

The effect of online collaborative project-based learning on English as a Foreign Language learners' language performance and attitudes

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Abstract

The present study investigated the effect of online collaborative project-based learning on the language performance and attitudes of intermediate level students at the College of Applied Sciences in Oman. The study is a quasi-experimental study and the sample consisted of four classes (93 students in total) in Nizwa College of Applied Sciences. These participants were in their foundation year and were taking the Academic English Course during the time of the research experiment. Two classes were assigned to the experimental group (46 students) and they were directed to collaborate online in doing their research projects. The other two classes were assigned to the control group (47 students) and did their projects individually. A language test containing reading and writing questions, an attitude questionnaire, students' project scores and transcripts of focused group discussions were used to collect the data needed to answer the research questions. The study revealed that the main positive effect of online collaborative project-based learning was clear on students' writing skill in the post test (i.e. students in the experimental group outperformed students in the control group).

Introduction

An increasing number of research findings report that using 21st century information and communication tools such as the Internet can influence learning processes and products positively (Cradler et al., 2002). Getting students to interact with technology to complete research tasks allows the integration of curricular goals with online environments (Huffman, 2010). These advantages have encouraged many institutions and educators to use the Internet for e-learning: learning that is delivered and supported by the use of information and communication technologies. E-learning can take many forms such as computer assisted instruction, computer assisted learning and computer based training (Clarke, 2008). Nowadays, e-learning can provide effective educational opportunities and individualized support to all students (Watson, 2008). It is useful in increasing learners' comprehension and in providing deeper engagement with content. It is also useful in raising students' motivation towards learning and in increasing collaboration between students and teachers (Coomey & Stephenson, 2001). Indeed, in the modern context, basic literacy includes not only the ability to read and write, but also the ability to extract meaning and communicate ideas through various multimedia (Lee, 2004).

The Omani government has been highly committed to developing education, and has made many resources available for use at colleges and in public schools. The Omani educational system has undergone massive reform over the past four decades; this reform enables students who come from the

basic education systems into higher education colleges to come with experiences, expectations and abilities that can enable them to take part in Computer-Supported Collaborative Learning (CSCL). Efforts are already taking place to introduce more collaborative knowledge building practices in Oman; nevertheless, more support for students and faculty is still needed to encourage the use of CSCL tools in order to enhance this collaborative knowledge-building (Porcaro, 2011). Many researchers have recommended using project-based learning (PBL) as one way of learning and promoting various communication and collaboration skills (Tims, 2009; Pacific Policy Research Center, 2010; Patton, 2012). PBL is an instructional model that organizes learning around projects (Thomas, 2000). It is "a student-driven, teacher-facilitated approach to learning" (Bell, 2010, p. 39), whereby students drive their learning through inquiry and collaborative work to investigate topics in order to reflect their knowledge (Bell, 2010). It is closely related to inquiry learning and constructivist learning (Lam, 2012). The use of projects is well established in education and it has recently developed into a formally defined teaching strategy. Projects are very useful because they put students in active roles such as problem solvers, decision makers or investigators. They also aid the achievement of many educational goals (Intel, 2007).

Research on PBL shows that technology enables the development of critical thinking skills when students use technology tools to communicate, present and publish their projects, especially when they use technology with collaborative learning techniques (Cradler et al., 2002). In addition, computer-mediated communication (CMC) tools such as discussion boards and e-mail (Thomas, 2002) can provide an online environment for small group collaboration where a record of all interactions is automatically saved, allowing students to reflect upon both the products and process of collaboration. They can also interact and use peer assessment to support each other (Lee et al., 1999); CMC can provide support for tracking contributions and monitoring and evaluating individual and group effort (EDUCAUSE, 2010).

