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Wiki-based Collaborative Writing Activities in ESL Contexts

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WIKI-BASED COLLABORATIVE WRITING ACTIVITIES IN ESL CONTEXTS

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DEDICATION

This dissertation is dedicated to the soul of my father—Abdullah Ali Alghammas—who greatly contributed to my intellectual and professional growth, my beloved mother who always insists on gaining knowledge though she is nearly illiterate, my loving wife who lessened all burdens I have faced during this research journey, and finally my adorable children—Abdullah, Abdurrahman, and Joharah—for being my greatest inspiration.

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ABSTRACT

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Driven by Vygotsky's sociocultural theory and the notion of the zone of proximal development (ZPD), and Long's interaction hypothesis, the study investigated how intermediate-level international ESL students at an urban U.S. Mid-South university interacted in wiki-based collaborative writing. Students' perspectives toward the integration of wikis in writing assignments and why they hold such perspectives were also objectives of the study. Eighteen students in small groups of three were asked to collaboratively write three different paragraphs, namely, summary, compare/contrast, and classification.

Using a triangulation mixed-methods approach, the data were collected over 8 weeks. Pre- and post-survey questionnaires were administered using an online survey website to get the students' opinions. A password-protected class wiki was set up to help students collaborate on the writing prompts. Because not all participants had used wikis before, the researcher gave a training session and asked students to do a mock writing activity. For simplicity and a friendly-user interface, PBworks.com was chosen from several free wiki sites. Following the course syllabus design, the writing instructor chose the writing prompts and asked the researcher to post them online in a timely manner.

Key findings of the study revealed that the majority of students hold positive attitudes toward wiki-based collaborative writing although it was the first time for *all* the students to work on wikis. The reasons behind students' positive attitudes included, but are not limited to, the fact that students helped and scaffolded one another to develop one

well-written product and the opportunity to collaborate anytime and anywhere on the class wiki. Another interesting finding indicated that students' attention to form (i.e., grammatical surface structure) and meaning (i.e., content) is affected by the writing task. The study's results accord with previous studies. The study concluded with several suggestions for future research studies.

TABLE OF CONTENTS

Chapter		Page
1	Introduction	1
	Statement of the Problem	2
	Purpose of the Study	4
	Research Questions	4
	Significance of the Study	5
	Limitations and Delimitations of the Study	6
	Definition of Terms	7
	Organization of the Study	8
2	Literature Review	9
	CMC and Collaborative Writing	9
	Overview of Wikis	12
	Features of Wikis	14
	Wikis in Language Education	16
	Wiki-Related Studies	23
	Wikis in Composition Courses	30
	Need to Study	32
3	Research Methodology	34
	Research Design	34
	Participants	35
	Pilot Study	37
	Class Wiki	38
	Wiki Writing Tasks	40
	Researcher's Role	41
	Data Collection Procedure	42
	Instruments	44
	Data Analysis Procedure	46
	Ethical Consideration	49
4	Results	51
	Quantitative Results	51
	Qualitative Results	58
	Open-Ended Responses	67
5	Discussion, Conclusion, Limitations, and Recommendations for Future Studies	70
	Discussion of Results	70
	Summary of the Study	78
	Pedagogic Implications	80
	Limitations of the Study	81
	Recommendations for Future Studies	82

References 84

Appendices

A. Information Sheet 93
B. IRB Approval 94
C. Permission to Adapt Questionnaire 96
D. Pre- and Post-Survey Questionnaires 97
E. Informed Consent Form 100
F. Participants' Objectives to Learn English 103
G. Participants' Experiences with Web 2.0 Applications 104
H. Participants' Responses to the Four Open-Ended Questions 105

LIST OF TABLES

Table	Page
1. Demographic Information	36
2. Coding Category for the Form-Related Changes Items with Descriptions. Adapted and Modified from Kessler (2009)	47
3. Coding Category for the Meaning-Related Changes Items with Descriptions. Adapted from Kessler and Bikowski (2010)	48
4. Overview of the Data Analysis	48
5. Presurvey Responses and Frequencies of Students' Background in Learning English and Computer Use	52
6. The Four Predetermined Categories Grouping	53
7. Attitudes Regarding Collaborative Writing	54
8. Wikis and Academic Writing	55
9. Wikis and Writing Tasks	55
10. Participation in Wiki-Based Writing Activities	55
11. Groups' Participation Frequency in Wiki-Based Writing Activities	59
12. Frequency of Type of Participation	59
13. Frequency of Effect of Tasks on Form-Related Changes (FRCs) and Meaning-Related Changes (MRCs)	59
14. Categories and Frequencies of Form-Related Changes (FRCs)	60
15. Categories and Frequencies of Meaning-Related Changes (MRCs)	60

LIST OF FIGURES

Figure	Page
1. A sample of a collaborative essay in the pilot study.	38
2. Private class wiki login page.	39
3. The class wiki and groups' pages.	40
4. Writing tasks.	41
5. Examples of FRC categories.	64
6. Examples of MRC categories.	66

Chapter 1

Introduction

From the onset of Internet technology, different computer-mediated communication (CMC) applications, whether synchronous or asynchronous, have been used in language learning and teaching. Advocates of computer-assisted language learning (CALL) assure the potential of CMC in academic writing courses, which are deemed challenging and tedious for language learners. Bloch (2007) and Rezaee and Oladi (2008) stated that using various CMC applications helps students to successfully transition from a colloquial writing style to a more academic writing style.

Compared to classroom writing activities, CMC tools provide enough time for students to review, revise, and double-check writing before publishing their writing. It has been shown that written interaction directs learners' attention toward linguistic features (Warschauer, 1997). Not only do CMC applications allow students ample time for editing and revising, but they also train students to consider writing as a process. The idea of teaching writing through a process, which began in the 1980s, accords with Perl (1994) who suggested that writing is a recursive process. Thus, it is crucial for writing instructors to find new ways in writing pedagogical practices. Group work or collaborative writing is an effective way to assist language teachers to shift from a product-oriented to a process-oriented teaching approach. The notion of collaborative writing and its effect on the writing process are strongly supported by both L1 and L2 scholars (Li, 2014).

Very significantly, collaborative writing represents the idea of Ede and Lunsford (1990), who posited that writing is a social process. Because writing is a social act, CMC

social networking applications have been a great asset in writing practices. Researchers such as Chapelle and Jamieson (2008) confirmed that by exposing language learners to a variety of CMC applications, language teachers encourage students to become collaborative learners inside and outside the classroom. Zeng and Takatsuka (2009) also claimed:

> Through collaborative dialogue, learners mutually scaffold each other to find how best to express their intended meaning by giving and receiving assistance as they interact with each other. In working towards the common task goal, learners become contributing members by pooling their knowledge and resources for joint decision making and problem solving. (p. 436)

CMC applications undoubtedly open new avenues for students to collaborate and share thoughts. For example, when students collectively write in a CMC space, they provide a real audience for each other's work, which is regarded as an advantage in writing assignments (Lundin, 2008).

Among several social networking applications, this study focuses on wikis as one of the prevalent social applications for several reasons. First and foremost, current studies in both L1 and L2 contexts confirm the effectiveness of wikis in collaborative writing; as Godwin-Jones (2003) stated, "Wikis are intensely collaborative" (p. 15). Second, very little research has been carried out on academic writing in the wiki-based medium in ESL contexts. More importantly, students' attention either to form or to meaning in wiki-based academic writing tasks has been little explored. The following sections give further details about the study.

Statement of the Problem

There have been a great number of studies that investigated collaboration in L2 writing (e.g., Abadikhah, 2012; Tan, Wigglesworth, & Storch, 2010). Those studies

explored the importance of peer review in collaborative writing, and investigated the significance of feedback students give one another (e.g., Nelson & Carson, 1998; Zhu, 2001). However, studies that explore the nature of the collaborative writing process and how students collaborate in specific writing tasks are still unexplored (Kessler, Bikowski, & Boggs, 2012). More specifically, collaborative writing in which students jointly complete specific written tasks is still less explored (Storch, 2011). Hence, applying wiki-based collaborative writing, due to the embedded feature of editability, will bridge the gap in the literature and give a better idea about the way students interact in collaborative writing activities.

Based on the few available studies, wikis have proved to be a great motive for students' writing performance (Chao & Lo, 2011), participation (Moller et al., 2005), communication, collaboration (Lipponen, 2002), and building social communities of practice (Zheng, Niiya, & Warschauer, 2015). Wikis also have promoted a learner-centered learning approach (Zheng et al., 2015) because students perform different roles as writers, readers, and editors simultaneously.

Very noticeably, one of the main affordances of wikis in the classroom is that "students are not only learning how to publish content; they are also learning how to develop and use all sorts of collaborative skills, negotiating with others to agree on correctness, meaning, relevance and more" (Richardson, 2010, p. 61). Klobas (2006), in his book *Wiki: Tools for Information Work and Collaboration*, stated that wikis combine technology, space, information resources, philosophy, and sense of community.

Purpose of the Study

The purpose of this triangulation mixed methods study is to investigate how intermediate-level ESL students interact while doing several different writing tasks on a class wiki and whether this interaction helps students work collaboratively to complete the designated task. It also explores how students in small groups of three negotiate meaning and scaffold one another in the wiki platform. In other words, the study explores students' attention to both form and meaning. Two coding categories have been adapted to examine form-related changes and meaning-related changes: Kessler's (2009) and Kessler and Bikowski's (2010), respectively. What is more, Li (2014) confirmed that many research studies have been carried out to know students' opinions about wiki-collaborative writing (e.g., Chao & Lo, 2011; Li & Zhu, 2013; Lund, 2008); however, little research has been done to recognize why students hold such opinions. As a result, one of the objectives of this study is to explore ESL students' perspectives toward integrating wikis in writing activities and why they hold such perspectives.

Research Questions

The following four main research questions guided this study:

1. To what extent do students participate (i.e., make revisions) in the wiki-based writing activities?
2. What type of participation (addition, deletion) do students focus on when completing the designated writing activities?
3. What is the role of the writing task in the number of form-related changes and meaning-related changes?

4. What are students' perspectives on the use of the wiki in writing assignments? Why?

Significance of the Study

Blending wikis in language teaching and learning is still in its infancy. Although a few studies have been carried out, the primary focus of research on wikis is strongly related to writing skills because of the nature and mechanism of wikis that support editability. Li (2012) confirmed, "The current body of literature predominantly concerned the use of wikis for collaborative writing" (p. 26). As part of conducting a comprehensive meta-analysis research about the use of wikis in English as a second language (ESL) and English as a foreign language (EFL) classes, Li gathered 21 empirical studies, which were published in 14 peer-reviewed computer-related journals. Those studies are grouped into four main themes based on the studies' research objectives: "collaborative writing process, writing product, perception of wiki-based collaborative writing, and effects of tasks" (Li, 2012, p. 17).

Three aspects of this study are significant. First, most, if not all, studies were done in EFL contexts. Li (2014) stated, "No research has reported a wiki collaborative writing project with ESL students in an EAP program in the U.S." (p. 8). Second, although Li's recent study was conducted on ESL students in the United States, those students were graduate students in an English for academic purposes (EAP) program. No studies—to the best of my knowledge—have been conducted on precollege ESL students in the United States. Third, studies that investigated the effect of tasks on collaborative writing (e.g., Alyousef & Picard, 2011; Lee, 2010; Lund & Rasmussen, 2008) are still rare. The aforementioned points indicate a gap in the CALL literature, and I hope this study

bridges the gap, advances our understanding in the line of inquiry, and contributes to the CALL field through exploring wiki-based collaborative writing tasks in ESL institutes in the United States. The findings of this study may therefore be of benefit in L2 writing instruction if instructors are convinced by the effect of wiki-based writing tasks on students' writing performance.

This study targets many people in the field of applied linguistics and second language acquisition. To be more specific, people who have interest in technology and language teaching and learning are the specific target. Such people include, but are not limited to, second and foreign language writing instructors and learners, curriculum designers, and education policy makers.

Limitations and Delimitations of the Study

No single research study is perfect, and this study is no exception. One of the limitations of the study was the small number of participants enrolled in Intensive English for Internationals—the data collection site. As a result, the data were collected over 2 sessions of 8 weeks each in order to collect as many data as possible. The limited number of wiki writing activities and the length of writing affected the data analysis because in intermediate ESL levels, students are not expected to come up with different writing genres and write long essays.

Because the study was conducted on intermediate ESL international students at an urban U.S. Mid-South university, the findings cannot be generalized to all ESL levels or all ESL schools in the United States. It is also beyond the scope of this study to compare collaborative wiki-based writing to face-to-face collaborative writing or to investigate the effectiveness of wiki-based writing on students' writing performance. This study is also

delimited to wiki-based collaborative work and does not include wiki-based individual writing. In other words, it does not compare and contrast autonomy and collaboration on the wiki platform.

In terms of the data collection phase, completing the questionnaire surveys was an issue. It was a little challenging for some students to complete the questionnaire surveys by themselves because they either needed further explanation of questions or did not know how to do it online. This required the teacher to follow up with students and make sure everyone had completed the online questionnaires.

Definition of Terms

CALL. Computer-assisted language learning is a subfield of applied linguistics. It forms an umbrella for all studies pertaining to technology and language teaching and learning.

CMC. Computer-mediated communication refers to the technological tools that are used to establish communication between individuals and groups in specific contexts such as training and learning.

Synchronous and asynchronous. CMC tools can be divided into two main branches: synchronous and asynchronous. While the former involves communication in real time, the latter indicates elapsed time for reflection.

Wiki. A wiki is an asynchronous editable social website that allows users to compose collaboratively written texts.

ESL. ESL stands for English as a second language, where English is taught and learned in an English-speaking country.

Collaborative writing. In this study, collaborative writing refers to what Storch (2013) describes as "an activity where there is a shared and negotiated decision-making process and a shared responsibility for the production of a single text" (p. 3).

Writing activities. The writing activities or tasks in this study refer to the writing assignments that students, in groups of three, were asked to collaboratively complete on the class wiki.

Organization of the Study

Based on current applied linguistics practices and the general guidelines in the graduate school guide at the University of Memphis, this study is organized into five chapters. The headings and subheadings of each chapter are based on careful analysis of current CALL-related studies.

Chapter 1 introduces the wiki environment and sheds light on the common features of the implementation of wikis in language education. Chapter 2 presents a review of the related literature on wiki integration into language education, in general, and composition classes, in particular. Whereas Chapter 3 describes the methodological research approach and data collection methods used in this study, Chapter 4 analyzes data and presents research results. Finally, Chapter 5 discusses the study, interprets the results, and concludes by providing suggestions for application and future research recommendations.

Chapter 2

Literature Review

This chapter begins with a brief description of CMC in language learning, in general, and collaborative writing, in particular. It sheds light on the little research conducted on collaborative writing in CMC environments. It then narrows down the scope of CMC to describing one common type of social applications: wikis and their major features. Afterwards, the remainder of the chapter is devoted to integrating wikis in language education, presenting the theoretical frameworks that inform the study, and delving into the extant studies germane to wikis and collaborative writing in both L1 and L2. The chapter concludes by presenting a gap in the research that makes this study of paramount significance.

CMC and Collaborative Writing

The educational sector has been greatly affected by technological tools that run on the Internet. Such tools have opened new avenues in language pedagogical methods. Beatty (2003) confirmed that advances in web technologies are presenting teachers and learners with simple tools to adapt to a new generation of learning experiences. More significantly, the Internet facilitates the introduction of new social tools that can be beneficial in the teaching and learning process, such as CMC tools.

CMC, either synchronous or asynchronous, refers to the technological tools that are used to establish communication between individuals and groups in specific contexts such as training and learning (Eastment, 1999). However, according to Beatty (2003), CMC is a situation where learning may not occur, but a computer-based discussion may take place. In such a case, there are several opportunities present for learning, specifically

for learners who are engaged in discussions with native speakers of the target language. They may also conduct discussions with those individuals who have nonnative speaking abilities. In a comprehensive description, Sharma and Barrett (2007) referred to CMC as the communication process that allows colleagues and friends to communicate using a simple keyboard. Implicitly noticeable in the above descriptions is that CMC offers simple ways for language learners to communicate and collaborate outside the limits of classroom time.

One of the affordances of CMC tools is the ability to allow learners to exchange ideas and thoughts between minds rather than within minds, thus shaping how language might be used to combine thoughts. This notion is noticeably seen when students post discussions and edit texts in a class wiki, for instance. It seems that communication of individuals with computers has now become communication of individuals with other individuals using computers (Warschauer & Kern, 2000). This idea is very similar to the one presented under the sociocultural perspective known as the concept of sociogenesis, that is, the social production and emergence of the person (Lund, 2008). Other concepts such as collective wisdom by Surowiecki and connectivism by Siemens (Klobas, 2006) are simply applicable when CMC applications are used in language classrooms. With regard to teaching writing, researchers such as Bruffee (1973) and LeFevre (1987), who support the idea of the collaborative writing approach, think that recent CMC technologies offer innovative teaching practices that facilitate collaboration among the new generation of students who admire technology. In other words, writing instructors are suggested to integrate newly invented CMC applications in their writing classes to help students share ideas, negotiate meaning, and write collaboratively.

There is a plethora of definitions in the literature that describe the functionality of the collaborative writing approach. Storch's (2013) description seems strongly relevant to the objectives of this study. She describes collaborative writing as "an activity where there is a shared and negotiated decision-making process and a shared responsibility for the production of a single text" (p. 3). Whereas language learners can engage in collaborative writing in class (i.e., face-to-face), current CMC applications give students the opportunity to compose jointly written texts beyond the limited time in the classroom. This indicates that interaction has become easier because the current generation of students—known as digital natives (Selwyn, 2009)—has the opportunity to interact whenever and wherever they want to. Zeng and Takatsuka (2009) argued that integrating CMC into course syllabi creates a supportive learning environment in which students interact with each other for meaningful purposes beyond the confines of the classroom walls.

