

WCETR 2011

The effects of wikis on foreign language students writing performance

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Abstract

This study investigated the use of wikis in improving writing skills among 42 male students at the Preparatory Year (PY) in King Saud University in Saudi Arabia. Research questions investigated writing accuracy and quality. Performance results on pre- and post-tests revealed that both groups improved significantly overtime in both accuracy and quality. However, the experimental group significantly outperformed the control group in both accuracy and quality of writing in the post-test. The implications of the results are that wikis can benefit teachers and students by improving their writing skills in accuracy and quality in a collaborative environment.

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Keywords: Accuracy; CALL; EFL; Quality; Saudi Arabia; Wiki; Writing

1. Introduction

With teaching through technology becoming increasingly integrated into teaching methodologies, educators strive to ensure these methods are in fact enhancing student learning. As a Web 2.0 technology, wikis are collaborative tools allowing pre-defined groups to edit each others work. Although wikis are being used globally in many classrooms to teach writing, studies have shown that the quality and accuracy of students' work is not always improving (Coniam & Mak, 2008). Research suggests that while wikis can improve students' English ability (Chen, 2008; Franco, 2008), care should be taken to support aspects of wiki learning, such as collaborative assignments, that result in positive outcomes.

Technology use in the classroom is proliferating at such a rate that evaluation of technological innovations is trailing far behind. Literature suggests that while wikis can be effective in some regards there are challenges. One such challenge is the technological knowledge of teachers and students (Coyle, 2010) that must be taken into account. When used to support existing pedagogy and enhance student interaction in socially current ways, technology can effectively support student-centered constructivist learning. This study adds to previous investigations on the effects of wikis on students' writing skills.

2. Research Questions

The study aims to investigate the effects of using wikis on the students writing performance by engaging them in a collaborative learning environment. It seeks to answer the following questions:

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- (1) Will there be a significant improvement in the students' performance in the post writing test regarding the accuracy and quality of their writing?
- (2) Are there any significant differences between the two groups in the post-tests in relation to the treatment?

3. Literature Review

3.1. Wikis and Collaborative Learning

Wikis are considered to be valuable collaborative tools. According to Packalén, Patokorpi, and Tétard (2008) wikis have encouraged peer-to-peer collaboration world-wide. Chen, Chen, and Sun (2010), in studying collaborative learning environments, found that a Web 2.0 Tag-based Collaborative reading learning System (TACO) led to significant improvement in reading scores among participants. In addition, Chao and Parker (2007) argue that students should be introduced to technologies that help them work collaboratively in order to aid familiarization with such tools.

Wikis can also help teachers provide an autonomous environment for the students (Kessler, 2009). Wikis, being student-centered, give students a chance to work together and collaborate on their work without the strong presence of the teacher. Furthermore, wikis can facilitate interaction between learners (Cowan, Herring, Rich, & Wilkes, 2009). Students interact with their peers to collaborate on their work giving them a chance to comment, discuss new ideas, and discuss edits (Reo, 2006). Xiao and Lucking (2008) conducted a study to compare the effects of a wiki-based peer assessment method on university students' academic writing performance. The authors found the students in the experimental group demonstrated greater improvement in their writing than those in the control group and that students in the experimental group exhibited greater satisfaction with the peer assessment method (Xiao & Lucking, 2008).

Cowan, Herring, Rich, and Wilkes (2009) investigated the use of wikis to support group project work in online undergraduate courses in business and education at Athens State University. Findings suggest wikis encourage individual and group responsibility. The teacher and students can see the contributions and changes each student makes through the feature of 'playback' which facilitates fair assessment of all group members (Elgort, Smith & Toland, 2008). Therefore, wikis help solve the problem of free riding in group work where one person controls the project and does all the work (Wicks, 2006).

Discussing how wikis enable collaborative and networked interaction between students, Coyle (2010) found that students engaged more with the required weekly post than with the collaborative assignments. However, students made more impressive gains in the types of knowledge-building they created in collaborative assignments. Coyle (2010) suggests one of the primary challenges in creating composition studies that are successful is the difference between the technologically savvy students and their instructors. Nonetheless, Coyle (2010) holds that given the right pedagogical underpinnings, wikis in the composition classroom can help bridge the generational and technological gaps between instructors and students.

In evaluating eighteen students from a private language school in Brazil, Franco's (2008) study analyzed student participation in wikis as well as responses to an online questionnaire in order to determine whether students' writing skills improve if collaborative learning strategies are applied in a digital context. Findings indicated that learners effectively shared responsibility with their peers and became less dependent on the teacher (Franco, 2008). Such results indicate that while students do become more autonomous because of the choices the wikis provide, they also benefit from providing and receiving feedback from peers.