PBL requires the production of authentic language from English language learners, as students investigate a variety of topics, produce their own reports and present them in oral or written forms. This can lead to the development of academic vocabulary and the acceleration of language acquisition (Stripling et al., 2009). In addition, providing chances for students to work collaboratively in project-based activities fosters further interest in learning the language, ideally leading to positive effects on the learners' attitudes and motivation towards learning the target language (Huffman, 2010). Over the past decade many calls for reform in higher education have highlighted that education should become less instructor centered and that students should take a more active role in their learning. The pressure on university professors has increased to integrate technologies and Internet based applications to encourage active engagement of students (Thomas, 2002). The present authors believe that activating online collaborative PBL can enhance the integration of technology with the curriculum, promote active learning and help in improving students' English language performance.

Sharan & Sharan (1992, as cited in Schlais & Davis, 2001, p.116) have stated that one of the central objectives of higher education in colleges and universities is critical thinking with an emphasis on lifelong learning and learning to learn. They believe that collaborative learning can provide the framework for developing this ability.) Online collaborative PBL can support students in their language learning because web based tools allow storing information in an organized way for future reference (Koufman-Frederick et al., 1999); PBL also encourages collaboration between students and engages students in long-term projects, which make learning meaningful and interesting. In the Omani context, there is a shortage of studies that investigate the effect of using online collaborative PBL on learners' language performance and attitudes. This study tries to address this gap by investigating the effects of using online collaborative PBL on EFL students' language performance and attitudes. More specifically, this study will try to answer the following research questions:

- 1) Is there a significant difference in students' writing performance between the control and experimental groups after using the online collaborative PBL?
- 2) Is there a significant difference in students' reading performance between the control and experimental groups after using the online collaborative PBL?
- 3) Is there a significant difference in project performance between the control and experimental groups after using the online collaborative PBL?
- 4) Is there a significant difference in students' attitudes towards learning English between the control and experimental groups after using the online collaborative PBL?
- 5) What are the opinions of the students in the experimental group about online collaborative PBL in terms of:
 - A. Its benefits.
 - B. The challenges they faced in its application.
 - C. Their recommendations for maximizing project online collaboration.

Purpose of the study

The study aimed to examine whether using the online collaborative PBL method as opposed to the use of a traditional (offline, individual) approach had a positive impact on students' language performance and attitudes towards learning. Also, it aimed to gain insight into students' perceptions towards collaborating online in doing projects by investigating their opinions about the benefits and the challenges they encountered while collaborating online.

Review of literature

PBL is an instructional model that organizes learning around projects (Thomas, 2000). Tims (2009) defines it more specifically as

an instructional approach that allows theory to be transformed in practice through the use of meaningful hands-on activities that are called projects (p. 20).

PBL can be designed to engage students in investigations of problems to produce authentic products (Intel, 2007). The benefits of PBL are maximized by integrating it with collaborative learning. PBL and collaborative learning are highly compatible and supportive to each other for effective implementation in the classroom. In this context, students with varying levels of knowledge and prior experience work together in small groups toward a common goal (Lou & MacGregor, 2004).

In traditional classroom settings, researchers have shown that using project-based, collaborative assignments fosters greater depth of learning (Ellis & Hafner, 2008). Various reports also strongly suggest that knowledge created collaboratively is more likely to be recalled (Freedman, 2009) and learners can gain more profound comprehension of various topics (Yang & Wu, 2011). Getting students to work together also promotes more positive attitudes toward learning and towards the subject area than individualistic learning (Johnson et al., 1998). Thomas (2000) reviewed the available research on PBL and found evidence that the academic achievement of students who use collaborative PBL is equal to or better than the achievement of students who use other learning methods.

Several studies have established the usefulness of PBL and online collaborative learning in countries such as the USA (Changwatchai, 2006), Hong Kong (Choi, 2008), Thailand (Simpson, 2011), and Oman (Al Kindy, 2007; Al-Abri, 2009). Changwatchai (2006) investigated graduate-level students' expectations and perceptions of a collaborative online learning environment in an online course that emphasizes

collaboration in The University of Texas at Austin. The researcher stated that all students with previous collaborative online learning preferred collaborating online over collaborating face-to-face. Students who strongly preferred to work alone, on the other hand, considered collaboration a time-consuming activity. Students expected their peers to be cooperative, honest, responsible, open, willing to share, and willing to provide constructive feedback. Students who worked with students they perceived as having these qualities felt satisfied with their groups, while those who worked with students who they considered did not have these qualities felt disappointed and not satisfied with their group. The main challenges that faced students in their online collaboration were the lack of group and individual accountability. The researcher stated that students should be informed about the desired behaviors before the semester starts in order to reduce students' frustration.