Empirically speaking, there is still relatively little research conducted on collaborative writing in CMC environments. According to Storch (2013), the few studies that asked students to write collaborative texts include Tan et al. (2010), Zeng and Takatsuka (2009), and Shekary and Tahririan (2006). Informed by the sociocultural perspective of learning, all previous studies conducted in EFL contexts investigate the patterns of interaction among participants. Whereas Tan et al. (2010) compared face-to-face collaborative writing to online collaborative writing, Zeng and Takatsuka (2009) and Shekary and Tahririan (2006) investigated the nature of language-related episodes in CMC and their impact on language learning. While Tan et al. did not show any superiority of CMC over face-to-face collaborative writing, Zeng and Takatsuka (2009)

and Shekary and Tahririan (2006) concluded that CMC increased learners' attention to linguistic forms and facilitated collective scaffolding. According to Storch, there is little discussion, in all the previous studies, on the nature of students' written products because the online collaborative writing studies used online chat, which is seen as a communication tool more than a text creation application.

Although there is scarce research on collaborative writing in CMC environments, Storch (2013) envisioned that the rapid development of Web 2.0 technology would open the door for language instructors to integrate collaborative social tools such as wikis and Google Docs in writing courses. Because writing is seen as social and contextualized activity where interaction plays a significant role (Li, 2014) and "wikis are hailed as platforms for collaborative writing" (Storch, 2013, p. 119), the following sections give a thorough and comprehensive description of the functionality of wikis.

Overview of Wikis

A wiki is one of the most widespread social collaborative networking tools. There are numerous definitions of the function of wikis in the literature. However, the common feature among these definitions is that wikis encourage collaboration among users. Klobas (2006) defined wikis as "collaborative authoring tools that are accessed through a web browser" (p. 3). Dudeney and Hockly (2007) described wikis as "a collaborative web space, consisting of a number of pages that can be edited by any user" (p. 86). Similarly, Erben, Ban, and Castañeda (2009) stated that a wiki is "a collaborative website that many people can work on or edit" (p. 133).

Wiki is originally a Hawaiian word meaning quick (Leuf & Cunningham, 2001), chosen to indicate the quick process of editing. The word wiki indicates two things: the

wiki site and the wiki software used to create it. Klobas (2006) stated, "Wiki sites are collections of interlinked documents and files accessible and editable, by web browser" (p. 3). A wiki basically indicates a website that enables editing, adding, or changing of a complete page. Therefore, a wiki is best defined as "a freely expandable collection of interlinked Web pages, *a hypertext system* for storing and modifying information—*a database*, where each page is easily editable by any user with a forms-capable Web browser client" (Leuf & Cunningham, 2001, p. 14). It is clear that these definitions describe this tool as an open-source productive platform for social contribution.

The first wiki, Portland Pattern Repository or WikiWikiWeb, dates back to 1995 when Ward Cunningham created it. The primary purpose of this wiki was for communication within the small software developers' community (Klobas, 2006). Up until the end of the last century, wikis were the aim of small computing groups. In 2000, there was a noticeable development in wikis to cover collaborative multimedia communities. Leuf and Cunningham (2001) described wikis as "the simplest online database that could possibly work" (p. 15) because it is simple to edit, change, or add a new piece of information.

The philosophy of wikis is based on the principles of soft security rather than hard security. These principles are summarized by Klobas (2006) in that the good faith of the participant is always assured: review of texts is monitored, there is a principle of forgive and forget when mistakes are made, damage is limited, and there is an overall fair process, all of which give all participants a chance to express their views openly. The default setting of a wiki is open for the public to contribute to it; however, it can also be set to private for a small group of collaborative participants such as in classroom wikis. Wikis

encourage all participants, within a given topic area, to contribute toward the final result of the content due to the continuous changes that can take place. This is the basic notion of the well-known site Wikipedia. Jimmy Wales, the creator of Wikipedia (as cited in Richardson, 2010), confirmed this concept: "Imagine a world in which every single person on the planet is given free access to the sum of all human knowledge. That's what we're doing" (p. 55).

According to Richardson (2010), Wikipedia proves that the concept of everyone working together can be better than working alone. This may be useful in educational settings to enable learners to criticize, evaluate, and express their opinions freely. Therefore, learners not only collaborate to complete a task together, but also scaffold one another, promote collaborative communication, and encourage autonomous learning. Owing to the nature of the wiki environment, it might have a great impact on language education, especially collaborative autonomous language learning. To get a better idea of the mechanism of wikis and their potential use in language education, the following section will shed light on major pros and cons.

Features of Wikis

There are many advantages associated with wiki environments. Content can be easily accessed online, pages can be collaboratively edited, external resources can be linked, webpages can be updated quickly, a history of changes can be saved automatically, recent changes can be viewed and participants notified of changes via email, search capabilities are enabled, and overall the whole structure is less sophisticated when compared with webpages (Klobas, 2006). The simple process of editing on a wiki page is much easier than that involved on a traditional webpage.

Whereas webpage editing is a long and complicated process requiring a background in programming languages, wiki page editing is simple and can be done by any users even if they have little knowledge of technology. The process involves four simple stages: opening the page, clicking the edit button, making the changes, and saving. This simplicity reflects why the name wiki has been chosen for this collaborative social tool. Farabaugh (2007) confirmed the collaborative role of wikis for students by stating:

> Contrary to the offerings of many current educational software programs, such as the commercial products Blackboard and WebCT in the United States, wikis provide minimal structure: they offer students the opportunity to create a series of web pages, to revise their own work and the work of others; to comment, to reconnect different pages and to delete pages. (p. 42)

In addition, working on wikis gives students an opportunity to add, delete, or change written text. This advantageous feature distinguishes wikis from other social tools. Lund (2008) assured, "What separates the wiki from other online, distributed environments such as, for example, learning management systems (LMSs) and groupware applications is its open architecture" (p. 41). Using tags and folders, allowing automatic backups, enabling customizable templates, and providing an advertisement-free site, which is important to keep students focused on the course content and lessen distractions, are significant features of wikis. Pedagogically significant, wikis permit collaboration among many students under the supervision of the teacher. Lund confirmed that a wiki documents the writing process and the writing product at the same time.

Not only do wikis document the writing process and product, but they also help language teachers in assessing students' written contributions. The assessment process is feasible because every single action is automatically saved and the archive can be checked at any time, providing a complete history of student participation. Also, the

discussion tab is considered to be a good motivator for students to improve their negotiation of meaning skills. Richardson (2010) confirmed that such a give-and-take feature served students well for the future. It is possible to attach pictures, graphics, and some animated figures to a wiki, which attracts students and provides further information. Erben et al. (2009) assured, "This is clearly appealing to the digital generation, who are not used to seeing only words on a page" (p. 135).

However, wikis have been criticized for the nature of their continuous editing ability. This means that the content is unstructured when compared with other online environments such as discussion forums. Klobas (2006) confirmed that the process of adding links and pages to a wiki indicates no predefined structure. Another significant drawback relates to intellectual property or copyright issues within publishing material on wikis. That is why all open wikis, such as Wikipedia, have to declare the copyright to be owned by the collective and assign rights to reuse the material under the Creative Commons license. With regard to the use of wikis in education, the assessment process of students' collaborative work is a major pitfall (Zheng et al., 2015).

Wikis in Language Education

Technically and in light of the core functionality of wikis, different teaching approaches and pedagogical principles can be applied when implementing wikis in language teaching. Collaboration, an advantageous feature of wikis, is viewed through the lens of two main theoretical constructs: the sociocultural theory of learning (Vygotsky, 1978), which umbrellas the notions of the zone of proximal development (ZPD) and scaffolding, and the interaction hypothesis (Long, 1983), which informs how participants in this study responded to wiki-based collaborative activities. While the study is heavily

contingent on the previous two constructs, other current pedagogical approaches such as communicative language teaching (CLT), task-based language teaching (TBLT), and computer-supported collaborative learning (CSCL) strongly mirror the mechanism of wikis in language learning. To meet the objectives of the study, the following describe wikis in education through the lens of several collaborative teaching approaches that reflect the aforementioned theoretical constructs.

To begin with, collaboration, which reflects the nature of wikis, encourages students to assist one another to complete a common task. Beatty (2003) defined collaboration as "a process in which two or more learners need to work together to achieve a common goal, usually the completion of a task or the answering of a question" (p. 109). Collaboration and cooperation are important aspects in language education to foster assistance between learners and make progress in the learning process; however, there is an almost subtle difference between the two concepts. It appears that collaboration is more than working together and therefore is regarded as a good concept for social interaction, which aligns with the nature of a wiki environment. Dillenbourg, Baker, Blaye, and O'Malley (1996) described this difference, according to the division of a task, by stating, "in cooperation the task is split (hierarchically) into independent subtasks; in collaboration cognitive processes may be (heterarchically) divided into intertwined layers" (p. 189).

Not only do wikis motivate students to work collaboratively, but they also enable students to form their own social community of practice. Collaboration in a class wiki is strengthened by a learning communities approach (Zheng et al., 2015). Furthermore, people are considered active participants in a community of practice if they have access

to different activities, information, and resources, as well as participate with other members of that community of practice (Lave & Wenger, 1991). The idea is clearly noticeable when students "do things together, negotiate new meanings, and learn from each other" in the wiki environment (Wenger, 1998, p. 102). Having students collaborate on the content of a class wiki promotes students' autonomy as well. In other words, students self-direct learning as they add, edit, delete, or change that content.

Current approaches of language teaching and learning encourage self-directed learning (SDL) or autonomy. Merriam (2001) assumed that SDL was a pivotal aspect of adult education that leads to successful learning. Interestingly, many people believe that autonomy and collaboration do not coexist easily; however, participating in a wiki through collaborative writing can therefore foster student autonomy. Erben et al. (2009) claimed that students have full control over the pages written in a wiki, which as a result can encourage their self-centered teaching. However, in order for language learners to collaboratively complete a task on a wiki, guided autonomy is strongly needed (Raby, 2007). By allowing students to post new topics for open discussion, allotting enough time to do specified tasks, and specifying some learning expectations, teachers implicitly encourage autonomous learning (Kessler, 2009).

As one of the aspects of communicative language teaching (CLT), TBLT is easily achieved when infusing wikis into language classes. Müller-Hartmann and Ditfurth (2010) pointed out, "TBLT supports meaning production through technology use" (p. 19). By reviewing nine different definitions of a task, Ellis (2003) identified the six features a task involves: (1) it is a work plan, (2) it primarily focuses on meaning, (3) it provides real-world use of language, (4) it involves one of the four language skills, (5) it engages

the cognitive process, and (6) it promotes a communicative outcome. Interestingly, Storch (2013) confirmed, "The distinguishing features of CLT and TBLT are the use of pair and group work on tasks that engage learners in communication" (p. 21). Such tasks that require pair or group interaction generally include collaborative writing (Storch, 2013) and are easily applicable in the wiki-collaborative activities. More practically and in order for teachers to fully guide students' participation in a class wiki, writing assignments that focus on task- or project-based learning is recommended. By designing a specific task such as designing a brochure or contributing to a written essay, students not only utilize the class wiki as a stimulus to merely do the task, but they also "develop and refine higher level thinking skills" (Solomon & Schrum, 2010, p. 136).

Upon reviewing current wiki-related research studies, it appears that sociocultural theory (SCT), where participants collaborate to complete a designated task, informs almost all studies regardless of the objectives of those studies. This is understandable because integrating wikis in language classes allows students to collaboratively complete predefined tasks, meaningfully communicate, and help scaffold one another. In other words, the concept of a zone of proximal development (ZPD), which comes under the umbrella of SCT, is clearly noticeable. Proposing that learning takes place through social interaction in learners' ZPD, Vygotsky (1978) described the ZPD as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Thus, Lund (2008) purported that wikis have "the potential to advance and realize a collective ZPD" (p. 40).

Furthermore, teaching approaches that support collaborative language learning refer to Vygotsky's SCT, which suggests that the learning process is a social rather than a mental structure of an individual, and therefore such a process encourages collaborative participation among learners (Torres & Vinagre, 2007). Van Nguyen (2010) also insisted, "In SCT, learning is a process that entails not only internalisation of the knowledge of the learning task, but also transforming and using the internalised knowledge for other purposes in the process of the learner's social and cognitive development" (p. 204).

DuBravac, Liskin-Gasparro, and Lacorte (2013) believed that SCT and social constructivism are the two aspects of learning that are dominant in second language acquisition and technology in the world today. Parker and Chao (2007) assured that the social nature of wikis is in line with the constructivist views, which implies that knowledge and meaning are socially constructed. Zheng et al. (2015) affirmed, "The ability to easily create hyperlinks to outside webpages as well as other wiki pages potentially enables users to connect prior knowledge with new knowledge as they collaborate on projects" (p. 4).

Strongly related to SCT and ZPD is the idea of scaffolding, which takes place when participants work in groups to engage in collaborative writing. Studies on collaborative writing such as Storch (2005), Lee (2010), and Li and Zhu (2013) cite scaffolding as a fundamental cornerstone. Scaffolding is defined as "a kind of 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). Ellis (2008) states that "scaffolding is not dependent on the presence of an expert, it can also arise in interactions between learners" (p. 538). With the help of scaffolding, students

assist one another in constructing the ZPD when they have the chance to interact. The opportunity for interaction is always present in wiki-based writing, because students are required to complete a jointly written product. Oddvik (2014) confirmed that interaction between individuals is always emphasized in the SCT of learning.

Different from but related to SCT, Long's interaction hypothesis (1983) is the second main theoretical construct that informs this study and clearly explicates how participants interact in wiki-based collaborative writing. Long claimed that engaging in interpersonal interaction in which communication problems arise facilitates L2 acquisition (as cited in Ellis, 2008). Li (2014) believed, "Learners used language not just to communicate topics and make input more comprehensible, but also to negotiate social relationships" (p. 22). In wiki-collaborative writing, "Language, serving as a mediating tool, assists learners to co-construct knowledge and solve problems through interaction" (Li, 2014, p. 23). Considering interaction from the perspective of SCT, Lantolf (as cited in Ellis, 2008) confirmed, "The central and distinguishing concept of sociocultural theory is that higher forms of mental activity are mediated" (p. 270). He suggested three kinds of mediation that facilitate L2 learning: "mediation by others in social interaction, mediation by self through private speech, and mediation by artifacts (for example, tasks and technology)" (p. 270). Incorporating wiki-based writing activities into L2 classes includes two types of mediation, that is, mediation in social interaction and mediation by artifacts. It can be said that social networking applications give great opportunities for L2 learners to communicate easily and openly, which was difficult to achieve before the advent of such applications.

Interestingly enough, innovative social applications (e.g., wiki-based writing) facilitate the application of collaborative learning. Bearing in mind the idea of Slavin (1980), who proposed that collaborative learning is an instructional technology, CSCL appears as a new pedagogical approach "to create the shared goals and social learning space required for collaborative learning in the classroom" (Zheng et al., 2015). According to Miyake (2007), CSCL is defined as the implementation and evaluation of different technological applications (i.e., social networks) in order to create an active learning atmosphere with generative knowledge.

From the perspective of language instructors, CSCL plays a significant role in the ESL classroom. In a very recent study, Oddvik (2014) confirms, "Using CSCL in the ESL classroom can open possibilities for students to fulfill the teacher's object of language learning, collaborating successfully and create knowledge in the process and internalize it individually" (p. 20). Not only do collaborative learning and technology go hand in hand, but they also reflect current teaching approaches—that is, social constructivism in which SCT is prevalent.

To summarize and in light of the above theoretical and pedagogical frameworks, Ellis (2008) confirmed that SCT "views language acquisition as inherently social practice that takes place within interaction as learners as assisted to produce linguistic forms and functions that they are unable to perform by themselves" (p. 206). Ellis' description of SCT can be clearly noticed and easily applied when language learners are given the opportunity to collaborate in wiki-based writing. The next section describes how wikis are effectively incorporated into composition courses.

Wiki-Related Studies

To better understand the effectiveness of wikis in language teaching and learning, this section investigates previous empirical research and points out the key findings. Whereas previous studies approached the use of wikis in teaching practices differently, almost all studies are primarily based on the aforementioned theoretical principles, especially SCT. Practically, rather few studies on the use of wikis in education have been done (Alzahrani, 2012); however, such studies are mainly related to writing skills because the nature of wikis as an editable environment facilitates collaborative writing. This section is twofold; the first part investigates wiki-based empirical studies in the L1 context, and the second part discusses research studies carried out in L2 classes.

Wikis in L1 context. Research studies conducted in mainstream classes are relatively rare compared to studies in the L2 context. Storch (2013) confirmed that there is still a paucity of wiki-based studies in L1 contexts that substantiate the effectiveness of wikis in writing proficiency. In a very successful effort, she synthesized 16 empirical studies that were published from 2006 to 2011 in various computer-related refereed journals. Because those studies have different designs, objectives, and contexts (i.e., subject content), the comparison between those studies is difficult (Storch, 2013). By examining the 16 studies, it can be said that this body of research investigated two main strands: students' attitudes toward wikis and students' contributions to wiki projects. Moreover, those studies are related to adult education more than adolescent learners.