3.2. Wikis and EFL Learning

As discussed by Pop (2010), the employment of Web 2.0 tools in foreign language instruction enhances student satisfaction, motivation, confidence and disposition. A study conducted by Chang (2010) explored the benefits of group work in EFL courses. The results of the study were that group work helped students' social interaction to improve and motivated them to work together to develop their language and complete tasks (Chang, 2010).

In regard to improvements in English language ability, Chen (2008) found that EFL student groups in Taiwan using wikis performed better in listening and reading abilities. The purpose of Chen's (2008) study was to examine the effectiveness of applying wikis in terms of learning outcomes, changes regarding students' attitude towards language learning, wiki-based communication channels that facilitate student interaction, and students' experience with wikis. The wiki group reported having a more favorable attitude towards cooperative learning, the class, and improvements in their English ability. Students reported feeling comfortable with the use of wikis and the wiki learning environment as well as the tool's ability to help them complete their assignments.

Moreover, Bubas, Kovacic and Zlatovic (2007) investigated the potential uses of a wiki in English for Specific Purposes (ESP) courses. The results were that Wikis helped in creating an innovative learning environment where students were interested and engaged in the learning process. This enriched environment led to improvement in their language skills, developed their vocabulary, and gave students the opportunity to learn from each other (Bubas, Kovacic, & Zlatovic, 2007).

A study conducted by Miyazoe and Anderson (2009) examined the use of forums, blogs, and wikis in an EFL-blended learning course in a Tokyo university. The study, aiming to determine what progress the students made through the use of the online tools, found there was general success in making qualitative changes in students' writing abilities (Miyazoe & Anderson, 2009).

3.3. Wikis and **Writing Skills**

Using a wiki, students can experience writing as a social process (Richardson, 2006). Higdon (2006) found that using wikis in writing helped students engage and produce more writing than anticipated. In addition, Higdon (2006) found teachers wasted less class time on checking students' work because they were able to check the wiki out of class (Higdon, 2006).

In her work on the use of wikis in a course of Effective Communication in English, Kuteeva (2011) investigated how a wiki was used to teach writing for academic and professional purposes, and what impact using the wiki had on the writer–reader relationship. Findings indicated that using the wiki for writing activities made students pay closer attention to grammatical correctness and structural coherence (Kuteeva, 2011).

According to Coniam and Mak (2008) wikis can help develop ESL students' writing skills in many ways, but students' accuracy can worsen. Coniam and Mak's (2008) project, involving year seven students in a Hong Kong secondary school, was to develop a school brochure for parents. The study investigated the effects of using wikis on the quantity and quality, regarding accuracy and coherence, of students' writing. The authors found that students produced more words than expected, coherence improved, and motivation heightened. However, some students' accuracy improved while others worsened (Coniam & Mak, 2008).

Constructivism is a theory of learning that suggests people gain knowledge through action and experience followed by reflection and reconciliation of new ideas with old. Using constructivism to understand the role of the wiki in EFL learning among university freshmen in Japan, Yates (2008) researched student behavior while completing a wiki project that was designed with a constructivist framework. The study sought to explore whether or not a wiki project, structured using the principles of constructivism, could increase collaboration both in the wiki and during face-to-face discussions (Yates, 2008). Yates (2008) found that the students enjoyed using the wiki and met classroom objectives. Although the study author felt there were some methodological issues, overall a wiki designed with a constructivist framework was found to have potential as an effective medium for collaborative learning (Yates, 2008).

With wikis supporting collaborative writing and social interaction, student language competence overall can be enhanced. Lin (2005) examined the effectiveness of using wikis to assist collaborative writing among 20 college EFL students. The research found that collaborative writing improves English awareness and writing ability as well as fostering the contribution of peers (Lin, 2005). Furthermore, Lin's (2005) study suggests that underachievers show greater engagement with the wiki technology and in turn extend their Zone of Proximal Development (ZPD) in online collaborative learning.

Also exploring whether or not wikis enhance student writing, Kennedy (2010) examined the work of 207 university students to determine the effect of assigning work on blogs, wikis, and e-portfolios. The research found these technological applications did enhance the opportunity for student success (Kennedy, 2010). Students' writing composition was found to improve, although Kennedy's (2010) findings suggest there is a learning curve for students and instructors to master the technologies.