Choi (2008) also investigated students' feelings and attitudes towards the use of online collaboration in English as a second Language (ESL) writing. The sample of the study consisted of a class with 36 higher diploma (intermediate level) students from a community college in Hong Kong. The students took part in three online collaborative writing tasks and worked in groups during the research experiment. A questionnaire, an interview, reports of the peer observer, student's written work and reflective summaries were used for collecting the data for the study. The results indicated that using online collaboration in ESL writing lessons had positive effects on students. The questionnaire showed that students were generally motivated and enjoyed the supportive atmosphere because it decreased their stress, which led to promoting their positive attitudes towards writing. The study also revealed that some students had reservations about the effectiveness of peer feedback. This was due to that fact that some students were passive and unwilling to give their comments, and did not provide any responses to their peers. Some students tended to give very general comments or comment on grammar points only. The study suggested that this might be as a result of the lack of former online experience in doing the writing tasks.

Simpson (2011) investigated the influence of integrating PBL in an English Language classroom in a Thai university. The focal sample consisted of 26 students (out of a population of 60) third year English major students. These 26 students were taught through PBL method and the other students were taught by the traditional method for one semester. During the research experiment, students of the experimental group designed travel brochures through various drafts before designing the final product. The data for the study were collected from students' surveys, project diaries, open-ended questionnaires, field notes, TOEFL results and language test. The results showed that PBL had a statistically significant effect on the development of English language skills, especially of low and medium achievers (except in the structure and written expressions of low achievers). The researcher also reported that higher achievers at the end of the study showed progress in speaking and writing but not statistically significant improvement in reading and listening.

In Oman, Al Kindy (2007) investigated the effect of using pair and group feedback in comparison with teachers' feedback in correcting grade 11 writing tasks. One school was selected randomly and three classes in this school participated in the research experiment. The first class was assigned to the experimental group and used teacher and pair feedback, the second class was also assigned to the experimental group and utilized teacher and group feedback. The third class was assigned to be the control group and only teacher feedback was used in correcting students' writing tasks. A pre and post writing test was used for collecting the needed data for this study. The results revealed that there was no significant difference between students who received pair feedback and students who received group feedback in the writing posttest. However, the results revealed a significant difference between students who received pair or group feedback and students who received teacher feedback only, in

favor of the pair and group feedback. The semi-structured interviews revealed that students perceived that integrating peer feedback with teacher feedback was more useful and effective than receiving feedback from the teacher only.

In another study in Oman, Al-Abri (2009) investigated the effect of using Moodle based activities such as wikis and e-forums on the writing performance and attitudes of Omani students. The sample of the study consisted of two grade twelve classes taking English Elective Course in a girls' government school in Oman. The experimental group consisted of 26 students and the control group consisted of 25 students. The experimental group was taught English by using Moodle and students were required to write several drafts of the writing tasks. They were required to self-edit their work and then to edit each other's work in peers and groups. The control group was taught by the traditional method. The researcher used a writing test and a questionnaire as instruments for collecting the data for this study. The study revealed that there was a statistically significant difference in learners' writing achievement in favor of the experimental group. The experimental group had better results than the control group in writing task achievement and language accuracy in the posttest. The experimental group also reported positive attitudes towards learning the writing process by using Moodle based activities.

Thus, in their studies, Al Kndy investigated the effect of using peer feedback on students' writing performance, Al-Abri investigated the effect of using online collaboration in variety of online activities on students writing performance. In the current study we investigated the effect of using online collaboration on long-term projects on students' language performance in reading and writing skills, as well as students' attitudes towards learning English before and after the intervention and their attitudes towards collaborating online in long term projects.