In terms of participants' attitudes, several studies showed that participants' perceptions toward wiki-based writing are generally positive. Elgort, Toland, and Smith (2008) conducted a study on 27 information management students who collaboratively

reported on five articles in two different courses. By the end of the courses, students expressed positive attitudes toward wikis in writing. Similarly, in an education course, Lin and Kelsey (2009) asked 18 students to conduct a small project that included writing and editing five articles. The project followed three stages: individual collaboration, peer review, and finally team collaboration. By the end of the project and through interviews, students held positive attitudes about wikis in writing projects. Not only do students like wiki-based writing, but teachers do as well. In a teacher trainee course, Matthew, Felvegi, and Callaway (2009) asked 37 future teachers to amend existing wiki course content during one semester. Teachers' perceptions, elicited in interviews, were positive.

In contrast, negative attitudes toward wiki-based activities were also reported in other studies. In a study on political science students, which lasted a month, Carr, Morrison, Cox, and Deacon (2007) teamed up 174 students into groups of 4–6 and guided them to come up with a well-written essay. The research results showed that only a small number of students held positive attitudes about wikis. Likewise, in a 10-week study on 180 students in an architecture class, Osman-Schlegel, Fluker, and Cheng (2011) reported that a large number of participants found that working on wikis is a difficult task, particularly if groups are large. In Witney and Smallbone's (2011) study, 153 business students were asked to conduct a group project. As an option to complete the project collaboratively, wikis were introduced to the students; however, the findings indicated that many groups chose not to use wikis, and those who did only used them a little. It seems a large group size of participants greatly affects students' general perception of wiki-based writing if we try to compare the divergent attitudes in the previous studies. Worth noting is that students generally expressed their opinions, either positive or

negative, based on their participation in the designated tasks. In other words, students' attitudes are shaped by their contributions and discussion.

As the second strand of research, students' contributions to and engagement with the wiki content are rare (e.g., Hughes & Narayan, 2009; Jones, 2010; Neumann & Hood, 2009). Such types of studies are perception-based, which elicited a contribution rate based on surveys and questionnaires. Storch (2013) argued that those types of studies "do not necessarily reflect accurately the students' frequency of contributions and level of engagement" (p. 133). However, studies measuring the frequency of collaboration based on the analysis of wiki postings (i.e., number of edits) reported similar results (e.g., Elgort et al., 2008; Grant, 2006; Judd, Kennedy, & Cropper, 2010). By examining the reasons behind students' little contribution in wiki-based writing, Storch (2013) confirmed that reluctance to participate, uneven contributions, the size of groups, the nature of writing tasks, and writing assessment are major reasons.

Nevertheless, wikis are touted as collaborative platforms that encourage discussion and engagement, Lin and Kelsey (2009) confirmed students' participation and discussion in wiki-based writing increase over time. In their study on graduate education students, they identified three distinct phases in wiki projects: exploration, adaptation, and collaboration. In the exploration phase, students did not recognize the task and lacked comfort in peer review. Over time, they adapted themselves to the wiki site, as a second phase, and communicated both face-to-face and online. Ultimately, they built a trusting relationship and their collaboration increased. Not only are these phases attributed to time, but also careful design and sufficient training improve levels of contributions, which by

the end shape participants' overall perception toward wiki-based collaborative writing (Judd et al., 2010).

Because wiki-based empirical studies in L1 were limited in terms of language writing, and the scope of this study is within the L2 context, the following section presents wiki-related studies in both ESL and EFL to get a better idea about wiki-based writing.

Wikis in L2 classes. Whereas the body of research studies in L2 contexts is relatively larger than that of studies in L1, much of this empirical research was carried out in EFL contexts. Li (2012) conducted a comprehensive meta-analysis about the use of wikis in ESL and EFL classes. She cited 21 empirical studies that were published in 14 peer-reviewed computer-related journals. After in-depth review, she concluded, "The current body of literature predominantly concerned the use of wikis for collaborative writing" (p. 26). Based on the studies' research objectives, she grouped the 21 empirical studies into four main themes: "collaborative writing process, writing product, perception of wiki-based collaborative writing, and effects of tasks" (p. 17). Whereas some studies investigated the writing products (e.g., Kuteeva, 2011; Wichadee, 2010) and the effect of tasks on collaborative writing (e.g., Alyousef & Picard, 2011; Lee, 2010; Lund & Rasmussen, 2008), several studies examined the writing process (Kessler, 2009; Kessler & Bikowski, 2010; Kost, 2011; Woo, Chu, Ho, & Li, 2011) and the perception of participants in the wiki space (Anzai, 2009; Ducate, Anderson, & Moreno, 2011; Elola & Oskoz, 2010; Kost, 2011; Li & Zhu, 2013).

There is no doubt that students are better trained to consider writing as a process, and this notion goes hand in hand with Perl (1994) who suggested that writing is a

recursive process, which is very significant for students and writing instructors alike. Because wikis enable students to revise and review one another's work through editing, Kessler (2009) conducted a study on 40 preservice EFL teachers at a Mexican university to monitor the writing process. Students created a class wiki where they reflected on their understanding of culture. Results showed the students' attention to form or grammatical structure in the wiki-based activities increased.

Almost all current studies confirmed that teachers and students expressed positive attitudes toward wiki-based writing. Alzahrani (2012) carried out a study on 24 students at a Saudi university to determine their perspectives toward using wikis as an e-learning tool. The findings showed that students preferred integrating wikis into learning. Likewise, Al Khateeb (2013) conducted a qualitative study on a group of instructors who teach EFL writing classes in Saudi Arabia. The objective of the study was to recognize the instructors' opinions on merits, demerits, and the implementation of wiki-based tasks in writing courses. The results revealed that the instructors expressed positive attitudes toward utilizing wiki-based writing activities.

Not only do wiki-based activities motivate students to write, but they also help students brush up their writing skills. At an Asian university, Wichadee (2010) designed a one-group pre-/post-test study to compare 35 students' English writing summaries. By working in groups for 8 weeks in a wikispace, the mean score of students' writing summaries on the post-test was higher than the pre-test score. The findings also showed that students had positive attitudes toward learning through a class wiki. Similarly, Alshumaimeri (2011) did an experimental study in which he investigated the effect of wikis on 42 male students' writing skills during their preparatory year at a Saudi

university. Tests indicated both control and experimental groups improved in writing accuracy and quality; yet, when comparing the two groups, the experimental group notably outdid the control group in both writing accuracy and writing quality.

The correlation between wiki-based activities and students' writing performance is another area that has attracted some researchers. Khodary (2010) examined the effect of wikis on prospective EFL teachers' writing performance. She used a writing performance test to pre- and post-test two groups of 30 students. The findings showed a statistically significant difference in the postwriting performance test in favor of the treatment group. The study confirmed that the significant difference between the two groups is due to the reflections and peer reviews that the wiki provided. Equally, Za'za' and Ahmed (2012) compared both face-to-face and wiki collaborative writing of two groups of 66 female students at a Saudi university to investigate the most effective instructional method. The results clearly showed that the students who worked on the wiki outperformed the traditional group in terms of writing performance.

Other studies examined the difference between individual and collaborative writing on wikis. Liou and Lee (2011), for example, compared individually and collaboratively produced texts in a wiki environment. A group of students was asked to complete two writing tasks on a wiki, individually and collaboratively. The findings of the study revealed that the collaborative wiki-based task encouraged the participants to communicate and scaffold one another compared to the individual wiki-based task. As a result, the students' writing skills improved.

As far as writing genres are concerned, Aydın and Yıldız (2014) carried out a study to examine the effect of task type on students' writing performance. For the

purpose of the study, 34 intermediate-level university students learning EFL were selected. They were asked to collaborate on three wiki-based writing tasks (argumentative, informative, and decision-making). The findings revealed that students focused on meaning more than form in all three tasks. Also, wiki-based collaborative tasks encouraged the students to use grammatical structures 94% of the time. The students had positive attitudes toward the use of wikis in writing classes, and they believed it helped improve their writing performance.

Apart from examining writing skills per se, Kuteeva (2011) carried out a case study on a group of students taking a course, titled *Effective Communication in English*, to investigate the relationship between reading and writing on a wiki and whether a wiki fosters students' interaction. The results indicated that students in the wiki medium not only paid closer attention to grammatical accuracy and cohesive structures, but also about 60% of the participants recounted that wiki-based writing encouraged them to think about readers. Thus, the study concluded that integrating a wiki in the course raised students' awareness about the audience and increased interaction among participants.

The previous studies clearly indicate that wiki-based teaching and learning are effective on the condition that well-designed teaching methods are provided. In a very recent study, Zheng et al. (2015) conducted design-based research over four semesters at a university in northern China. The researchers developed nine effective instructional strategies in three categories (developing a learning community, supporting knowledge construction, and enabling cognitive apprenticeship) that are useful in wiki-based activities. The research concluded that "the use of wikis alone do not guarantee successful collaborative learning activities" (p. 19). This conclusion is in total agreement

with Neumann and Hood (2009) who confirmed that a wiki is a collaborative site if it is enacted collaboratively; otherwise, it is merely a static information site. For students to successfully collaborate in wiki-based writing, the following section gives practical tips and suggestions.

Wikis in Composition Courses

A wiki per se is not an educational tool if not properly designed and used for educational purposes. Furthermore, no single formula can be taken for granted when blending wikis in language classes. However, several possible applications are helpful in teaching English skills and particularly writing due to wikis' built-in editable feature. Duffy and Bruns (2006) suggested the following practical uses:

- Wikis help students in conducting and developing research projects because the process of collaboration is entirely documented.
- Students can use wikis to reflect on their readings by posting summaries and comments and forming an annotated bibliography.
- In online learning, wikis help language instructors publish syllabi and handouts and negotiate the content with students.
- For the importance of building a good rapport with students and obtaining feedback, language instructors can use wikis as a web suggestion box, where students have the opportunity to reflect on the teaching practices and post comments.
- Students can use a class wiki to brainstorm, outline, and share ideas in order to complete a specified task.

- Instead of popular presentation programs such as PowerPoint, wikis give students a chance to directly comment on presented topics.
- There is equal opportunity for students to collaboratively participate on a class wiki because it is open around the clock.
- For course evaluation, students can use wikis to collaboratively review the courses taken, as well as post their perspectives.

As mentioned in the previous sections, recent studies suggest that the obvious pedagogical use of wikis is to support writing skills. This is clearly noticeable because of the strong match among the mechanisms of wikis' technological environments, that is, built-in editable characteristics and the importance of edits, reviews, and feedback in writing assignments. In one example of why wikis are preferable among writing teachers, Lamb (as cited in Parker & Chao, 2007) reported that the wiki "Why Use Wikis to Teach Writing" lists the following advantages for blending wikis in teaching writing courses.

- Wikis allow students to add pictures and illustrations to writing; thus, students are stimulated to write and explain thoughts in more depth.
- For the simplicity of using wikis, students focus on texts more than software. Thus, they communicate and collaborate more effectively.
- Wikis help students write for an audience.
- Wikis encourage close peer review and self-revision; therefore, students are implicitly trained to view writing as a process and not as a finished product.

More practically, Barton (as cited in Parker & Chao, 2007) mentioned innovative uses for wikis in composition classes. Those applications include, but are not limited to, the following:

- designing a class project that helps students in writing, such as a handbook of manuals and grammar references;
- building a site that functions as a repository where students collect and link to other writing resources that are related to writing topics; and
- setting up a wiki site around different topics that students want to share with one another.

To reiterate, depending solely on wikis or other newly invented technologies in language teaching and learning is not sufficient. Thus, the importance of designing writing tasks, the role of teachers in coordinating the learning process, and the significance of training students how to use a wiki represent the cornerstones when infusing wikis into language classes (Li, 2012).

Need to Study

One of the major contributions of wikis in the classroom is that "students are not only learning how to publish content; they are also learning how to develop and use all sorts of collaborative skills, negotiating with others to agree on correctness, meaning, relevance and more" (Richardson, 2010, p. 61). Klobas (2006), in his book *Wiki: Tools for Information Work and Collaboration*, stated that wikis combine technology, space, information resources, philosophy, and a sense of community.

As far as collaborative writing concerned, studies in both L1 and L2 settings proved the great potential of wikis, due to built-in collaborative features, in writing skills; however, as "no research has reported a wiki collaborative writing project with ESL students in an EAP program in the U.S." (Li, 2014, p. 8), the nature of interaction among

small groups of participants and the effect of writing tasks on students' collaborative writing have as yet been unexplored.

As a result, this study intends to bridge the gap and contribute to the literature. It investigates the type of interaction, collaboration, and perspectives of intermediate-level ESL students at a U.S. university in collaboratively doing three different writing tasks, namely, summary, compare/contrast, and classification paragraphs. More importantly, the effect of these tasks on students' attention to either form or meaning is examined accordingly. To get a better idea and complete picture of the study design, the following chapter discusses the research methodology in further detail.

Chapter 3

Research Methodology

In this chapter, I describe the methodological research approach I employed in this study. This chapter also presents several sections that formulate the components of this research study, such as the research design, pilot study, data collection methods, data collection procedure, and data analysis procedure. As stated in Chapter 1, the main purpose of this study was to examine how intermediate-level ESL students in an intensive English program (IEP) interact and collaborate when they respond to three different writing activities in a wiki-based platform. More specifically, the objective of this study is to find answers to the following questions:

1. To what extent do students participate (i.e., make revisions) in the wiki-based writing activities?
2. What type of participation (e.g., addition, deletion) do students focus on when completing the designated writing activities?
3. What is the role of the writing task in the number of form-related changes and meaning-related changes?
4. What are students' perspectives on the use of the wiki in writing assignments? Why?

Research Design

In this inquiry, I employed a mixed-methods approach that combines both quantitative and qualitative methods to obtain as much information as possible, and to find complete answers to the set of research questions concerning wikis in writing courses. Several social scientists acknowledge the mixed-methods approach; for example,

Sandelowski (2003) suggested that mixed-methods research has become commonly used and is methodologically fashionable. Onwuegbuzie and Leech (2005) stated, "Monomethod research is the biggest threat to the advancement of the social sciences" (p. 375). In applied linguistics research studies, there is a growing tendency to use a mixed-methods approach (Dörnyei, 2007). Mixed-methods research is defined as "a procedure for collecting, analyzing, and mixing quantitative and qualitative data at some stage of the research process within a single study to understand a research problem more completely" (Creswell, as cited in Ivankova & Creswell, 2009, p. 137). It can be argued that mixing or blending of data provides a better understanding of the questions than using a single approach alone (Creswell, 2014).

Quantitative measures, in this study, are used to investigate the general attitudes of students on wiki-based collaborative writing, whereas qualitative measures are used with the aim of exploring the reasons behind such perspectives as well as how students in small groups interact in completing designated writing tasks. Nevertheless, both quantitative and qualitative measures are integrated into different stages of this research process, particularly in the data interpretation stage. Ivankova and Creswell (2009) noted, "Mixing of the two methods occurs either at the data analysis stage or during data interpretation of the results" (p. 142).

Participants

The main participants in this study were international students enrolled in the IEP at an urban U.S. Mid-South university. It is a common tradition that international students whose native language is not English are enrolled in intensive English academic courses to improve language skills before being admitted into undergraduate and graduate

programs throughout the United States. Based on placement tests run by the IEP, students are placed in different levels according to their English proficiency. To meet the objectives of this study that require the ability to produce writing, I conducted the study with 18 intermediate-level students who voluntarily participated. To maintain diversity among participants, I gleaned basic information such as age, gender, nationality, and home country from the participants using an information sheet (see Appendix A). Having different ethnic backgrounds, participants were 50/50 male and female with an average age of 25.78 years and an average time of 3.91 years of studying English. Table 1 presents detailed information about the participants.

