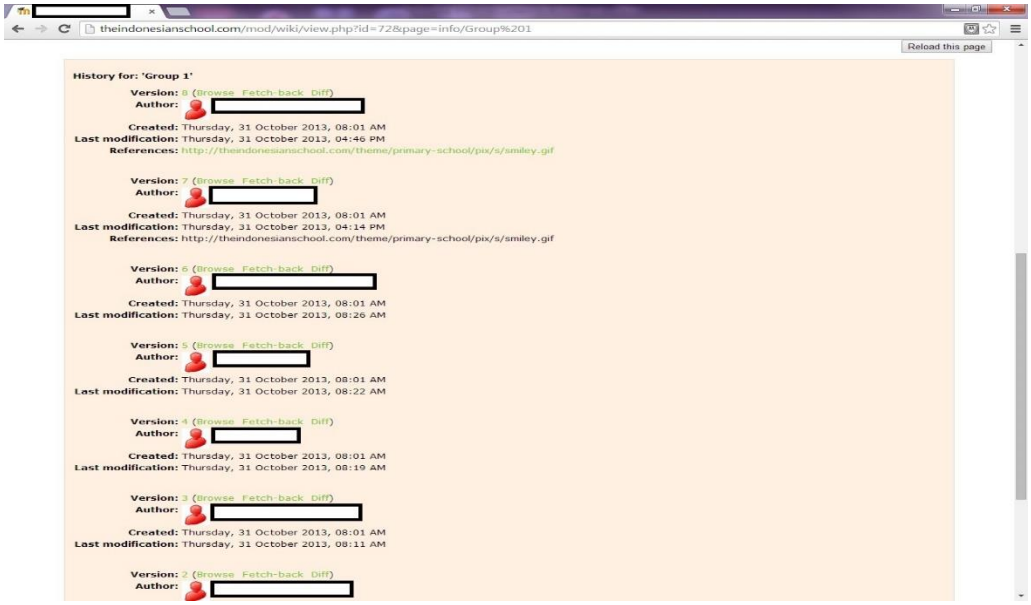
Appendix 7 Samples of pupils' writing activity in WIKI

1. Screenshot of WIKI webpage



2. Samples of history of pupils' writing activity





3. Samples of pupils' writing (no changes has been made on pupils writing)

Group 1, School A

Sule is comedian.Sule is artist.He full name is Entis Sutrisna.He works at Trans7. He is Opera Van Java's comedian.He has a long hair. He is very funny.

He could make people laugh when he heard talk.

He Comes from West Java.He has 4 friends. They name are Andre, Nunung, Parto, Aziz. They have a many fans.He has brown hair.He lives at Jakarta.He can speak Javanese languange.He was born at 15th November 1976. He has 4 children. he has 2 son and 2 daughters. Thy name are Rizky Febrian,Adriansyach Sutisna, Putry Delina Andriyani Sutisna, Rizwan Adriansyach Sutisna, Ferdinan Ardiansyach Sutisna.

Group 4, School A

Syahrini is a singer. She is a beautiful girl.She has beautiful voice . she has a long hair. she was about thirty years. she has not been married. she has many fans. she is very famous. she has slim body.

Group 6, School B

Her name is Anisa Rahma. She is twenty three years old. She have smooth skin. She is a girlband Indonesia , but she was out of "Cherrybelle" . She was bormhas long hair. Her tall and slim body. Her has pointed nose. She is beautiful girl and she is have a cat. Her cat name is chucky.

Appendix 8 Teacher Observation Checklist

Teaching procedure checklist

Date of observation :

Teacher :

School :

No.	Teaching procedure/description	Checklist		
		Yes	No	Note
1	Stage 1; building knowledge			
	1. Teacher presents and leads a discussion related to descriptive text (e.g. through images, films etc)			
	2. Teacher stimulates pupils' shared knowledge and experience through questioning			
	3. Teacher exposes the descriptive text through sample of texts, questions, situation or context where descriptive text is used			
2	Stage 2; modelling			
	1. Teacher leads a discussion on following details: a. The field of descriptive text (e.g. social purpose and text organization) b. Tenor (or the participants of the event) c. Mode (or linguistic features to construct descriptive text)			
	2. Teacher provides some samples of descriptive text (from some resources e.g. poster, webpages, newspaper)			
	3. Teacher explains text organization			
	4. Teacher explains some linguistic features from descriptive text (and provides practical session of using these features)			
3	Stage 3; join construction of the text			

	1. Teacher sets pupils in group			
	2. Teacher distributes task for collaborative writing			
	3. Teacher leads the L2 collaborative writing activity			
	4. Teacher does monitoring and provides assistance			
	5. Teacher provides feedback			
4	Stage 4; independent construction of the text			
	1. Teacher distributes task for independent construction			
	2. Teacher does monitoring and provide assistance			
	3. Teacher provides feedback			
5	Stage 5; networking (communicating			
	1. Teacher provides opportunity for pupils to share what they have learned			
6	Scaffolding pupils' L2 writing			
	Teacher provides following activities to pupils:			
	1. Reconstructing writing			
	2. Text patterning			
	3. Independent composition			
7	Using technology to facilitate L2 collaborative writing*			
	1. Teacher informs the role of technology to the pupils			
	2. Teacher (assisted by school technician) provides technical detail of using technology			
	3. Teacher uses technology to assist instruction			
	4. Teacher uses technology to assist collaborative writing activity			
	5. Teacher provides online monitoring and assistance**			
	6. Teacher gives online feedback**			

*apply only to exp and act-con groups

**apply only to exp group

List of abbreviations

BAN	Badan akreditasi nasional (National accreditation body)
BAN S/M	Badan akreditasi nasional sekolah/madrasah (National accreditation body for schools and Islamic schools
BPS	Badan pusat statistic (Central bureau of statistic)
BSNP	Badan standar nasional pendidikan (National education standard body)
CALL	Computer assisted language learning
EFL	English as a foreign language
FL	Foreign language
ICT	Information and communication technology
Jardiknas	Jaringan pendidikan nasional (National education network)
L1	First language
L2	Second language
LPMP	Lembaga penjamin mutu pendidikan (National quality assurance body)
MOEC	Ministry of Education and Eulture
MTs	Madrasah tsanawiyah (Islamic junior secondary school)
SCT	Sociocultural theory
SFL	Systemic functional linguistics
SK	Standar kompetensi (Competency standard)
SLTP	Sekolah lanjutan tingkat pertama (Junior secondary school)
SMA	Sekolah menengah atas (Senior secondary school)
SMP	Sekolah menengah pertama (Junior secondary school)
SMPN	Sekolah menengah pertama negeri (Public junior secondary school)
SNP	Standar Nasional Pendidikan (National Education Standard)
SSN	Sekolah standar nasional (National standard school)
ZPD	Zone of proximal development

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