Methodology

This quasi-experimental study used a pre/post test control group design to test the effect of online collaborative PBL on students' language learning performance and attitudes. The study was conducted in Nizwa College of Applied Sciences in the second semester of the academic year 2012-2013. Selection of the participating classes depended on the willingness and readiness of the instructors of these classes to collaborate with the researcher in making the success of the research experiment possible. The instructors in this college had access to computer labs with their students for two hours weekly as part of the Academic English foundation course. This provided a chance for their students to apply online collaborative PBL for about one hour every week. The purpose of the project was to get students do research work, write reports and then present them orally; students had not participated or collaborated offline in a long term project before this experimental approach at the college level. The actual experiment started in week 4 of the second semester and ended in week 14. Thus, the experimental approach lasted for about eleven weeks.

The population of the study consisted of all the 255 intermediate level students (level A) who were taking the Academic English foundation course in Nizwa College of Applied Sciences. The sample consisted of four intact classes (93 students: 20 males and 73 females); two classes were assigned to the experimental group (46 students: 10 males, 36 females) and the other two classes were assigned to the control group (47 students: 10 males, 37 females). The classes were not segregated by gender. In this quasi-experimental study, students in the control and experimental groups were required to do some library, internet and real-world research such as interviewing people. The topics that students had to write about were curricula-related, namely: modern technology, scientific developments, the environment, famous people, studying abroad, and comparing between countries. The control group

received conventional instruction in their English lessons, they wrote research projects individually and they received feedback from their teachers only. The experimental students interacted and collaborated online to accomplish their research projects and they received feedback from their peers as well as their teachers. The students worked in groups of three to six to complete their projects. They were allowed to revise each other's drafts and provide feedback before submitting their drafts and final reports for grading. The assessment criterion for the written reports is based on the overall task achievement of producing the drafts. Students are assessed on the submission, structure, organization, language mechanism and referencing in their final drafts. In the current study, the four instructors of the control and experimental group marked the projects of their students at the end of the semester, using the college assessment criteria to ensure fairness of the marks given.

Students in the experimental group used two online platforms for their interaction and collaboration; Blackboard discussion forums and iEARN Youth Forum. To be able to better control the experiment, to follow up on each group's interaction effectively and to assess students' individual contributions in writing the reports, the discussion of the projects and group feedback were captured in the Blackboard virtual learning environment. This interaction with other students was encouraged in order to help them acquire and retain language through discussion. In the iEARN Youth Forum, students introduced themselves, discussed general difficulties and reflected on their online collaborative PBL experience.

Research instruments

To answer the first two research questions, quantitative data were collected through a language test containing reading and writing questions (see Appendix). In addition, students' projects' scores were also used to obtain data related to the third research question. An attitude scale was developed and administered to answer the fourth research question. To obtain qualitative data for this study, messages' transcripts of individual and focused group discussions were analyzed to answer the fifth research question. The data were collected through these instruments to fulfill the purpose of this study.

Results of the Study

Writing pre-test and post test of the experimental group

A paired samples t-test was conducted to compare the writing pre-test and post-test scores of the experimental group. Table 1 indicates that there is a significant difference at the .05 level in the mean pre-test scores (M=62.34, SD= 8.25) and post-test scores (M= 68.78, SD= 8.95) for the experimental group. The results indicate that the students in the experimental group gained higher scores in the writing post-test compared to their pre-test.

Table 1: Paired samples t-test results for pre and post writing text scores (experimental group).

Experimental group	N	Mean*	Std. dev.	t-value	Sig. (2-tailed)
Pre-test	41	62.34	8.245	4.438	.000
Post-test	41	68.78	8.954		

* Maximum possible score = 100

Writing post test of the experimental and control groups

In the current study, the treatment of the two groups was different in two respects: collaborative/individual work, and using/ not using online media. An independent samples t-test was conducted to compare between the experimental and control groups in the writing post test after the intervention (see Appendix for writing question). Table 2 indicates that there was a significant difference between the scores of the control group (M=62.74, SD=9.21) and those of the experimental group (M=68.78, SD=8.95) at the .05 level in favor of the experimental group.

Table 2: Independent samples t-test: post writing scores compared.