Table 1

Demographic Information

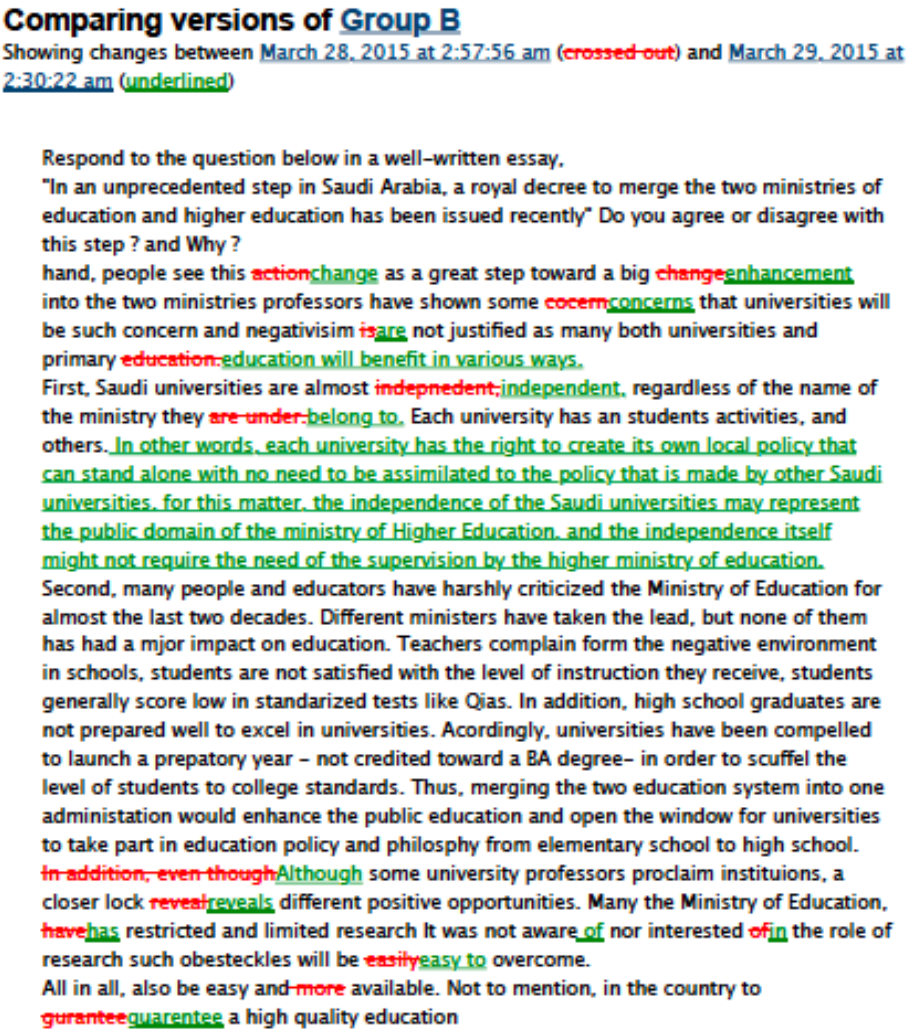
Participant	Nationality	Gender	Age (Years)	Home Country	Years of Learning English
1	African	F	40	South Sudan	2
2	Saudi	F	23	Saudi Arabia	Less than 1
3	Saudi	M	23	Saudi Arabia	1.6
4	Italian	F	27	Italy	2
5	Saudi	F	21	Saudi Arabia	2
6	Saudi	M	19	Saudi Arabia	1
7	Palestinian	M	26	Palestine	1
8	Japanese	M	20	Japan	1
9	Mexican	M	37	Mexico	1
10	Jordanian	M	26	Jordan	17
11	Jordanian	M	24	Jordan	9
12	Korean	F	19	Korea	5 months
13	Korean	F	21	Korea	3
14	Korean	F	19	Korea	5 months
15	Kazakhstani	F	26	Kazakhstan	1
16	Japanese	F	33	Japan	1
17	Jordanian	M	33	Jordan	20
18	Jordanian	M	27	Palestine	1

Pilot Study

Before collecting the actual data, I conducted a pilot study on 15 international Ph.D. students who were pursuing their degrees in English or other related fields. The major purpose of piloting the study was twofold: first, to ensure that the class wiki is secure, easy to use, and without technical glitches when participants engage in writing, and second, to check the validity and reliability of the postquestionnaire survey and make sure all items are comprehensible. Many researchers recognize the significance of testing the data collection instruments before conducting the actual study. Betty (as cited in Alghammas, 2010) confirmed, "Surveys need to be carefully piloted with a small group first" (p. 41). Sudman and Bradburn (1983) further urged the necessity of piloting by stating, "If you do not have the resources to pilot-test your questionnaire, don't do the study" (p. 283).

After setting up the class wiki, the 15 participants were randomly assigned to 5 groups of 3 participants each. Fifteen usernames and passwords were automatically generated and sent to participants to get access to the designated groups. In their groups, participants were required to respond to the following prompt with a well-written essay: *In an unprecedented step in Saudi Arabia, a royal decree to merge the two ministries of education and higher education has been issued recently. Do you agree or disagree with this step? Why?*

After collecting the five collaborative essays, eight participants were randomly selected to complete the online survey. By the end of the pilot study, valuable comments and practical suggestions were given, which helped to refine and adjust some data collection procedures. A sample of a wiki-based collaborative essay collected in the pilot study phase is shown in Figure 1.



Comparing versions of Group B

Showing changes between March 28, 2015 at 2:57:56 am (~~crossed-out~~) and March 29, 2015 at 2:30:22 am (underlined)

Respond to the question below in a well–written essay,
"In an unprecedented step in Saudi Arabia, a royal decree to merge the two ministries of education and higher education has been issued recently" Do you agree or disagree with this step ? and Why ?
hand, people see this ~~action~~change as a great step toward a big ~~change~~enhancement into the two ministries professors have shown some ~~cocern~~concerns that universities will be such concern and negativisim ~~is~~are not justified as many both universities and primary ~~education.~~education will benefit in various ways.
First, Saudi universities are almost ~~indepnedent,~~independent, regardless of the name of the ministry they ~~are under.~~belong to. Each university has an students activities, and others. In other words, each university has the right to create its own local policy that can stand alone with no need to be assimilated to the policy that is made by other Saudi universities. for this matter, the independence of the Saudi universities may represent the public domain of the ministry of Higher Education. and the independence itself might not require the need of the supervision by the higher ministry of education.
Second, many people and educators have harshly criticized the Ministry of Education for almost the last two decades. Different ministers have taken the lead, but none of them has had a mjor impact on education. Teachers complain form the negative environment in schools, students are not satisfied with the level of instruction they receive, students generally score low in standarized tests like Qias. In addition, high school graduates are not prepared well to excel in universities. Acordingly, universities have been compelled to launch a prepatory year – not credited toward a BA degree– in order to scuffel the level of students to college standards. Thus, merging the two education system into one administation would enhance the public education and open the window for universities to take part in education policy and philosphy from elementary school to high school.
~~In addition, even though~~Although some university professors proclaim instituions, a closer lock ~~reveal~~reveals different positive opportunities. Many the Ministry of Education, ~~have~~has restricted and limited research It was not aware of nor interested ~~of~~in the role of research such obesteckles will be ~~easily~~easy to overcome.
All in all, also be easy and ~~more~~ available. Not to mention, in the country to ~~gurantee~~guarentee a high quality education

Figure 1. A sample of a collaborative essay in the pilot study.

Class Wiki

There are several wiki sites available on the Internet. Although there are many similarities among wiki platforms, PBworks (http://www.pbworks.com) was chosen for

this study for several reasons. First and foremost, the researcher is well acquainted with this site as he used it in one of his graduate courses (i.e., Online Language Learning). Second, this wiki site is very easy to use and has a user-friendly interface. Above all, it is free of charge and can be made private or password-protected, which is very convenient for language classes.

A private class wiki was set up at http://eslcomposition.pbworks.com (see Figures 2 and 3), and participants in 6 groups of 3 students each collaborated on the writing tasks posted by the researcher with the help of the writing instructor. The group size was determined to be 3 students in each group because previous studies (e.g., Dobao, 2012; Morgan, Allen, Moore, Atkinson, & Snow, 1987) suggested that 3 or 4 is an ideal number for successful collaboration. Although the groups were given the same writing activity prompts, members of one group did not have access to other groups to help the researcher explore the interaction within groups in more depth.

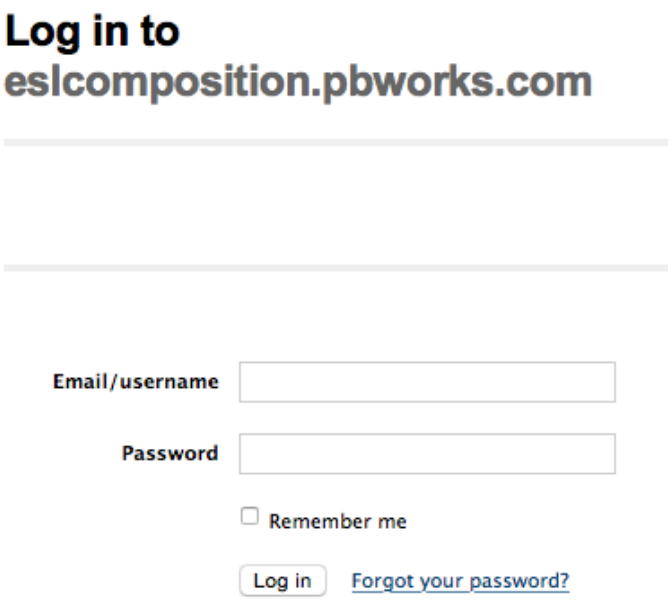


Figure 2. Private class wiki login page.

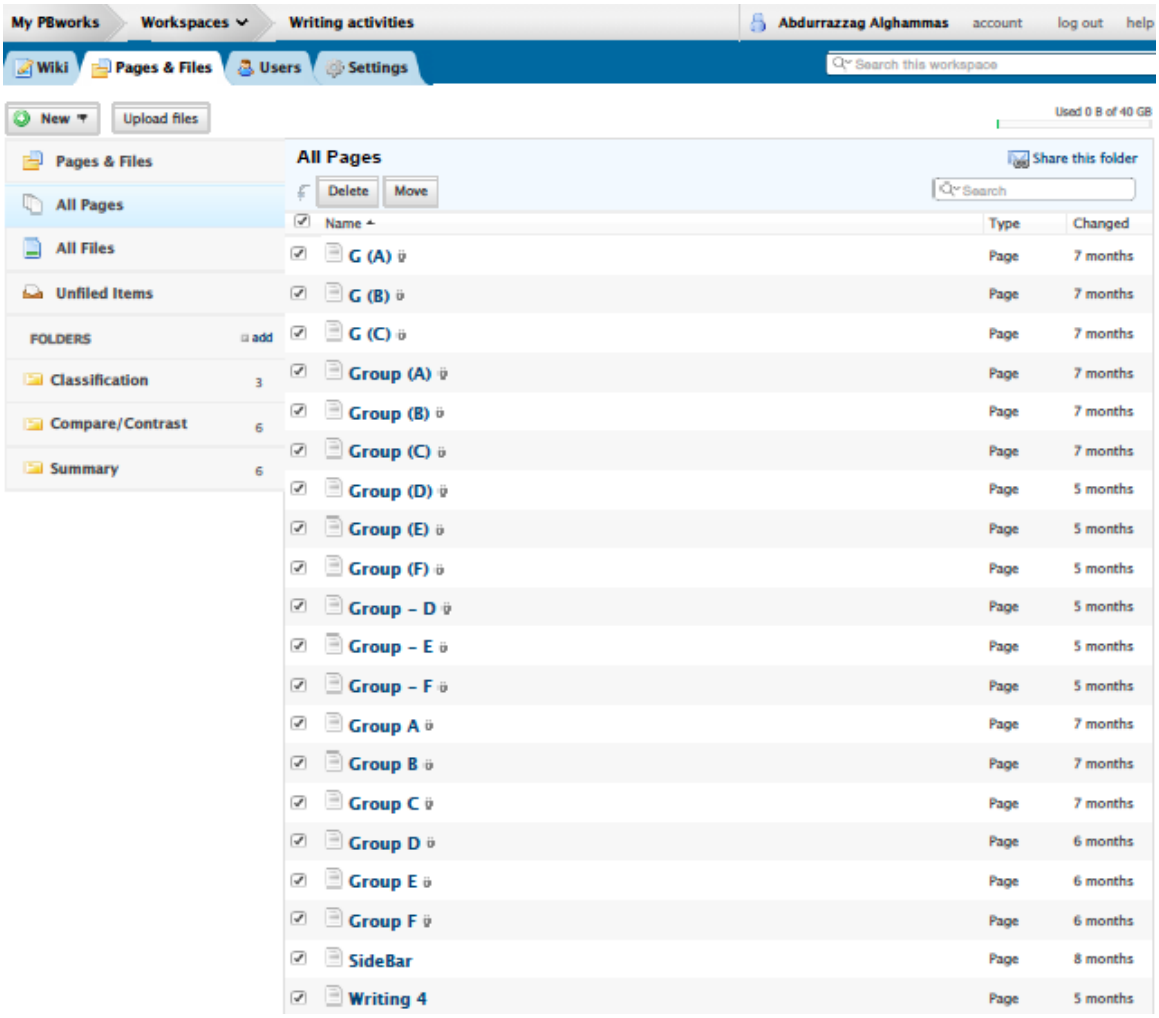


Figure 3. The class wiki and groups' pages.

Wiki Writing Tasks

One of the main objectives of this study was to explore how small groups of students interacted to complete three different wiki-based writing activities. Groups collaboratively completed summary, comparison/contrast, and classification paragraphs on the class wiki. For each paragraph, groups spent about one week responding to the writing prompt. The three writing prompts were chosen by the writing instructor to match the syllabus design and meet the course objectives. The writing assignments were taken from different sources such as *Great Writing 3: From Great Paragraphs to Great Essays*

(Folse, Solomon, & Clabeaux, 2007), *LEAP: Learning English for Academic Purposes* (Beatty, 2012), and the novel *Holes* (Sachar, 2008). It is worth noting that students at the intermediate level are exposed to different writing types in order to improve academic writing skills. Figure 4 shows the sample of writing prompts given to groups.

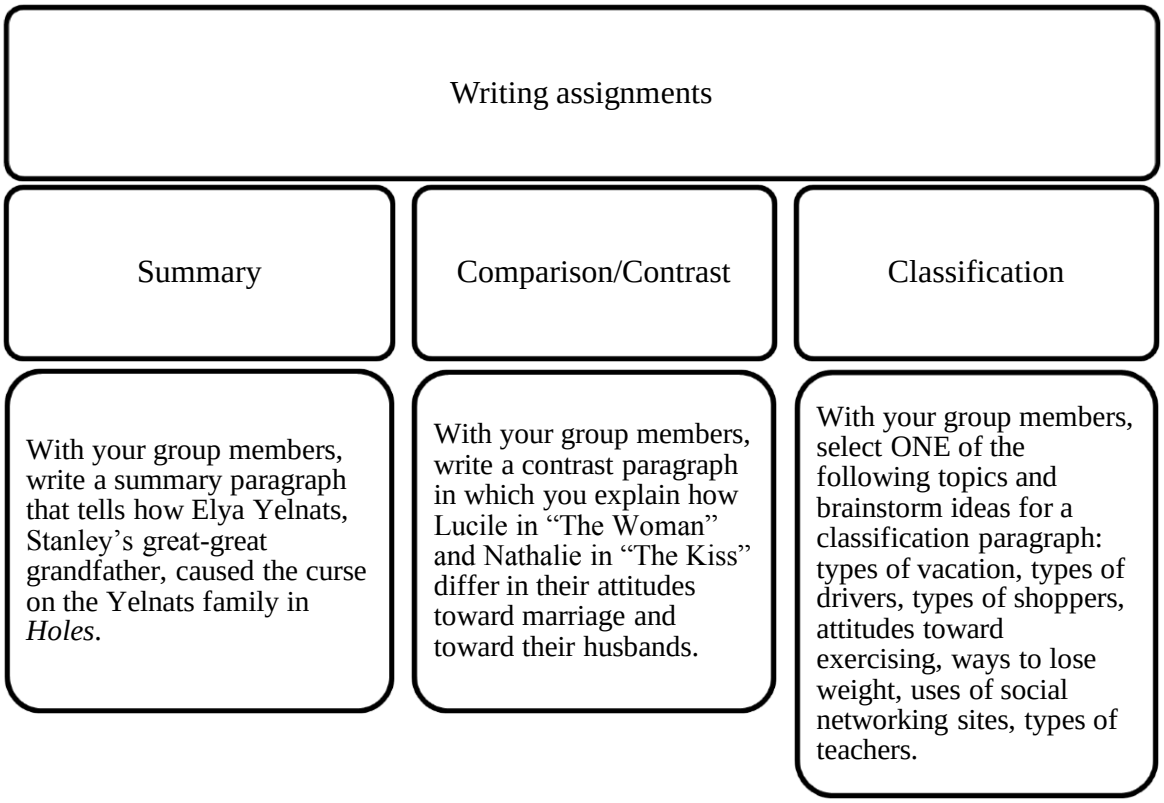


Figure 4. Writing tasks.

Researcher's Role

My renewed interest in integrating modern technology in L2 learning and my experience in using social networks in language teaching motivated me to continue the line of inquiry in wiki-based collaborative learning. In this study, my primary role was as an observer, and I did not choose the wiki-based writing activities. I designed the class wiki, introduced participants to the wiki, and posted the writing assignments on the wiki

site. Being technologically proficient, I served as a technical consultant to provide help when participants encountered a technical issue.

My role was primarily as an outside observer, so I never participated in the wiki discussion with students or commented on the writing assignments. Throughout the study, I worked closely with the writing instructor to successfully collect the data. While I focused on the technical side of the data collection, the writing instructor grouped students and rotated them for every activity, assigned writing activities, and encouraged students to participate. Previous wiki-related studies (e.g., Carr et al., 2007; Lin & Kelsey, 2009) confirmed that assigning students into groups is best determined by writing instructors to ensure diversity.

As this study was designed to explore interaction within groups and not between groups, the participants were given an opportunity to interact with different peers and had different group dynamics prior to each writing task. The writing instructor purposely implemented the strategy of rotating groups to avoid the problem of social loafing (i.e., unequal participation). The problem of unequal participation occurred in some studies such as Arnold, Ducate, and Kost's (2009), who reported that several students complained about unequal participation and poor communication within their groups. However, it is worth mentioning that the harmony between the writing instructor and the researcher facilitated the data collection process.

Data Collection Procedure

The data were collected over two subsequent sessions (spring and summer 2015) for 8 weeks each. In the mixed-methods approach, researchers frequently use one of four designs: explanatory, exploratory, triangulation, or embedded (Ivankova & Creswell,

2009). This study adapted the triangulation design because both quantitative and qualitative data were collected simultaneously. The importance of the triangulation process, as pointed out by Creswell, Plano Clark, Gutmann, and Hanson (2003), lies in the fact that concurrently collecting quantitative and qualitative data to compare and contrast findings leads to well-validated conclusions. Johnson (1991) further confirmed that triangulating data "reduces observer or interviewer bias and enhances the validity and reliability of the information" (p. 146).