A study conducted by Alshalan (2010), investigating the use of wikis in improving writing skills among female 10th graders in Saudi Arabia, showed inconclusive results. The results were inconclusive in terms of the improvement related to using wikis as there were no significant differences between the control and experimental group in terms of accuracy and quality. Performance results on pre- and post-tests revealed that the control group, taught using traditional methods, did not improve in terms of writing accuracy overall. The experimental group improved in structure. In terms of writing quality, the control group improved in organization only. The experimental group's quality improved over all. The current study is similar to Alshalan (2010) in its procedures, though it differs in significant ways in terms of context, participants, materials, and data analysis procedures.

4. Methodology

4.1. Context and Participants

The study was classroom-based and conducted in a university first year preparatory program. The participants of this study were 42 level two male students at the Preparatory Year (PY) in King Saud University (KSU), Saudi Arabia. The students were enrolled in the Intensive English program, 20 weekly contact hours, for two semesters. The program aims to develop students' English language proficiency and equip them with the essential language skills needed for academic study and future professional life. There are six levels of proficiency in the program where level six is for advanced learners and level one is for false beginners. Level two is equal to A2 level according to the Common European Framework. The students were selected using a simple random selection and two classes were chosen to participate. There were 22 students in the experimental group and 20 students in the control group. The two classes were used for a total of 10 classes over a six week period in April-May 2011. The class teacher is a native speaker of English and has taught English for 7 years.

In order to ensure that the subjects in this study were at the same proficiency level in writing in terms of accuracy and quality of their writing, a writing pre-test was assigned to both groups. The results of the pre-test show that the mean averages of the subjects' grades on the pre-test were very similar (see Table 1). These results were computed through Independent Samples Test (t-test) and revealed at the $p < .05$ level in scores for the two groups [$t = -.081$, $p = 0.935$].

Table 1. T-test Results for the Groups' Equivalence

Group	No.	Mean	St. Deviation	t Value	Sig. (2-tailed)
Control	20	16.5000	1.60591	-.081	0.935
Experimental	22	16.5455	1.96946		

4.2. Research Design

The design of this study follows a quasi-experimental design. Subjects were not assigned randomly to treatments, but there was a control group (Kerlinger & Lee, 2000). The main aim of this study is to explore the effects of wikis on the students' performance in terms of the accuracy and quality of their writing. Accuracy refers here to the lexico-grammatical accuracy (e.g. spelling, word choice, word order, punctuation), whereas quality refers to organization, elaboration, coverage, clarity, links, and intent (modified from CEF, 2001). The students' performance can be identified in their scores in the final post-test in both the experimental and control groups compared with their scores in the pre-test.

4.3. Material and Data Collection Procedure

The wiki used in this study was designed by the researchers with the class instructor through the wiki website “wikispaces.com” and the wiki address is: <http://pyeng150.wikispaces.com/>. In the introductory session, students were asked to navigate and explore the wiki. Then during the experiment sessions, the students were asked to perform the activities provided collaboratively in groups. In the revision stage, the students had to edit their work to produce an error free piece of writing. Finally, the students complete their work by writing the final draft, organizing the layout, and presenting to the class. After that a peer review evaluation was conducted for each presentation. Pre- and post-test are similar in genre (descriptive writing), however, differ in topic. Analytic scoring rubric was used to assess the students writing. Analytic scoring scheme is widely recognized and allows for more detailed information about the test-takers performance in different aspects of writing (East, 2009; Hyland, 2003; Weigle, 2002). Analytic scoring scheme was found to be more reliable than holistic scoring scheme (East, 2009; Weigle, 2002; Bacha, 2001; White, 1985). Inter-rater scoring was also used as the class teacher rated the writing pre- and post-test and then the researcher rated them again with very high consensus and consistency between the two scores (the agreement level was 97%).

5. The Results

This study investigated the effects of using wikis on the students writing performance in terms of accuracy, organization and cohesion. The scores obtained by the participants writing pre- and post-test were compared. The results obtained are presented in accordance to the research questions, beginning with the first research question and the further analysis for the rest of the questions.

In order to answer the first research question (Will there be a significant improvement in the students’ performance in the post writing test regarding the accuracy and quality of their writing?), descriptive analysis and paired samples t-tests were used to investigate any statistically significant differences in results in the post-test compared with those of the pre-test for both groups. For the control groups, Table 2 below reports the paired samples t-test results for accuracy, quality and total writing scores.