Group	N	Mean*	Std. dev.	t-value	Df	Sig. (2-tailed)
Control	38	62.74	9.211	2.956	77	.004
Experimental	41	68.78	8.954			

* Maximum possible score = 100

These results suggest that online collaborative PBL can have an effect on students' writing performance. Specifically, the results suggest that when students use online collaborative PBL, their writing skills improve more than when they work individually and offline. Students of the experimental group put some effort in revising and commenting on their peers' written projects, which helped them to build up knowledge together. Thus, it seems that using online collaborative PBL increased students' ability to apply skills of essay writing in their writing test. Analyzing the writing post test results of students in more detail indicates that discussing and collaborating in projects had more influence on students' ability to recall and apply the use of grammar, paragraph organization, writing longer texts and using a wider range of vocabulary to complete the writing task. This result is supported by researchers who suggest that collaborative knowledge creation increases students' ability to recall knowledge (Freedman, 2009), increases long-term retention (Johnson & Johnson, 1987; Matthews et al., 1995; Adams & Hamm, 1996; Hijazi & Al-Natour, 2012) and improves students' writing performance (Al Kindy, 2007; Al-Abri, 2009; Simpson, 2011).

Moreover, analyzing individual student contributions on Blackboard indicated that most of the comments provided were related to grammar. Other comments were related to adding more information and ideas in order to reach the specified word limit in their projects. Many students also advised their peers to write more supporting ideas, organize their essays, check vocabulary usage, correct spelling, check punctuation and add topic sentences. They also sent encouraging comments to their peers and provided them with positive feedback to motivate them to work harder. Some of them also wrote appreciation comments to their peers thanking them for their good essays and for their supporting feedback. Only very few students asked questions to get support from their peers or advised their peers to self-correct their mistakes and to do more reading in order to enrich their essays with more ideas. In general, it can be concluded here that discussing issues related to grammar, vocabulary usage, using topic sentences and adding supporting ideas and information had a positive effect on students.

Reading test

The researchers administered a reading post test to the control and experimental group and conducted an independent samples t-test on their scores in order to answer the second research question (see Appendix for reading questions). Table 3 shows the results of the independent samples t-test of the control and experimental groups in the reading post test.

Table 3: Independent samples t-test for post reading scores of the two groups.

Group	N	Mean*	Std. dev	t-value	Df	Sig. (2-tailed)
Control	38	68.03	18.728	.290	77	.773
Experimental	41	69.15	15.568			

* Maximum possible score = 100

The results show that there is no statistically significant difference at the .05 level between the means of the reading posttest scores of the two groups. This result could be attributed to the fact that students in the experimental and control group were both involved in reading activities to enrich their projects. The students in the experimental group were also asked to read their peers drafts during lecture time; however, it seems that they did not have enough time to read many drafts within the time available for them. In addition, in doing their projects, students in both control and experimental groups had to find their own resources and that depended on the students' individual efforts. This may have caused the insignificant difference between the two groups. It seems that in order to compare between the two groups in a more sound way, the amount and types of readings done by both groups would need to be prearranged and planned beforehand. Moreover, in order to increase the impact of online collaborative PBL on students' reading performance, the researcher suggests providing more time for students to practice collaborative reading.

During the research experiment, students had to produce written paragraphs; and students in the experimental group had also to use their peers' comments in editing their paragraphs. Going forward, and in order to make sure that collaboration is useful in improving reading (a receptive skill), it seems that students need to be intensely involved in answering comprehension tasks collaboratively, in order to ensure students' full involvement in the reading and collaboration processes. This would provide better evidence of the amount of collaboration done by students in reading.

In conclusion, in order to observe the difference between the control and experimental group in the reading performance, more time should be provided for students to engage with reading tasks during lecture time. Reading activities should be provided by instructors to ensure that all students get a good range of reading materials. In addition, some reading tasks should be used in order to ensure that students read actively and collaboratively.