Upon receiving Institutional Review Board (IRB) approval (see Appendix B) to collect the data, the researcher coordinated with the writing instructor to determine the best way to collect the data so as not to interrupt the flow of the classroom. The process began with an introductory and training session in the computer lab for approximately 60 min. During this informative session, three objectives were achieved. First, I introduced the basics of wikis through video clips (e.g., Wikis in Plain English; https://www.youtube.com/watch?v=-dnL00TdmLY) and showed the homepage of the class wiki (www.eslcomposition.pbworks.com) and how to navigate through pages. Second, I helped students create usernames and personal passwords to access the private class wiki around the clock. Third, I gave students a mock writing assignment and allowed every student to try out the wiki and make sure no one had a technical problem. At the end of the session, I answered different questions concerning the data collection process. Previous researchers on wikis emphasized the significance of training students on wikis before they start writing. For example, Cowan and Jack (2011) pointed out that training students via wiki-based tutorials improves student ratings of wiki usability.

Zheng et al. (2015) confirmed, “Explaining and modeling rules of wiki etiquette cannot be forgotten in implementing wiki projects” (p. 6).

Instruments

As this study follows the triangulation design in a mixed-methods approach, different data collection instruments were used, including the following: the presurvey questionnaire, closed-ended items, open-ended responses, and the wiki history records. The following sections shed light on the instruments employed and how they were implemented.

Questionnaires. One of the best-known methods for collecting data in social sciences is the questionnaire. Dörnyei (2003) confirmed that questionnaires are the most employed data collection devices in statistical research. Questionnaires are described by Brown (2001) as “any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers” (p. 6).

After obtaining permission to use similar questionnaire items (see Appendix C) from Li (2014), an author of a recent related study, I adapted and modified the survey items to match the objectives of the study. Qualtrics—an online survey website—was used to administer questionnaire surveys. The questionnaire comprised pre- and post-questionnaire surveys (see Appendix D). Questions in the prequestionnaire survey collected participants’ background information such as prior English learning experience, prior technology experience (including wiki), preference of work style, and the degree of familiarity with group members, whereas the postquestionnaire survey involved both closed- and open-ended responses.

Closed-ended statements. There were sixteen 5-point Likert scale items on the postquestionnaire survey. The scale included *Strongly agree*, *Agree*, *Neither agree nor disagree*, *Disagree*, and *Strongly disagree* choices. Although the primary objective of the postquestionnaire was to get students' general attitudes on wiki-based writing, the questionnaire items were grouped into four separate categories to get a better understanding of students' perceptions and interaction in wiki-based activities. The four categories include collaborative writing, academic writing, writing tasks, and participation.

Open-ended questions. The postquestionnaire survey included four open-ended questions, which required students to freely and openly express their attitudes toward the wiki-based writing. Not only did open-ended responses permit "greater freedom of expression" (Dörnyei, 2007, p. 107), but they also allowed the researcher to ask questions in both closed- and open-ended formats to confirm the results. Oppenheim (1992) stated that it is a good idea to ask the same question in both an open and closed format. The four questions tried to get a better idea of students' general perspectives on the wiki-based activities and further explored some challenges students encountered in the online collaborative writing. According to Brown (2009), "Open-response questionnaires provide a way to find out, in an unstructured manner, what people are thinking about a particular topic or issue" (p. 201).

Wiki history records. The six groups of participants completed the three writing activities assigned by the teacher on the class wiki. One of the fundamental tenets of the class wiki site is the built-in history log (archive). This feature helped the researcher to observe all edits made by every single participant because all edits are saved

automatically by name, time, and date. It is worthwhile to note that little wiki-related research depended on history records to monitor students' interaction in wiki-based writing (Hadjerrouit, 2014). Zheng et al. (2015) also confirmed that history pages are valuable for monitoring student participation. Using the version comparison feature, I was able to manually quantify the number of edits that students in small groups made. More specifically, comparing versions of each group provided answers concerning the type of participation and the effect of tasks on group interaction in the class wiki.

Data Analysis Procedure

Different data analysis options are used in mixed-methods studies. The selection of one option over another depends on various factors such as the design of the data collection method, the research questions, and the main objectives of the study. Because this study followed the triangulation design in the data collection phase, the comparison approach was employed during data analysis to compare the results of both quantitative and qualitative methods. In other words, results of quantitative and qualitative measures were thoroughly examined to check if they converged or showed divergence. According to Ivankova and Creswell (2009), "The most popular approach is to compare the quantitative results and qualitative findings to confirm or cross-validate the findings from the entire study" (p. 142).

As far as the quantitative measures were concerned, descriptive statistics were used to summarize the survey items. Gathered data were analyzed using IBM SPSS Statistics (Version 23.0). To provide some answers to Research Questions 1, 3, and 4 (i.e., the quantitative research questions), descriptive statistics were computed on individual survey items and also on scale dimensions. These included the following: response

frequencies, means, standard deviations, and response percentage. The statistical analysis was entirely based on the predetermined set of four categories: collaborative writing, academic writing, writing tasks, and students' participation in the class wiki.

For the qualitative part, content analysis was used to provide an answer to Research Question 2 and figure out the type of participation in the wiki-based writing (i.e., addition and deletion). With the help of two Ph.D. students, I compared all wiki history versions of each group through manual analysis to recognize the type of editing. Two coding categories were adapted to classify *form-related changes* (FRCs) and *meaning-related changes* (MRCs): Kessler (2009) and Kessler and Bikowski (2010), respectively (Tables 2 and 3). The FRC and MRC categories were used to explore the role of writing tasks on students' attention when they collaboratively completed the writing activities.

Table 2

Coding Category for the Form-Related Changes Items with Descriptions. Adapted and Modified from Kessler (2009)

Coding Category	Description of Category
Articles	Student adds/changes the article of a noun.
Coordination	Student changes/adds a coordinating conjunction to a sentence.
Fragment	Student revises a fragment in a written sentence.
Part of speech	Student changes the form of a word.
Punctuation	Student adds/changes the caption of a letter.
Spelling	Student changes the spelling of a word.
SVA	Student changes the subject or the verb of the sentence to maintain subject-verb agreement.
Word choice	Student changes a word another student has used.
Preposition	Student adds/changes a preposition in a sentence.

Table 3

Coding Category for the Meaning-Related Changes Items with Descriptions. Adapted from Kessler and Bikowski (2010)

Coding Category	Description of Category
New information	Student writes about a subtopic not previously discussed.
Deleted information	Student deletes information, ranging from one word or piece of punctuation to the entire body of the wiki.
Clarification/elaboration of information	Student adds to a subtopic that had already been introduced.
Synthesis of information	Student writes a sentence or paragraph that ties together previously written information.
Link	Student adds a link.

Table 4 presents an overview of the data analysis procedure in relation to the triangulated data sources and the set of research questions.

Table 4

Overview of the Data Analysis

Research Questions	Focus	Data Sources		Data Analysis Procedure
		Primary	Secondary	
Q1	Participation in group writing	Class wiki	Questionnaires	History logs, descriptive statistics
Q2	Type of participation	Class wiki	N/A	Content analysis
Q3	Effect of tasks on FRCs and MRCs	Class wiki	Questionnaires	Content analysis, descriptive statistics
Q4	General attitudes	Questionnaires	Open-ended responses	Descriptive statistics and content analysis

Ethical Consideration

The privacy of the participants was strictly observed, and the information they provided was used only for the purposes of the research study. In dealing with the participants, I followed the regulations of the IRB at the university where the study was conducted (see Appendix E for informed consent form). Regarding the informed consent form, I ensured that all participants comprehended the form and understood the nature of the study. Above all, students were given 1 day to consider whether they would like to participate in this study or not, and they were informed of the voluntary nature of the participation and the freedom to withdraw from the study if they wanted to.

What is more, the participants' identities were protected. The class wiki site was private, making it invisible to the public. The participants were given the opportunity to use real names or pseudonyms on the class wiki, as they were in the same English level and had the same writing instructor. It is also worth noting that students did not provide any personal details on the class wiki; they only collaborated to complete the writing activities. To ensure data confidentiality, I kept all data in a private place (i.e., personal locker(s) at home and on my personal computer under strict supervision), and the class wiki was encrypted using a password. During the data analysis phase, I gave the total weight to the data and tried to avoid imposing my beliefs and bias on the data.

However, two issues came up in the data collection phase. First, a technical glitch occurred after the participants completed the postquestionnaire survey. Nineteen responses on the postquestionnaire survey were collected instead of eighteen, which means one student completed the survey twice. It was beyond my control to pinpoint the duplication although I contacted the Qualtrics support team. However, upon consultation

with a statistician, I confirmed that the duplication did not negatively impact the data analysis. Second, three out of six groups completed the classification paragraph because students in the second semester (spring 2015) were not presented with this type of academic writing. However, this did not affect the data analysis because the comparison was made within groups and not between groups.

After giving a full description of the research methodological approach I implemented in this study to explore ESL students' interaction and attitudes toward wiki-based writing, I present the key findings of the study in the following chapter. The chapter provides the analysis results of the quantitative and qualitative measures that were used in the data collection process. The reporting of the results is carried out through the lens of the aforementioned predetermined four categories.

Chapter 4

Results

This chapter presents the key findings of the data analysis process. The chapter is divided into two main sections: quantitative and qualitative. Whereas the former shows the results of the pre- and post-questionnaire surveys, the latter presents the findings of the class wiki and open-ended response analysis. As far as the surveys are concerned, the presentation of the findings is completely shown through the lens of the four predetermined categories: collaborative writing, academic writing, writing tasks, and participation. In the qualitative section, the results are presented through the lens of the main research questions.

Quantitative Results

By using the questionnaires, I tried to elicit participants' general perspectives on wiki-based collaborative writing. The prequestionnaire survey was used to get students' experience and perspective on learning English, the amount of time and purpose of using computers, previous background in wiki-based writing, and attitudes toward individual and group work in class. The postquestionnaire survey was grouped into the above-mentioned four categories to get a fuller understanding of the potential of wikis in L2 writing classes. Table 5 presents students' responses and frequencies to the prequestionnaire survey.

Table 5

Presurvey Responses and Frequencies of Students' Background in Learning English and Computer Use

Item	Very Positive (%)	Positive (%)	Neutral (%)	Negative (%)	Very Negative (%)
Experience of learning English	7 (38.9)	7 (38.9)	4 (22.2)	0	0
Attitude toward individual work	4 (22.2)	10 (55.6)	4 (22.2)	0	0
Attitude toward group work	3 (16.7)	11 (61.1)	3 (16.7)	0	1 (5.6)
Daily h of computer use	*M*: 2.39	*SD*: 2.32			
Purpose of computer use	Study: 11 (61.1%)	Fun: 10 (55.6%)	Social network: 9 (50%)		
Past wiki experience	Yes: 0	No: 18 (100%)			

To get a better understanding of students' objectives in learning English, students were given a general question in the presurvey: "What are your goals of learning English?" After analyzing students' responses, two main reasons emerged: to improve language skills, and to enroll in a university to get a graduate degree (see Appendix F for complete responses). Because students clearly set their goals of learning English, the majority of them (77.8%) have had positive experience in learning English, though their exposure to the English language is comparatively short (M = 3.91 years) as Table 5 shows. In terms of computer use, students were given three choices to identify the main purpose of using the computer—namely, study, fun, and social networking. Whereas students could pick all that apply to their needs, using computer for study (61.1%) is slightly higher than the other two choices. To check students' background in Web 2.0 applications, students were given the prompt "Describe your experience in using other Web 2.0 tools." Based on the available data, quite a large number of students is

acquainted with blogs, Facebook, and Twitter (see Appendix G). Strikingly, none of the students (0%) had any experience in wiki-based writing and thus had not been introduced to wikis before. Most relevant to the study's aims are the two questions assessing participants' attitudes toward individual and small group work. The mean score for "Your attitude toward individual work is..." is 2.00 (*SD* = 0.69), whereas the mean for "Your attitude toward small group work is..." is 2.17 (*SD* = 0.92), suggesting that at presurvey, participants had slightly more positive views toward group work than individual work.

In terms of the postsurvey, it is relevant to note that some assumptions were made when obtaining the results for each category. Such assumptions were made because the exploratory factor analysis was not used to look at how each item is grouped to obtain each category. This assumption is relevant because the sample size is small, and the intent of this survey is to give a description of the participants' perspectives and/or attitudes regarding wiki-based collaborative writing activities. Table 6 shows the items that were combined to obtain each of the four categories.

As stated above, the postsurvey was designed to fully recognize students' attitudes toward wiki-based writing in terms of the four predetermined categories. Tables 7, 8, 9, and 10 present the frequencies of students' responses to the items pertaining collaborative writing, academic writing, writing tasks, and participation, respectively.

Table 6

The Four Predetermined Categories Grouping

Categories	Items
Collaborative writing	1. I enjoyed using wikis for collaborative writing. 2. I preferred doing collaborative writing on wikis to writing individually.
Academic writing	3. Wiki-based collaborative assignments improved my writing skills. 4. Wiki collaborative writing helped me attend to content development. 5. Wiki collaborative writing helped me attend to language use. 6. Wiki collaborative writing helped me attend to essay structure/organization. 8. I enjoyed the revision process in the wiki.
Writing tasks	7. I was able to use the genre knowledge we learned in class to respond to the assignments posted on the wiki. 9. My degree of participation varied during the three wiki assignments. 16. All my group members contributed to the wiki tasks equally.
Participation	10. My group engaged in discussion using the wiki. 11. My group often discussed the writing assignment outside the wiki (e.g., in face-face conversations, emails, online chat, etc.). 12. I was able to make important contributions to the wiki-based writing assignments. 13. I think my group members valued my contribution. 14. I valued the ideas and help my group brought to the wiki activities. 15. My group members agreed on final drafts easily.

Table 7

Attitudes Regarding Collaborative Writing

Item	Strongly Disagree (%)	Disagree (%)	Neither (%)	Agree (%)	Strongly Agree (%)	*M*	*SD*
1.	0 (0)	0 (0)	2 (10.5)	9 (47.4)	8 (42.1)	4.32	0.67
2.	1 (5.3)	1 (5.3)	5 (26.3)	5 (26.3)	7 (36.8)	3.84	1.17
Total	1 (3)	1 (3)	7 (18)	14 (37)	15 (39)	4.08	0.80
14. (Presurvey)	1 (6)	0 (0)	3 (17)	11 (61)	3 (17)	3.83	0.92

Table 8

Wikis and Academic Writing

Item	Strongly Disagree (%)	Disagree (%)	Neither (%)	Agree (%)	Strongly Agree (%)	*M*	*SD*
3.	0 (0)	0 (0)	3 (15.8)	11(57.9)	4 (21.1)	4.06	0.64
4.	0 (0)	0 (0)	2 (10.5)	12 (63.2)	5 (26.3)	4.16	0.60
5.	0 (0)	0 (0)	2 (10.5)	11(57.9)	6 (31.6)	4.21	0.63
6.	0 (0)	0 (0)	1 (5.3)	11(57.9)	7 (36.8)	4.32	0.58
8.	0 (0)	0 (0)	1 (5.3)	11(57.9)	7 (36.8)	4.32	0.58
Total	0 (0)	0 (0)	9 (10)	56 (60)	29 (31)	4.21	0.43

Table 9

Wikis and Writing Tasks

Item	Strongly Disagree (%)	Disagree (%)	Neither (%)	Agree (%)	Strongly Agree (%)	*M*	*SD*
7.	0 (0)	0 (0)	4 (21.1)	6 (31.6)	9 (47.4)	4.26	0.81
9.	1 (5.3)	3 (15.8)	1 (5.3)	8 (42.1)	6 (31.6)	3.79	1.23
16.	0 (0)	1 (5.3)	1 (5.3)	9 (47.9)	8 (42.1)	4.26	0.81
Total	1 (2)	4 (7)	6 (11)	23 (40)	23 (40)	4.11	0.67

Table 10

Participation in Wiki-Based Writing Activities

Item	Strongly Disagree (%)	Disagree (%)	Neither (%)	Agree (%)	Strongly Agree (%)	*M*	*SD*
10.	1 (5.3)	1 (5.3)	5 (26.3)	7 (36.8)	5 (26.3)	3.74	1.10
11.	1 (5.3)	2 (10.5)	1 (5.3)	10 (52.6)	5 (26.3)	3.84	1.12
12.	0 (0)	1 (5.3)	1 (5.3)	10 (52.6)	7 (36.8)	4.21	0.79
13.	0 (0)	0 (0)	2 (10.5)	12 (63.2)	5 (26.3)	4.16	0.60
14.	0 (0)	0 (0)	1 (5.3)	12 (63.2)	6 (31.6)	4.26	0.56
15.	0 (0)	0 (0)	3 (15.8)	8 (42.1)	8 (42.1)	4.26	0.73
Total	2 (2)	4 (4)	13 (11)	59 (52)	36 (32)	4.08	0.59

As can be seen in Table 7, most of the participants (76%) reported that they enjoyed and preferred using wikis for writing activities, about 6% disagreed, and approximately 18% were undecided. Additionally, the descriptive statistics are provided for items assessing enjoyment of and preference for collaborative writing using wikis (Items 1 and 2), as well as participants' attitudes toward small group work (Item 14, assessed at presurvey). The mean of Items 1 ("I enjoyed using wikis for collaborative writing") and 2 ("I preferred doing collaborative writing on wikis to writing individually") is 4.08 (*SD* = 0.80), indicating that participants felt positively about the collaborative assignments. In comparison, the mean of Item 14 of the presurvey, "Your attitude toward small group work is..." is slightly lower at 3.83 (*SD* = 0.92). Although the wording of the items differs, and direct comparisons between items must therefore be made with caution, the results suggest wiki-based collaborative writing assignments were rated slightly higher than small group work in general.