Table 2. Paired t-test results for control group (differences between pre- and post- test)

Group	Variable	Test	No.	Mean	St. Deviation	t value	Sig.(2-tailed)
Control Group	Accuracy	Pre	20	8.2500	1.2513	7.094	0.000**
		Post	20	9.6500	0.9333		
	Quality	Pre	20	8.2500	1.0195	13.309	0.000**
		Post	20	9.9500	0.9445		
	Total	Pre	20	16.500	1.6059	11.897	0.000**
		Post	20	19.600	1.2311		

**significant at 0.01 level

Table 2 shows that the performance of the students in the control group improved significantly in accuracy [$t = 7.094, p=0.000$], quality [$t = 13.309, p=0.000$], and total score [$t = 11.897, p=0.000$]. There are significant differences between the two performances in favor of the post-test scores at the level of $p<.01$. These results might be due to the period of conducting the study as it comes at the end of the academic year. The students who participated in this study, as mentioned before, study in an intensive English course twenty hours per week. Also, the post-test was conducted two weeks before the final exams period.

Table 3. Paired t-test results for experimental group (differences between pre- and post- test)

Group	Variable	Test	No.	Mean	St. Deviation	t value	Sig. (2-tailed)
Experimental Group	Accuracy	Pre	22	8.2727	1.2792	12.394	0.000**
		Post	22	11.954	1.7037		
	Quality	Pre	22	8.2727	1.0319	25.118	0.000**
		Post	22	13.000	1.3452		

Total	Pre	22	16.545	1.9695	22.126	0.000**
	Post	22	25.000	2.3503		

**significant at 0.01 level

Table 3 reveals that the experimental group improved significantly in all aspects of writing performance as there were significant differences in accuracy [$t = 12.394, p=0.000$], quality [$t = 25.118, p=0.000$], and total score [$t = 22.126, p=0.000$] at the level of $p<.01$ in favor of the post-test results. These results also might be due to the period of applying the study. However, the margin of the mean scores between the mean scores in the pre-test and the post-test is higher in the experimental group than in the control group.

These results of both groups showed that there were significant improvements in the writing performance over time. However, the treatment effects were investigated in relation to the second research question (Are there any significant differences between the two groups in the post-tests in relation to the treatment?). In order to answer the second research question, an analysis of covariance (ANCOVA) was conducted partialling out the pre-test scores. The ANCOVA test was viewed as being more appropriate for comparing why there may be differences between the effects (Wright, 2006), and for being a more powerful procedure (Oakes & Feldman, 2001). As Wright (2006) stated, 'the ANCOVA is appropriate more often than t-test on the differences' (p. 674).

Table 4. ANCOVA tests for the groups post-test results after controlling the pre-test effects

Item	Variable	Group	No.	Mean	St. Deviation	F	Sig.
Writing Performance	Accuracy	Control	20	9.6500	0.9333	48.992	0.000**
		Experimental	22	11.954	1.7037		
	Quality	Control	20	9.9500	0.9445	66.688	0.003**
		Experimental	22	13.000	1.3452		
	Total	Control	20	19.600	1.2311	122.709	0.000**
		Experimental	22	25.000	2.3503		

**significant at 0.01 level

Table 4 shows that there were significant differences between the experimental and control group in the post-test controlling the pre-test scores at the level $p<.01$. The differences occurred in the three scores of accuracy [$F=48.992, p=0.000$], quality [$F=66.688, p=0.003$], and the total scores [$F=122.705, p=0.000$]. The strongly significant differences occurring in the students' post-test writing performance support the claim that using wikis can improve students' writing performance. The results will be discussed next in relation to the literature.

6. Discussion

In aiming to investigate the effects of using wikis on the students' writing performance, the study first asked whether or not there would be a significant improvement in the students' performance in the post writing test regarding the accuracy and quality of their writing. As discussed above, students in the control group as well as the experimental group improved in accuracy, quality, and overall score (Table 2 and Table 3). Despite the improvement in both groups, the margin of the mean scores between the mean scores in the pre-test and the post-test is higher in the experimental group than in the control group suggesting that it is related to the treatment, as the ANCOVA revealed. It is important to note that the study was conducted at the end of the academic year and this might be the reason for the significant results in both groups.

Secondly, the study asked whether or not there would be any significant difference between the two groups in the post-tests in relation to the treatment. Findings suggest that there were significant differences in accuracy, quality, and total scores between the experimental and control group in the post-test (Table 4). These findings are in line with previous research suggesting wikis are an effective technological tool for enhancing student writing performance (Kuteeva, 2011; Lin, 2005; Kennedy, 2010).