Overall project scores

An independent samples t-test was also used to answer the third research question. Table 4 shows that there was no significant difference in the mean scores of the control group (M=18.55, SD=3.83) and experimental group (M=18.57, SD=3.65) at the .05 level. These results suggest that online collaborative PBL did not have a significant effect on students overall achievement in their projects. Students in the experimental group received feedback from their peers and from their instructors in their projects and students in the control group received feedback from their instructors only. It seems that getting constructive feedback, irrespective of who provided this feedback, helped students to improve their written projects in both the experimental and control group.

Table 4: independent samples t-test: project scores for the two groups.

Group	N	Mean*	Std. Dev.	t-value	Sig. (2-tailed)
Experimental	46	18.57	3.655	.015	.988
Control	47	18.55	3.838		

* Maximum possible score = 25

It should be noted, however, that having teacher and peer feedback together may well have contributed to the experimental group's writing scores (see above).

English language attitudes

Table 5 shows that there was no significant difference at the .05 level in the mean scores of the control group (M=95.26, SD=6.31) and experimental group (M=92.74, SD=12.07) in their attitudes towards English. These results suggest that online collaborative PBL did not have a significant impact on students' attitudes towards learning English. The difficulties that students faced in their online collaboration in projects could be the reason for this lack of effect. However, it is important to mention that students' attitude remained positive after the experiment. This can be attributed to the fact that students in both the experimental and control groups were aware of the importance and usefulness of English language despite the method used and despite the difficulties they faced in learning.

Table 5: Independent samples t-test: English language attitude responses from the two groups.

Group	N	Mean*	Std. dev.	t-value	Df	Sig. (2-tailed)
Control	31	95.26	6.314	1.041	63	.302
Experimental	34	92.74	12.069			

Learners' opinions about online collaborative PBL

Analysis of the online messages posted by students in the experimental group revealed that students in the experimental group regarded using online collaborative projects as a useful means in enhancing communication and interaction with other students. They regarded it as an educational opportunity to improve their English skills and it allowed them to gain more knowledge about writing mechanisms, vocabulary and grammar. Example student comments include: "we learn many things. We can learn many rule such as grammar and writing"; "we exchange opinions. We knew a new vocab" and "we like communication with other people...". This is in line with the results of their writing test, in which they gained better results in grammar and vocabulary usage than the control group. The results are also in line with other studies (Lou & MacGregor, 2004; Choi, 2008) in which students also regarded collaboration as a useful means for enhancing knowledge and understanding and for improving the writing skill.

On the other hand, students stated that they faced various difficulties in their online collaboration to complete the projects. Some students wrote "we didn't have much time to chatting and sometimes internet is not available". Another group (of boys) wrote "NOBODY replays to my topic. I don't know why?" and another group (of girls) wrote:

some people don't explain their ideas and sometime we founded some difficult on their language such as when they communicate with us [...] sometimes we don't understand their ideas".

In the current study, students were asked to use English only, so they faced comprehension difficulties because many students lacked some language knowledge, which led to inaccurate language use. Some students also orally expressed their lack of confidence in their ability to support others due to their language level. That made them reluctant to post supporting comments to their peers. In addition, many students complained about the time issue. They expressed the view that class time was not sufficient to read other students' written projects, comment on them and post comments online. Some students did not consider collaborating online for projects a useful task; they thought it was difficult and

a waste of class time. This is in line with Huffman's (2010) finding that not all students favor using computer-assisted tasks and some regard them as tedious and complicated.

The challenges that students faced in this study match challenges mentioned by Changwatchai (2006). In that study, the researcher also reported that many students found online collaboration time-consuming and frustrating because of time delay and lack of responses from peers. To improve their English, some students preferred attempting other tasks such as games and competitions rather than collaborating online by revising each other's work and providing feedback to each other. For these students, the responsibility to support other students in their language learning was not a stimulating activity; rather they considered it as a tiring and difficult task. Lack of online collaboration culture in learning could be one reason for their negative attitude towards collaborating with other students. Moreover, although students were made aware that they would get incentives and certificates at the end of the experimental research, it seems online collaboration disconnected from formal assessment made some students feel indifferent to collaborating, as their collaboration or lack of it would not affect their final grade. Linking collaboration with formal assessment can prompt students to put more effort into their collaboration, as suggested by Ingleton et al. (2000) and Macdonald (2003). Unfortunately, it was not possible to assign marks for collaboration as part of formal assessment in the current study, owing to the researcher's lack of authority to adjust the rating scales approved by the Colleges of Applied Sciences and for other logistical reasons.