Table 8 presents Items 3, 4, 5, 6, and 8 assessing perceived helpfulness of wiki-based writing in academic writing. The mean for all the items is 4.21 (*SD* = 0.43), indicating that participants overall believed that wiki-based writing helps students polish academic writing skills. Item 3, "Wiki-based collaborative assignments improved my writing skills" (*M* = 4.06, *SD* = 0.64), has the lowest mean, whereas the highest mean is shared by two items: "Wiki collaborative writing helped me attend to essay structure/organization" (Item 6; *M* = 4.32, *SD* = 0.58), and "I enjoyed the revision process in the wiki" (Item 8; *M* = 4.32, *SD* = 0.58). To get a fuller picture about students' attitudes toward wikis and academic writing, *strongly agree* and *agree* responses were combined to obtain agreement, and *strongly disagree* and *disagree* were also collapsed to

get disagreement. By doing so, it can be said that about 90% of students agreed that the use of wikis in their writing assignment improved their overall academic writing skills such as language use, essay structure and organization, and content development. Strikingly, none of the participants (0%) disagreed with this; however, about 10% were silent on whether it improved their academic writing skills.

As can be seen in Table 9, students' responses concerning completing three different tasks on the class wiki are varied. Whereas Item 9, "My degree of participation varied during the three wiki assignments" (M = 3.79, SD = 1.23), has the lowest mean, both Item 7, "I was able to use the genre knowledge we learned in class to respond to the assignments posted on the wiki," and Item 16, "All my group members contributed to the wiki tasks equally," share the highest mean (M = 4.26, SD = 0.81). However, the total of students' responses confirms that the majority of students (80%) agreed that the use of wiki-based writing assisted them in their writing tasks, whereas 11% were undecided and 9% expressed disapproval.

Table 10 shows the descriptive statistics for each item assessing participation in the wiki-based writing activities as well as the total for the combination of all 6 items (10–15). Across the 6 items, "My group engaged in discussion using the wiki" (Item 10) has the lowest mean of 3.74 (SD = 1.10). The highest mean is shared by 2 items: "I valued the ideas and help my group brought to the wiki activities" (Item 14; M = 4.26, SD = 0.56), and "My group members agreed on final drafts easily" (Item 15; M = 4.26, SD = 0.73). Thus, participants were in consensus that during the wiki activities, group members were agreeable and contributed effective ideas. Across all 6 items, the mean was 4.08 (SD = 0.59), indicating that the majority of students were in agreement with all

items. Not only were students in a high percentage of agreement but also the majority of participants (84%) was positive that wiki-based writing improved their level of participation and interaction in group writing work.

Overall, the quantitative results show that the majority of the students' attitudes toward the use of wikis as a writing tool are positive and encouraging. The results why they found it useful are presented in the following section along with the type of interaction students had on the class wiki.

Qualitative Results

In this section, the findings of the class wiki content and open-ended responses are presented. Because this study used the triangulation mixed-methods design, the wiki data were quantified for frequencies of occurrences to make the presentation of results easy and the comparison between quantitative and qualitative findings feasible. To deeply recognize why students held their perspectives toward wiki-based activities, the four open-ended questions are summarized, and some students' responses are given. More significantly, the key findings of this section are organized around the main research questions.

Table 11 gives an idea about the extent to which students in small groups participated in the class wiki (Research Question 1). Whereas Table 12 presents the type of participation small groups made (Research Question 2), Tables 13, 14, and 15 show the frequencies and categories of FRCs and MRCs groups focused on in all three wiki-based activities (Research Question 3).

Table 11

Groups' Participation Frequency in Wiki-Based Writing Activities

Type	Summary # of revisions	Comparison/Contrast # of revisions	Classification # of revisions
Group A	22	6	12
Group B	10	5	2
Group C	3	6	7
Group D	6	14	n/a
Group E	11	9	n/a
Group F	13	7	n/a
Total	65	47	21

Table 12

Frequency of Type of Participation

Type	Summary	Comparison/Contrast	Classification	Total
Addition	286	219	78	583
Deletion	265	199	50	514

Table 13

Frequency of Effect of Tasks on Form-Related Changes (FRCs) and Meaning-Related Changes (MRCs)

Type	Summary	Comparison/Contrast	Classification	Total
FRCs	199	163	44	406
MRCs	82	63	52	197

Table 14

Categories and Frequencies of Form-Related Changes (FRCs)

Type of FRC	Summary	Comparison/Contrast	Classification	Total
Punctuation	34	19	3	56
Coordination	22	25	4	51
Spelling	26	15	7	48
Word choice	17	20	8	45
Tense	20	14	2	36
Unnecessary word	13	19	3	35
Articles	11	18	3	32
Capitalization	21	6	3	30
Word order	16	6	0	22
Preposition	9	5	2	16
Part of speech	3	8	3	14
Singular/plural	1	4	5	10
Subject-verb agreement	4	3	1	8
Fragment	1	1	0	2
Verb form	1	0	0	1
Total	199	163	44	406

Note. Italics indicate emerging types in the current study.

Table 15

Categories and Frequencies of Meaning-Related Changes (MRCs)

Type of MRC	Summary	Comparison/Contrast	Classification	Total
Clarification/elaboration of information	36	29	18	83
Synthesis of information	14	11	24	49
New information	13	8	4	25
Word choice	7	12	5	24
Deleted information	12	2	1	15
Link	0	1	0	1
Total	82	63	52	197

Note. Italics indicate emerging types in the current study.

As can be seen in Table 11, groups made a number of revisions and edited the wiki pages frequently on all three assignments. Based on the writing task, the number of revisions is not the same. Across the 6 groups, the summary activity has the highest total with 65 revisions. Whereas the classification task is the lowest with 21 revisions, the comparison/contrast assignment comes in the middle with 47 revisions. The table also shows that the participation of every group on the three tasks is not equal. In the summary assignment, Group A participated the most (22), whereas Group C made the fewest revisions (only 3). By looking at the comparison/contrast assignment, it is obvious that Group D had the highest number of revisions (14), and Group B had the lowest number of revisions (5). For the classification assignment, Group A made 12 revisions as the most edited page, and Group B made only 2 revisions as the least visited page.

However, the comparison among groups' participation is beyond the scope of this study because the study focuses on the interaction within groups and not between groups. Another important factor that led to the difference in participation is that groups are not fixed, but rotated for every assignment.

After looking in-depth into the revisions made by all groups, it can be noticed that groups focused on adding information more than deleting information. Table 12 shows the total number of additions (583) is higher than the total number of deletions (514). Interestingly, the difference between additions and deletions is not huge. The number of differences in the summary, comparison/contrast, and classification assignments are 21, 20, and 28, respectively.

Recognizing the type of participation per se is not sufficient to fully understand how groups interacted in the three writing assignments. Thus, the following tables present

whether groups' revisions were related to form or to meaning. What is more, the specific categories of form-related or meaning-related changes are given in detail.

Table 13 shows the effect of writing tasks on groups' attention, and the number of FRCs and MRCs in each writing assignment. With a total of 406 changes, it is obvious that groups paid more attention to form than to meaning, which has only 197 changes. However, by investigating each assignment separately, it can be seen that the total FRCs to the total MRCs in both the summary and comparison/contrast assignments is slightly more than double with 199:82 and 163:63, respectively. On the contrary, groups focused on meaning more than form in the classification assignment with a marginal increase of 52:44. As a significant variable, the writing task had an effect on groups' attention when responding to the writing assignments. Not only does the table show the effect of task on groups' attention, but also it indicates that the number of changes either form-related or meaning-related is not similar in the three assignments.

Equally important to the form-related and meaning-related changes is the category of each type. Tables 14 and 15 present the categories and frequencies of FRCs and MRCs, respectively. It is worth reiterating that Kessler's (2009) FRC coding category and Kessler and Bikowski's (2010) MRC coding category were adapted and modified to classify the key findings of this study.

Table 14 presents the frequencies of each category related to the form or structure. As can be seen above, punctuation was the most frequently edited type with a total of 56 times across all writing assignments. Punctuation includes, but is not limited to, periods, quotation marks, and question marks. On the opposite side of the spectrum, verb form was the least edited form-related type with a total of only 1. Although it occurred once,

this classification cannot be overlapped with spelling, because a participant picked the correct tense but the verb was written incorrectly. The only example was that a participant wrote the past tense of "find" as "*finded*" instead of "found."

To make the presentation simple, the 15 categories above are divided into three distinct blocks—high, middle, and low—based on the total number of edits. The high frequency includes coordination, spelling, and word choice, which were edited more often with a total of 51, 48, and 45, respectively. Tense, unnecessary word, article, and capitalization were edited frequently with a total of 36, 35, 32, and 30, respectively. The low frequency block includes word order, preposition, part of speech, singular/plural, subject-verb agreement (SVA), and fragment with totals 22, 16, 14, 10, 8, and 2, respectively.

To link the effect of writing task on groups' collaborative writing, it is worth looking at the most and least frequent categories in each writing assignment. In the summary assignment, groups focused on punctuation as the most frequent category (34 times), but singular/plural, fragment, and verb form came at the bottom with 1 time each. Coordination attracted groups' attention in the comparison/contrast task as the most frequently edited category (25 times), but fragment rarely attracted groups' attention (1 time). Although three groups completed the classification assignment, it is clear the groups focused on word choice as the most frequent category (8 times); however, the category SVA was rarely edited (1 time only). Examples of FRC frequent categories are shown in Figure 5.

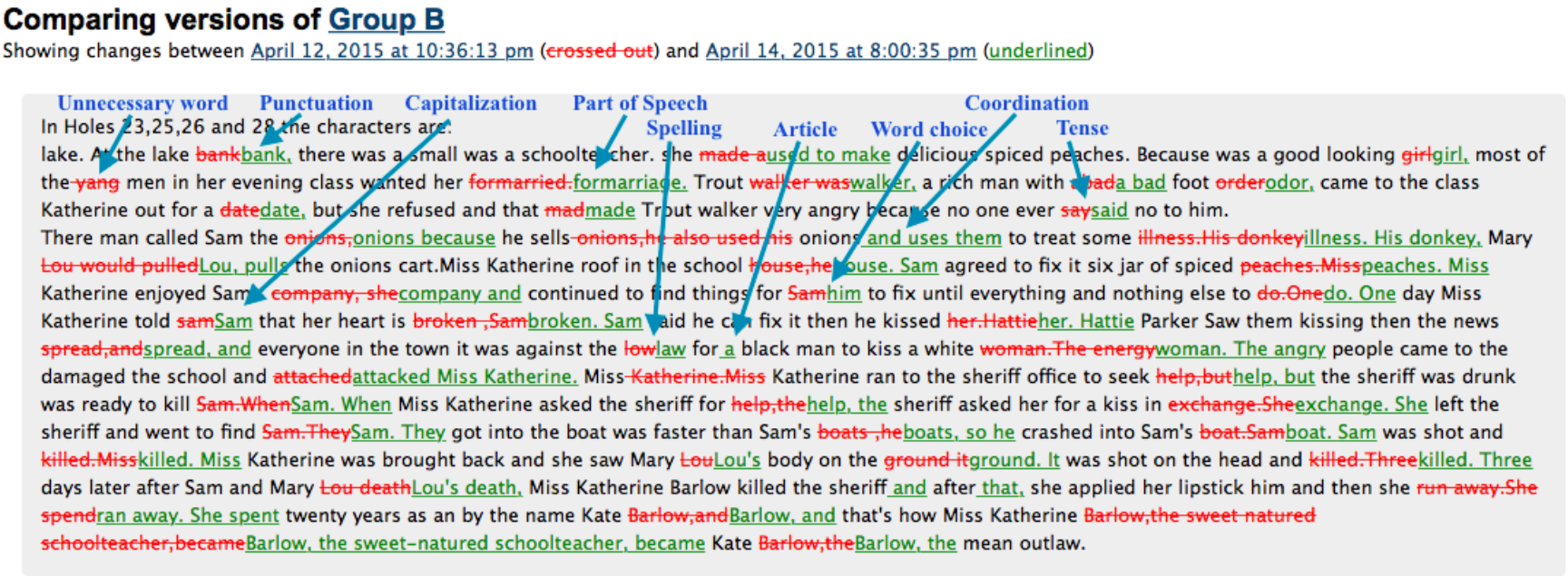


Figure 5. Examples of FRC categories.

Table 15 highlights the categories and frequencies related to the meaning changes. Across the three writing assignments, clarification/elaboration of meaning was the highest category with a total of 83 times. Synthesis of information in which a participant added a sentence or a few sentences that tie together previously written information came second with a total of 49 times. Groups focused on about the same number of changes related to new information and word choice. It is significant to note that word choice category in the MRCs are strongly related to meaning changing and not synonymy as in the FRCs above. It can be noted from the table that groups rarely deleted information other peers wrote (15 times). Although groups were not required to add supplementary information other than responding to the writing prompts, the data show that one link was added on the class wiki to help a group answer the designated comparison/contrast prompt.

Investigating MRCs for each separate task, the clarification/elaboration of information was the highest category in the summary and comparison/contrast assignments with 36 and 28 changes, respectively, but the synthesis of information was the highest in the classification assignment (24 times). In contrast, word choice was the least edited category in the summary task (6 times), and almost the same number of deletions occurred in the comparison/contrast and classification tasks as in the least edited category. Figure 6 shows one revision sample that includes almost all the MRC categories.

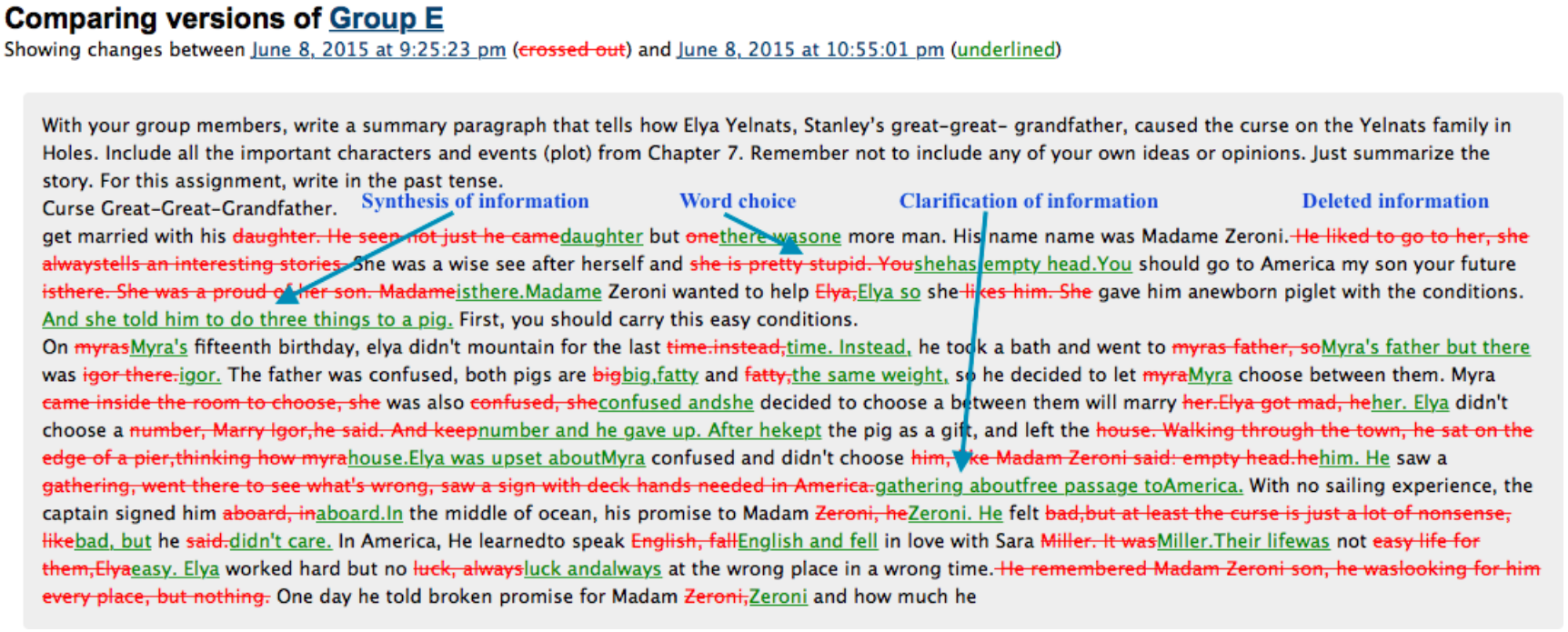


Figure 6. Examples of MRC categories.

Open-Ended Responses

Based on the quantitative findings above, students' overall attitudes toward wikis in writing classes are positive. However, perspectives were collected not only through the survey, but also through four open-ended questions to elicit the reasons from students behind such attitudes. To get a complete answer to Research Question 4, the key findings of the four open-ended questions are presented below. To substantiate the answer to each question, some samples of students' responses are provided. See Appendix H for complete students' responses to the four open-ended questions.

Students' responses to the question "What is your overall impression of small group writing using wikis?" were generally positive. For example, one student stated, "I can see other members' writing immediately. It is good to be able to check which parts they modified." Another one said, "I think that in general wiki could be useful tool for reading and writing class. Small group of people help to achieve the goals…." However, very few responses carried negative feelings; for instance, one student explicitly expressed his/her style of learning by saying, "I prefer individual." Another one mentioned, "I didn't like it that mach [sic] because there are some of them they don't like to work. So I will be stuck with them." To ensure interrater reliability, two experts in the field of ESL agreed with the researcher on positive/negative judgment on students' responses.