In agreement with Kuteeva (2011) who found that using the wiki for writing activities made students pay closer attention to grammatical correctness and structural coherence, this study shows that learning through wikis helped the subjects improve their accuracy and quality of writing. While Coniam and Mak (2008) found that the use of wikis did not always improve writing accuracy, this study suggests learning using wikis is effective in improving the

subjects' accuracy in their writing. Other research, such as Miyazoe and Anderson (2009) and Alshalan (2010), found that wikis can have general overall success in improving student writing quality. While more research is necessary to pinpoint ^{准确描述} specific accompanying pedagogies which might improve the chances of a positive outcome, it is encouraging that the experimental group's quality of writing improved over all.

It is expected that the margins of difference would be larger between the control group and the experimental group if the students were more advanced. The students participating in this study were level 2 high beginners and are, therefore, only expected to describe aspects of their life in simple terms. It would be expected, however, that a study involving level 4 or 5 upper-intermediate students would result in the margin being higher because they are expected to write longer essays with more sophisticated ^{复杂的} language. Students at this level should be producing clear well-structured text on complex subjects. The collaborative learning environment inherent in the wikis would more greatly benefit these advanced students as they are better prepared to use their language skills in an autonomous environment.

Although the collaborative nature of the wiki experience was not specifically studied in this research, it is expected, as found by Lin (2005), that a learning environment that supports collaboration is one aspect of the wiki that works to improve writing ability. Students engaging in the process of writing through the wiki are not just correcting each others mistakes, but are also discussing ideas. Through such discussions a greater awareness of English language usage and word choices emerges. Additionally, the peer review used in this study added to the benefits of the wikis in that students expected their classmates to assess their final presentation.

Being student-centered, wikis allow students to work together and collaborate on their work without the strong presence of the teacher. By facilitating such student interaction outside of the presence of the teacher, students may feel more comfortable expressing their opinions, commenting on others' work, and discussing new ideas, as suggested by Reo (2006). Such peer assessment plays a critical role in overall improvements in writing ability. Similar to this study, Xiao and Lucking (2008) found that students using wikis demonstrated greater improvement in their writing and reported greater satisfaction with the peer assessment method.

Such collaboration also has implications regarding the motivational aspects of the wikis and the procedures followed which make activities more appealing. As discussed by Bubas, Kovacic and Zlatovic (2007), the novel and innovative nature of wikis can capture the interest of students thereby effectively engaging them in the learning process. This enhanced motivation and engagement in the learning process can lead to improvements in their language skills, such as writing.

In light of the literature which provides concrete evidence that wikis promote collaborative work among students and improve writing performance, Kennedy (2010) suggests that teachers learn to understand how students today engage with the world around them. Web connected students who regularly interact with online applications that encourage public writing produce knowledge and engage with peers in ways perhaps incongruous with traditional teaching methods. As discussed by Coyle (2010), a key challenge in the effective use of wiki technology is the gap between teacher and student knowledge in regard to computer based learning applications.

7. Implications and Recommendation

As both the control group and the experimental group demonstrated improvements in their writing performance, further research conducted at the beginning of the academic year would help to differentiate the benefits gained from the wiki and those from a year of study using traditional methods. Additionally, as students completed the study two weeks prior to final exams, there was most likely already a high level of competence in preparation for these tests.

As mentioned previously, future research using wikis with higher level students who are able to write longer essays and engage more dynamically with the wiki tool would be useful in developing a more comprehensive understanding of the benefits that can be gained from this style of language learning. Although the competency of Preparatory Year students was sufficient to make determinations regarding the effect of the wiki on writing ability for the purposes of this research, a larger difference in ability could be determined given a wider range of language performance activities.

Another research suggestion is to look closely into the learners' language production in terms of fluency, complexity, and accuracy. This research focused on students' accuracy and quality in writing performance. Greater understanding of other aspects of English language form and function in relation to acquisition via the wiki will help fine tune not only the wiki application itself but also how the teacher uses the application in relation to other class activities. While the wiki has proven to be an effective tool in supporting student collaboration, motivation, and English language learning, more research is needed to fully understand the complete spectrum of strengths and weaknesses inherent in the use of wikis in the EFL classroom.

8. Conclusion

By engaging students in a collaborative learning environment such as the wiki, this study found that students are able to improve their writing ability. While many teachers utilizing wikis may have a positive perception of the tool and the impact it has on their students, research such as this that demonstrate the quantitative gains in knowledge are crucial in designing new teaching methodologies. This research, being conducted with Preparatory Year students, provides evidence of the tool's usefulness in improving writing ability, but further research with higher level proficiency students would strengthen the findings described here. There is no doubt that educators throughout the world will continue to employ not only wikis, but all types of Web 2.0 technologies. Greater confidence and empirical evidence as to the benefits of such technologies will hopefully help students and teachers grow in their aptitudes and acceptance of creativity in learning.

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