The second question was "What did you like about writing in small groups using wikis?" Students gave different reasons for liking wiki-based writing. Those reasons can be grouped into four main themes, which evolved from the data set: sharing ideas/scaffolding, communication, limitless time, and editability. For examples of

responses related to sharing ideas and scaffolding, a student admitted, "I like to see how poeple wrtie [sic] because I think it is helpful to learn writing. Also, I like to see the mistakes they make to avoid it." Another student stated, "I like that every one could write and help each other." Yet another student wrote, "Writing these paragraphs with my friends." Explicitly stated, one respondent liked the wiki-based writings because he or she was able to "share ideas." In terms of communication, one student clearly said that wiki-based collaborative writings allowed him or her to "better to communicate" with other members in the group. For the flexibility of wikis, a student confirmed, "I did my work at any time and in any place." Another participant said, "Thanks to Wiki, I can work with members even at home. And I don't have to wait for members' writing to end." As a salient feature of wikis, editability attracted several students. One student confirmed, "It good because the group can add or remove ideas whenever they need to make some changes." Another response was: "I can fix the paragraph it easily and I can check what they fixed and what I did wrong."

Students were asked not only about the reasons for liking wikis, but also reasons behind disliking wikis. By asking students "What did you NOT like about writing in small groups using wikis?," several participants reported nothing. However, a few responses related to unequal participation, disagreement, initiation, and technical issues emerged from the data set as main themes. The first three themes were reported only one time: "some people did not work," "It is confusing and a lot of disagreeing," and "who will start" are examples. Based on the available responses, it can be said that some technical-related issues were disappointing. For example, one student stated, "I didn't

like that some times when I open it I find it used by someone." Another one wrote, "Probably, I did not like that the system is close when other one is writing the paragraph."

Whereas the above three open-ended questions present students' overall attitudes toward wiki-based writing from different dimensions, the last open-ended question, "What suggestions would you like to add to make wiki-based collaborative writing assignments more effective for ESL students?," was given to obtain students' practical suggestions based on their participation in the current study. The data show that a great number of students strongly suggest integrating wikis into different writing courses. Some students' examples are as follows: "Include wiki as part of homework," "I think that to do more information about Wiki in all levels," and "If it is proyect [sic] can be with every leves [sic] in IEI." A few suggestions were also given but were not strongly relevant to the question such as adding technical-related features and offering writing guidance.

After presenting the key results of quantitative and qualitative data in this chapter, the next chapter is completely devoted to the discussion and interpretation of results, the conclusion of the study, and suggestions for future research. The discussion of results is organized around the set of research questions and linked to previous related studies.

Chapter 5

Discussion, Conclusion, Limitations, and Recommendations for Future Studies

This chapter encapsulates five main sections that lead the reader to the end of the research study. First, it begins with a discussion of key findings of the data analysis presented in the previous chapter. It is then followed by a summary and conclusion of the study. Next, several pedagogic implications are provided to highlight the potential of wiki-based writing in second language classes. Limitations of the study and recommendations and directions for future research conclude the discussion in this chapter.

Discussion of Results

This section is intended to discuss the major findings of the quantitative and qualitative data set. The discussion is entirely based on the set of research questions mentioned in Chapter 1, and in relation to previous research studies. Before presenting and discussing each research question separately, it is worth reiterating that data were collected from more than one source to find complete answers to each question. An overview of the data sources is in Table 4 (see Chapter 3).

The first research question investigated the students' participation and interaction in the wiki-based writing assignments, and the extent to which small groups of three students made revisions to the class wiki pages. To elicit answers from students to Q1, the logged archives of the class wiki pages were analyzed and summarized (Table 11, see Chapter 4), and students' responses to participation-related items in the postquestionnaire were summarized (Table 10, see Chapter 4).

It can be clearly seen that both the logged archives and the responses of the questionnaires confirm that students' participation in the wiki-based assignments was encouraging and positive. Table 10 shows that across the six statements students responded to in the postsurvey, "My group engaged in discussion using the wiki" (Item 10) has the lowest mean of 3.74 (*SD* = 1.10). This was anticipated because groups were not required to use the comment box in the class wiki. In other words, groups were only asked to respond to the writing prompt as one jointly written paragraph and not as separate or disconnected statements; nevertheless, students used the comment box to communicate with the instructor for further guidance related to the assignments. In a very recent study, Zheng et al. (2015) confirmed, "The discussion page was also useful in shifting the instructor from an authoritative role to a more guiding or facilitating role" (p. 15). Interestingly, the two items "I valued the ideas and help my group brought to the wiki activities" (Item 14; *M* = 4.26, *SD* = 0.56) and "My group members agreed on final drafts easily" (Item 15; *M* = 4.26, *SD* = 0.73) shared the highest mean indicating that group members were agreeable and contributed effective ideas. The total mean was 4.08 (*SD* = 0.59), indicating that the majority of students were in agreement with all items. Not only were students in total agreement but also the majority of participants (84%, combining the *Agree* and *Strongly Agree* scales) was positive that wiki-based writing improved their level of participation and interaction in group writing work.

The quantitative findings for Q1 are strengthened by the qualitative results as well. By looking at Table 11, the qualitative results confirm that groups participated frequently on the three writing assignments with a total of 65, 47, and 21 revisions for the summary, compare/contrast, and classification paragraphs, respectively. One of the reasons why the

numbers of revisions in the three writing prompts are not similar or at least close is that groups were not fixed, but rotated for each task. Rotating students was one of the objectives of the study because the focus is on intragroup collaboration rather than intergroup collaboration. However, the total number of revisions for each task indicates that groups participated and edited wiki pages more frequently. Overall, the results related to students' participation in the wiki-based writing are consistent with previous related studies that confirm the high frequency participation of students on wiki platforms, for example (Lipponen, 2002; Moller et al., 2005; Zheng et al., 2015). Another finding is unequal participation among members of a specific group. Bearing in mind individual differences, it can be justified that some students collaborated more than others. Unequal participation is documented in related research studies such as Arnold et al.'s (2009) who reported that several students complained about unequal participation and poor communication within their groups.

The second research question examined the type of participation groups made to the class wiki pages. The researcher along with two experts in the field manually analyzed the content of all wiki revisions to recognize whether groups focused on additions or deletions (Table 12, see Chapter 4).

After in-depth analysis of revisions made by all groups, it can be noticed that groups focused on adding information more than deleting information. The total number of additions (583) is higher than the total number of deletions (514). Across all three assignments, students focused on adding more than deleting peers' contributions. This type of behavior is substantiated by previous research studies; for example, Dalke, Cassidy, Grobstein, and Blank (2007) reported that students in wiki-based collaborative

writings tend to avoid editing peers' contributions because students feel it is inappropriate to change peers' products. Also, one of the major findings in Meishar-Tal and Gorsky's (2010) study conducted on graduate students is that "students most frequently add content to a wiki rather than delete existing text" (p. 25). In another study conducted on university students, Zheng et al. (2015) stated that 97% of participants did not edit others' group work because either they felt "the work was not relevant to them or they were scared to do so" (p. 18).

Whereas Q2 explored additions and deletions, which overtly indicate intragroup interaction, the third research question closely examined two related things: the effect of writing tasks on the number of additions and deletions and whether additions and deletions related to form or meaning changes. It is worth restating that changes are classified based on the two adapted coding categories: FRCs and MRCs (Kessler, 2009; Kessler & Bikowski, 2010, respectively; see Tables 2 and 3 in Chapter 3). To fully address the third research question, the class wiki history logs and two predetermined groupings (i.e., academic writing and writing tasks; see Table 6 in Chapter 4) in the questionnaires were thoroughly examined to recognize the effect of the task on students' academic writing.

The instance frequencies presented in Table 13 (see Chapter 4) show that groups concentrated on FRCs far more than MRCs with a total of 406 to 197. Findings of students' responses to the postquestionnaire items show strong correlation; for instance, Item 6, "Wiki collaborative writing helped me attend to essay structure/organization," has a high mean (M = 4.32, SD = 0.58), but Item 4, "Wiki collaborative writing helped me attend to content development," has a low mean (M = 4.16, SD = 0.60). By examining

each writing assignment separately, the results reveal that the focus was on FRCs in two assignments (summary and compare/contrast), but not in the classification assignment. This implies that tasks that require higher order critical thinking skills attract students' attention to meaning more than form. According to Skehan (1998), students pay more attention to meaning if tasks demand too much attention to the content. By checking the results of the questionnaire, students implicitly admitted the effect of task on their participation. For instance, more than twice the participants (73.7%, combining the *Agree* and *Strongly Agree* scales) agreed to Item 9 (see Table 9, Chapter 4), "My degree of participation varied during the three wiki assignments" (M = 3.79, SD = 1.23), than disagreed.

These findings on the effect of tasks on FRCs and MRCs are in contrast to a study conducted on 34 university students by Aydın and Yıldız (2014). Their study asked EFL students to collaboratively complete three different wiki-based collaborative writing tasks (argumentative, informative, and decision-making). They concluded, "Students paid more attention to meaning rather than form regardless of the task type" (p. 160). Previous studies, though very few, show contradictory results with regard to students' attention to form or meaning. For example, findings of Bradley, Lindström, and Rystedt (2010), Elola and Oskoz (2010), and Lee's (2010) studies revealed that students' concentration on surface structure is higher than content structure in wiki-based writing. To the contrary, studies conducted by Kessler (2009), Woo et al. (2011), and Kessler et al. (2012), for instance, confirmed that students focused on meaning rather than form in web-based collaborative writing.

Strongly related to the third research question, FRCs and MRCs were analyzed and classified through the lens of Kessler (2009) and Kessler and Bikowski's (2010) classifications as a starting point. Nonetheless, only the incidents observed in the data set, along with some new categories, were included in the findings (Tables 14 and 15, see Chapter 4). The tables show (*in italics*) that tense, unnecessary words, capitalization, word order, singular/plural, and verb form are emerging FRC categories, and the only additional category in MRCs is word choice. It is worth mentioning that error analysis was beyond the scope of the study. The study only focused on the type of interaction and the frequencies of FRC and MRC categories that groups attended to when responding to the three writing tasks.

With a total of 406 FRCs (see Table 14), groups attended to several grammatical categories that range from 1 change in verb form to 56 changes in punctuation. Regardless of the FRC category, the high number of changes indicates that groups concentrated on grammatical inaccuracy through the three writing tasks. This is in line with previous research studies that reported students' attention to grammatical correctness. In a study that examined the writer–reader relationship, Kuteeva (2011) carried out a study on 14 heterogeneous students using a wiki in the course *Effective Communication in English* at a Swedish university. Her study findings indicated that students paid close attention to grammatical correctness and structure coherence in the wiki-based writing. Similar findings were reported by Alshumaimeri (2011) who investigated the use of wikis in improving writing skills among 42 students at a Saudi university. While the distribution of FRCs in the current study is not completely parallel to the distribution of FRCs in Kessler's (2009) study, spelling and word choice types are

highly frequently edited in both studies. Very significantly, this study did not investigate the accuracy of students' contributions, but it classified their contributions as the proper FRC type. Table 14 highlights the frequencies of FRC categories and the degree of attention groups paid to grammatical structures.

With regard to the MRC categories detected in the data, it is obvious that adding a subtopic that had already been introduced (i.e., clarification of information) comes in first with a total of 83 instances. This goes hand in hand with the findings of Aydın and Yıldız's study (2014), yet in contrast with Kessler and Bikowski's (2010) study, which observed this category less than adding or deleting information. Kessler and Bikowski argued that students' engagement in clarification/elaboration of information suggests that students interact with the content rather than merely adding or deleting information. Interestingly, clarification of information and synthesis of information are the most frequent categories, which explicitly explain that students tried to link contribution to previous ideas and supported one another to complete one meaningful product. This scaffolding indicates not only that groups worked collaboratively to respond to the designated tasks, but also that groups mutually negotiated meaning and constructed the final product. In other words, Vygotskian's notion of ZPD is apparent in the three wiki-based writing assignments. As an emerging MRC type, word choice, which means changing a word or a few words that affect the meaning, was observed in all writing assignments with a total of 24 instances. For example, in the classification assignment, a group classified the types of vacation; a student changed the word *mountains* to *islands* to indicate places for relaxing vacation. The study also confirms that adding links is rarely

attended to, and this finding is completely consistent with Aydın and Yıldız's (2014) study.

As far as students' attitudes toward wiki-based collaborative writings are concerned, Research Question 4 attempted to elicit students' overall perspectives using two sources to cross-validate the findings. First, students were given Items 1 and 2 in the questionnaire and, second, students were asked to respond to the open-ended responses. Whereas students' attitudes were compared in the pre- and post-questionnaires to get a better understanding of students' perspectives, the open-ended questions allowed students to openly express their attitudes based on their own experience. The key findings of both the questionnaires (Table 7, see Chapter 4) and the students' open responses indicate that the overall perspectives on wikis in writing assignments are generally positive. This finding is supported by previous wiki-related studies (e.g., Ducate et al., 2011; Elola & Oskoz, 2010; Kost, 2011; Lee, 2010).

Table 7 compares students' attitudes toward collaborative writing in wiki-based and classroom settings. Whereas Items 1 and 2 assessed students' attitudes toward enjoyment of and preference for collaborative writing using wikis, Item 14 (assessed at presurvey) assessed participants' attitudes toward small group work in traditional classrooms. The mean of Item 1 ("I enjoyed using wikis for collaborative writing") and Item 2 ("I preferred doing collaborative writing on wikis to writing individually") is 4.08 (*SD* = 0.80), indicating that participants felt positive about the collaborative assignments. In comparison, the mean of Item 14 of the presurvey, "Your attitude toward small group work is...," is slightly lower at 3.83 (*SD* = 0.92). This implies that students had a

preference for wiki-based collaborative writing compared to traditional classroom group work.

Not only did students' responses to the open-ended questions confirm the key results findings of the questionnaires, but also the responses indicate several reasons why students liked the wiki environment. Sharing ideas, scaffolding, and editability are some reasons. Nevertheless, a few students reported a couple of challenges they encountered in wiki-based writing. Technical glitches and unequal participation were the main concern for students in this study. These challenges were reported in previous research; for instance, Alyousef and Picard (2011) argued that students in their study were concerned about unequal contribution. For technical problems, several studies (e.g., Ducate et al., 2011; Lin & Yang, 2011; Woo et al., 2011) stated that technical issues associated with web-based writing discouraged students from using wiki-based writing.

Summary of the Study

This research intended to bridge the gap about students' interaction in wiki-based collaborative writing, advance our understanding in the line of inquiry, and contribute to the CALL field through exploring wiki-based collaborative writing tasks in ESL institutes in the United States. The primary objective of this study was to investigate ESL students' attitudes and small group interactions in wiki-based collaborative writing, and in particular, to examine the effect of writing tasks on students' attention to form-related or meaning-related changes. The participants in this study were 18 intermediate-level international students enrolled in an IEP at an urban U.S. Mid-South university. By implementing a mixed-methods approach, data were collected over two subsequent sessions (spring and summer 2015) for 8 weeks each. A triangulation design was adopted

to concurrently collect data by means of multiple instruments: questionnaires, which include closed-ended and open-ended statements, and the class wiki data (i.e., logged archives). Four research questions guided this study, which can be narrowed down to four main areas: participation in group writing, type of participation, effect of writing tasks on FRCs and MRCs, and students' attitudes toward wiki-based collaborative writing.

The key findings of the study indicated that students participated and revised the class wiki pages frequently. This finding is in total agreement with Moller et al. (2005) who argued that wiki-based writing promotes participation. The study also showed that, regardless of the writing task, students concentrated on adding information far more than deleting information. By editing the wiki pages, students implicitly viewed writing as a process and not as a finished product (Lamb, as cited in Parker & Chao, 2007). Another interesting finding is that students' attention to form-related or meaning-related changes was greatly affected by the writing task. Although this finding is limited to the current study and cannot be generalized, it could contribute to the field because studies that have investigated the effect of tasks on collaborative writing (e.g., Alyousef & Picard, 2011; Lee, 2010; Lund & Rasmussen, 2008) are still scarce. Finally, and consistent with several recent studies (e.g., Ducate et al., 2011; Elola & Oskoz, 2010; Kost, 2011; Lee, 2010), students expressed very positive attitudes toward wiki-based writing, though it was the first time they were exposed to wiki-based writing, and they hoped to have wikis integrated in all levels of writing classes.

These key findings are simply justified if they are viewed in light of the main theoretical frameworks that shape the current study. The findings indicated that students, in small groups, collaborated, interacted with one another, and negotiated meaning to

complete the designated writing tasks. In other words, the SCT of learning (Vygotsky, 1978), which umbrellas the notions of the ZPD and scaffolding, and the interaction hypothesis (Long, 1983), which informs how participants in this study responded to wiki-based collaborative activities, were apparent.

Pedagogic Implications

This study has a number of pedagogic and instructional implications for people involved in second language writing such as second language learners, second language instructors, and curriculum designers. It demonstrates that wiki-based writing helps students consider writing as a process and not as a finished product. This means that the functionality of wiki-based writing allows students to make edits by drafting, revising, and submitting. By integrating wiki-based writing, students are trained to consider writing as a recursive skill, which requires time and effort for many language learners to learn by themselves. What is more, collaborative writing, as a built-in feature in wikis, permits second language learners not only to think collaboratively and scaffold one another, but also to regard writing as a productive communicative skill that builds harmony between a writer and a reader.

Integrating wikis in writing classes opens new avenues for writing instructors, particularly in assessment. For instance, history logs greatly assist writing instructors to monitor students' participation throughout the whole process of composition as every edit is automatically saved by name, time, and date. By recognizing students' attention in the writing process, which includes high/low frequency edits of FRC and MRC categories, writing instructors modify teaching methods and address students' challenging points accordingly. Not only do wikis offer writing instructors innovative ways in assessment,

but also they make self- and peer-review attainable as students have the ability to add, delete, or change contributions. Finally, a lot of studies (e.g., Ducate et al., 2011; Elola & Oskoz, 2010; Kost, 2011; Lee, 2010), including this one, state that students express positive perspectives on wiki-based writing; thus, it is highly recommended for curriculum designers to reconsider using this nascent collaborative tool (i.e., wikis) to facilitate second language teaching and learning.

Limitations of the Study

A number of limitations are to be recognized in the interpretation of the results. First, the study was conducted on a small scale of students because few students enrolled in the IEP—the data collection site each session. Having 18 students in 2 sessions (about 9 students each session), the writing instructor grouped students into 6 groups and students were rotated for each writing task. Therefore, the results are not to be assumed if the settings are different—for example, with large groups or fixed groups. Another limitation is the limited number of writing activities given to students for the reason that each session lasts 8 weeks. It is worth noting that intermediate-level ESL students are rarely exposed to different writing genres or given the opportunity to compose long essays in a short period of time. In spite of the fact that this study examined intragroup interaction to recognize students' attention to FRCs and MRCs, the accuracy of students' contributions (i.e., error analysis) was not explored.

Although this is the first study, to the best of my knowledge, to be conducted on precollege ESL students in the United States, the findings cannot be overgeneralized to all ESL levels, or all ESL schools in the United States, because the study was limited in scope and context—that is, intermediate-level ESL students at an urban U.S. Mid-South

university. Furthermore, it was beyond the scope of this study to compare collaborative wiki-based writing to face-to-face (i.e., classroom) collaborative writing or to investigate the effectiveness of wiki-based writing on students' writing performance. Finally, the wiki-based collaborative writing activities used in this study were supplementary to the course requirements. In other words, students were not heavily assessed on their participation in the wiki class assignments because that was not an objective of the study. The research results might be different if groups were assessed on their contributions either individually or collaboratively.

Recommendations for Future Studies

This study closely examined both intermediate-level ESL students' attitudes and small intragroup interaction in wiki-based collaborative writing. Whereas the findings showed positive attitudes toward wikis, students' attention to *form* or *meaning* was not similar in all writing tasks (i.e., writing assignments). Future studies on advanced-level ESL students are highly recommended to substantiate the results of the current study. The need to conduct a study on advanced-level ESL students is also recommended by the writing instructor whose students participated in the current study. A. Durden stated, "I believe the Wiki works well with advanced writing students, those who can find and correct their and others' errors" (personal communication, February 7, 2016).

There is still a need for studies to deeply explore the effect of writing tasks in wiki-based writing. The current study examined three writing types—namely, summary, compare/contrast, and classification—yet other writing types that require higher thinking skills are worth investigating. Although this study focused on the FRC and MRC classifications, analyzing self-errors and peer-errors is very significant for assessing

writing proficiency. While a lot of studies, including this one, showed students' attitudes toward wiki-based writing are positive, ESL writing instructors' attitudes toward wiki-based writing are worth exploring. Strikingly, and though it was not an aim of this study, the writing instructor was doubtful about the effectiveness of wikis in intermediate-level writing classes. She stated, "I personally prefer to have my intermediate students do in-class group writing assignments, because in that way I can supervise their work and monitor who is doing the work" (A. Durden, personal communication, February 7, 2016). Introducing wikis to ESL writing instructors and integrating lengthy wiki-based writing activities into different writing levels allow teachers to make sound judgments.

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APPENDIX A

Information Sheet

I would like to invite you to answer the following questions concerning your background information and your learning experiences. Please provide your information as precisely as possible. All the information collected will be highly confidential and will be used for this study only.

1. Name:
2. Nationality:
3. Gender: ☐Male ☐Female
4. Age: _____
5. Home country: _____
6. How many years have you been studying English? _____
7. What are your goals of learning English?

   _____

   _____

   _____

   _____

   _____

8. Your experiences of learning English are:

   ☐Very positive

   ☐Positive

   ☐Neutral

   ☐Negative

   ☐Very negative

APPENDIX B

IRB Approval

Hello,

The University of Memphis Institutional Review Board, FWA00006815, has reviewed and approved your submission in accordance with all applicable statuses and regulations as well as ethical principles.

PI NAME: Abdurrazzag Alghammas

CO-PI:

PROJECT TITLE: Wiki-based collaborative writing tasks in ESL context

FACULTY ADVISOR NAME (if applicable): Emily Thrush

IRB ID: #3615

APPROVAL DATE: 3/27/2015

EXPIRATION DATE: 3/27/2016

LEVEL OF REVIEW: Expedited

Please Note: Modifications do not extend the expiration of the original approval

Approval of this project is given with the following obligations:

1. If this IRB approval has an expiration date, an approved renewal must be in effect to continue the project prior to that date. If approval is not obtained,

the human consent form(s) and recruiting material(s) are no longer valid and any research activities involving human subjects must stop.

2. When the project is finished or terminated, a completion form must be completed and sent to the board.

3. No change may be made in the approved protocol without prior board approval, whether the approved protocol was reviewed at the Exempt, Exedited or Full Board level.

4. Exempt approval are considered to have no expiration date and no further review is necessary unless the protocol needs modification.

Approval of this project is given with the following special obligations: Thank you,

James P. Whelan, Ph.D.

Institutional Review Board Chair The University of Memphis.

Note: Review outcomes will be communicated to the email address on file. This email should be considered an official communication from the UM IRB. Consent Forms are no longer being stamped as well. Please contact the IRB at IRB@memphis.edu if a letter on IRB letterhead is required.

APPENDIX C

Permission to Adapt Questionnaire

From: **Mimi Li** mli3@mail.usf.edu
Subject: Re: Enquiry
Date: January 27, 2015 at 6:34 PM
To: Abdurrazzag Alghammas (lghammas) lghammas@memphis.edu

ML

Dear Abdurrazzag,

It is good to hear from you. Yes, you are more than welcome to adapt the questions I developed in my dissertation study. Please just remember to cite this piece of work.

Good luck

with your

academic

pursuit! Best,
Mimi Li

On Tue, Jan 27, 2015 at 6:12 PM, Abdurrazzag Alghammas (lghammas) <lghammas@memphis.edu> wrote:

> Dear Dr. Li
>
> This is Abdurrazzag Alghammas, a PhD candidate in Applied Linguistics- university of Memphis. I am very interested in the interaction of ESL students while doing different writing wiki-based tasks. I was wondering if I could adapt the questions used in the questionnaires and interviews in your study *Small Group Interactions in Wiki-Based Collaborative Writing in the EAP Context.*
>
> Thank you and look forward to hearing from
>
> you soon. Abdurrazzag

APPENDIX D

Pre- and Post-Survey Questionnaires

A. Presurvey questionnaire

Participant ID: Date:

The following questionnaire is designed for my dissertation study on wiki-based collaborative writing in the ESL writing course. Please provide your information as precisely as possible. All the information collected will be highly confidential and will be used for this study only. Thank you very much indeed for your participation.

1. How often do you use the computer? _____ hours per day.
2. You use the computer for: (Please choose all that apply.)
   ☐ Study ☐ Fun ☐ Social networking
3. Have you worked on a group project using wikis before? If (Yes), briefly comment on the wiki project(s).
   _____
   _____
   _____
   _____
4. Your experience in using other Web 2.0 tools (e.g., Blogs, Twitter, Facebook)
   _____
   _____
   _____
   _____
5. Your classroom work style:
   * Your attitude toward individual work is:

☐ Very positive ☐ Positive ☐ Neutral ☐ Negative ☐ Very negative

* Your attitude toward small group work is:

☐ Very positive ☐ Positive ☐ Neutral ☐ Negative ☐ Very negative

B. Postsurvey questionnaire

Participant ID: Date:

Thank you very much for participating in my dissertation study. The following are some statements concerning your perceptions about the wiki-based collaborative writing assignments. Please carefully read them and honestly indicate the extent to which you agree or disagree with each statement on the 5-point scale.

Thank you again for your time and sincere responses!

The scale:
1 = *Strongly agree*; 2 = *Agree*; 3 = *Neutral*; 4 = *Disagree*; 5 = *Strongly disagree*

Statement	**SA 1**	**A 2**	**N 3**	**D 4**	**SD 5**
1. I enjoyed using wikis for collaborative writing.					
2. I preferred doing collaborative writing on wikis to writing individually.					
3. Wiki-based collaborative assignments improved my writing skills.					
4. Wiki collaborative writing helped me attend to content development.					
5. Wiki collaborative writing helped me attend to language use.					
6. Wiki collaborative writing helped me attend to essay structure/organization.					
7. I was able to use the genre knowledge we learned in class to respond to the assignments posted on the wiki.					
8. I enjoyed the revision process in the wiki.					
9. My degree of participation varied during the three wiki assignments.					
10. My group engaged in discussion using the wiki.					
11. My group often discussed the writing assignment outside the wiki (e.g., in face-to-face conversations, emails, online chat, etc.).					
12. I was able to make important contributions to the wiki-based writing assignments.					
13. I think my group members valued my contribution.					
14. I valued the ideas and help my group brought to the wiki activities.					
15. My group members agreed on the final drafts easily.					
16. All my group members contributed to the wiki tasks equally.					

APPENDIX E

Informed Consent Form

Consent to Participate in a Research Study
Wiki-based collaborative writing tasks in ESL contexts

IRB Study # 12747782

Dear student,

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or your instructor to discuss this consent form with you; please ask him/her to explain any words or information you do not clearly understand.

You are being invited to participate in this research study titled *Wiki-based collaborative writing tasks in ESL context.* Your volunteer participation in this research study will enable you to be among your classmates who will help the researcher to successfully complete his research on the above-cited topic.

I am Abdurrazzag Alghammas, a graduate student at the University of Memphis, Department of English, being guided in this research by Professor Emily Thrush, Department of English at the University of Memphis. There may be other people on the research team assisting at different times during the study.

Purpose of the Study

The purpose of this study is to explore the wiki-based collaborative writing activities for international pre-college students in an ESL course. This study is expected to highlight how the wiki technology may open up great possibilities for small group academic writing in the ESL context.

Study Procedures

As a training session, you will be trained how to write collaboratively on the PBworks site. You will then work on three course assignments, i.e., different writing genres, jointly with three or four other group members on the PBworks site. Each task (i.e., assignment) will last one to two weeks. If you take part in this research study, you will be asked to complete a 20-minute pre-task questionnaire concerning your background information. After finishing the three assignments, you will be asked to complete a 20-minute post-task questionnaire regarding the use of wikis for group work and collaborative writing. Your archived wiki records addressing your group dynamics and individual contribution will also be collected. Finally, you will be invited to participate in individual interviews based on your willingness. The interviews, which will last an hour, will be conducted in written English.

Alternatives

You have the alternative to choose not to participate in this research study.

Benefits

The potential benefits to you are:

You will have an experience in collaborative writing through the CMC technology "Wiki". The interactions and discussion with the peers will help you broaden your writing perspectives and enhance your writing skills/strategies. The use of the Web 2.0 technology will also expose you to the learning dynamics, which will be beneficial to your future learning.

Risks or Discomfort

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study.

Confidentiality

I must keep your study records as confidential as possible. However, certain people may need to see your study records. By law, anyone who looks at your records must keep them completely confidential. The only people who will be allowed to see these records are: the researcher, his advisor, the writing instructor, and research committee members.

More importantly, I may publish what we learn from this study. If I do so, I will not let anyone know your name. I will not publish anything else that would let people know who you are.

Voluntary Participation / Withdrawal

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study, to please the investigator or your instructor. You are free to participate in this research or withdraw at any time. Your decision to participate or not participate will not affect your student status in the ESL course.

Questions and Concerns

For any concerns and queries with regard to this research study, please let me know via lghammas@memphis.edu or contact me at 901-417-9889 or if you have questions about your rights as a research subject, contact Beverly Jacobik, Administrator for the Institutional Review Board for the Protection of Human Subjects either via e-mail at irb@memphis.edu or by phone at 901-678-2705 or both. You can also contact Dr. Emily Thrush, the advisor for this study, via (901) 678-4215 or ethrush@memphis.edu or both.

Please note that all the data collected for this study will be kept locked under the strict supervision of the researcher in personal locker(s). Your participation in the class wiki will also be password-protected and the computer and drive(s) used by the researcher will not be left unattended.

By signing this form, you acknowledge that you understand the nature of the study, the potential risks to you (if any) as a participant, and the means by which your identity will be kept confidential. Your signature on this form also indicates that you are 18 years old or older, and that you give your permission to voluntarily serve as a participant in the study described.

Thank you for volunteering and I appreciate your efforts for sparing time for this research study.

Sincerely,

Abdurrazzag Alghammas
Graduate student, Applied Linguistics
The University of Memphis, TN, USA

_____ _____
Signature of person agreeing to take part in the study Date

_____ _____
Printed name of person agreeing to take part in the study Date

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect. I hereby certify that when this person signs this form, to the best of my knowledge, he or she understands:

• What the study is about.
• What procedures will be used.
• What the potential benefits might be.
• What the known risks might be.

_____ _____
Signature of Person Obtaining Informed Consent Date

_____
Printed Name of Person Obtaining Informed Consent

APPENDIX F

Participants' Objectives to Learn English

What are your goals of learning English?

Text Response
to improve my English , to develop my reading writing and speaking skills.
I want to complete my education in the university and to learn another language.
English is the first spoken language, it is really important to in many in fields, too. Also I want to get a master degree.
Become bilingual
My goal is to be fluent in Englsih and then get an admission for a college degree.
I'm studying English to complete my education.
Complete my education in US
To get MBA in America
I want to continue studing in US.
To be professional and to study Phd in Coomputer Science
complete master degree
familyer with English
I would like to earn master's degree in USA.
I want to study my major in English
Go to university
My goals is to be able to read and write in English fluency. I'd like to read many English books and write many essays.
improve my english skills to get my master degree & Phd Degree
to apply for master

APPENDIX G

Participants' Experiences with Web 2.0 Applications

Describe your experience in using other Web 2.0 tools (e.g. Blogs, Twitter, Facebook).

Text Response
I don't use computer much.
I used Blog in level three. I didn't like it.
Lately, I have not used a lot facebook but I am able to do many things like public posts, share other posts, ecc... I created a blog for my capstone thesis two years ago and It is still working, and when I was teenagers I used to write my thoughts on a blog that I created.
I often use Twitter and Facebook apps on mobile phone.
actually I don't like it, because most of time when I use it take the whole day. for example if I set on my phone to watch a video or some thing this wont be the only one I will be like let my watch this and that.
this is good; but sometimes difficult for me because I need to practice more in the computer.
A littele activity
share the idea and information from all over the world
I use Facebook a lot.
I use Facebook.
Facebook
I'm using the Facebook. I don't like to use. Just waste my time.
I use Facebook to keep in touch with my friends in my mother country.
facebook & twitter since 2008

APPENDIX H

Participants' Responses to the Four Open-Ended Questions

1. What is your overall impression of small group writing using wikis?

Text Response
A
A lot of information from the students
I can see other members' writing immediately. It is good to be able to check which parts they modified.
I didn't like it that mach because there are some of them they don't like to work So I will be stuck with them.
I like it.
I like to work in group.
In general, I thik that this is very helpfully proyect for everyone.
I prefer individual
I think that in general wiki could be an useful tool for reading and writing class.Small group of people help to achive the goals. Probably 5 people is the best number.
I think that this protect is very well and can help to many students in to lean English.
It is a unique experince, but I do not like working in group specially writng because of disagreeing.
it is great
It was assistant to me .
It was good to group working.
Share the information or different ideas
The group were able to participate and correcting each other.
To write easily and group can share their opinion easily.

2. What did you like about writing in small groups using wikis?

Text Response
Collection information form different students
If all people give their contribution to the tasks, you can learn a lot and significantly improve your skills. But my experience wasn't really satisfied, except for the last task.
It good because the group can add or remove ideas whenever they need to make some changes.
I like to see how poeple wrtie because I think it is helpful to learn writing. Also, I like to see the mistakes they make to avoid it.
share ideas
I did my work at any time and in any place.
I like that every one could write and help each other.
I like that I do it any time and if there is part I don't like to write it so my members in the grop will help me .
I could understand thinking of member.
I can fix the paragraph it easily and I can check what they fixed and what I did wrong.
More one idea
I took some experience from group mates
Writing these paragraphs with my friends.
I like small group because only one person can edit paragraph at one time
To be honest, nothing, i preferred to do it individualy to know my own mistakes
Thanks to Wiki, I can work with members even at home. And I don't have to wait for members' writing to end.
better for communicate

3. What did you NOT like about writing in small groups using wikis?

Text Response
Nothing
If wiki isn't use like tool integrated in the class (with grde for every task), i think that the problem could be that people aren't really concerned with the task
Everything is good.
It is cofusing and a lot of disagreeing.
No things .
Some people did not work.
I need to wait sometimes .
I didn't like that some times when I open it I find it used by someone
Nothung
No, I liked it.
!
I didn't like that a lot of messages came to my email
Probably, I did not like that the system is close when other one is writing the paragraph.
I enjoyed in small group.
My degrees depends on the others writing skills
Nothing special. I like Wiki.
who will start

4. What suggestions would you like to add to make wiki-based collaborative writing assignments more effective for ESL students?

Text Response
?????
Include wiki as part of homework
Just make known to people.
I think it is good , and it doesn't need change.
.
I don't have
I think that to do more information about Wiki in all levels.
Spereat the job before we start in it
Nothing
Yes, I suggest to ESL students.
Maybe words editor
To put more correct text, for example, make a double space and etc.
If it is proyect can be with every leves in IEI.
When you finish your work, read again! Then, you can find your mistakes in it.
Make it individualy, show the mistakes, better to use unknown subjects
I don't have any idea. I'm satisfied with the existent way.
force them for review