It is also important to mention that students' insufficient language knowledge, lack of training in how to give helpful feedback and lack of available time within class time, in addition to some technical problems, seemed to lead to many students providing general comments to their peers without clear examples or elaboration. This reduced the effectiveness of online collaboration in doing the projects. This result is consistent with the study of Choi (2008) which found that some students were passive and unwilling to give their comments. Some of Choi's students also tended to give very general comments or comment on grammar points only; and they had reservations about the effectiveness of peer feedback and that reduced the effectiveness of online collaboration. Moreover in the current study, it was noticed that some students delayed their writing tasks until the last minute, causing them to use the class time in writing their own drafts rather than in providing or getting support, and thus reducing the effectiveness of online collaboration. This is consistent with the challenge mentioned by Changwatchai (2006) in which the lack of group and individual accountability was a main challenge to online collaboration.

In the current study, students used various adjectives to describe their online collaborative PBL experience. The adjectives that they used were in line with the adjectives mentioned by other authors and researchers. For example, the students described their online collaborative experience as "enjoyable" (cf. Choi, 2008) and "active" (cf. Tims, 2009). They also described it using some negative adjectives such as "tiring", "difficult" (cf. Huffman, 2010) and "a waste of time" (cf. Changwatchai, 2006).

Thus, it seems that some students had negative attitudes towards online collaboration in projects. This can be attributed to a lack of extensive training in using online collaborative PBL and in using Blackboard discussion threads before the experiment, due to insufficient available time to provide such extensive training to students. Thus, some students found difficulties in using them. Extensive training is essential because, as Macdonald (2003) states, the process of online collaboration needs a lot of time and a lot of practice to develop.

In addition, students in this study worked in groups of about 4-6 students, except one group which had seven members. Most of the groups comprised of females only; however about two groups contained males and females. Analyzing students' online message transcripts revealed that larger groups, especially the group with seven members, collaborated and posted messages less than smaller groups (4-5 students in each group). The analysis also revealed that groups with mixed gender (male and females in the same group) collaborated less effectively than students with one gender only (male only or female only): students sent fewer or no comments at all to their peers of a different gender. As suggested by Khan (2006), this can be due to cultural and religious factors which make girls feel insecure in dealing with male students; in the present case, girls did not reply to boys, so some boys did not bother to send to girls but just interacted with boys.

Having to collaborate online in projects was all new experience for students. The students were from different specializations and from different areas of the country, so they were not that familiar with each other. Unfamiliarity with each other can cause communication difficulties (Curtis & Lawson, 2001), which eventually affects the amount and quality of collaboration among students. Moreover, in the Omani culture, males and females are segregated in schools in order to limit interaction between them. Thus, it seems that students were reluctant to interact with the opposite gender because the culture prohibits their interaction and because of shyness.

Students also provided some valuable suggestions regarding promoting online collaborative PBL experience. They suggested getting the full benefit of modern technology in enriching their projects with information. They emphasized the importance of using clear and simple language in their projects; and they also emphasized the importance of self-correction as a way of improving their own projects. They recommended sticking to a timeline in order to have enough time to provide feedback to peers; they also recommended that students need to take collaboration seriously by providing feedback to other members in order to get feedback about their own work. They insisted that asking questions is a key element in getting support. They also recommended interacting more and practicing English in online discussion forums in their free time in order to improve their language skills. Some of them stated that they prefer interacting with chat messengers rather than online discussion threads.

Conclusions and recommendations

Using online collaborative PBL is considered a useful method for enhancing active, meaningful and purposeful communication between students. It can enhance the learning of English language skills, especially the writing skill, as long as the students put enough efforts in their collaboration. In collaborating online in projects, students can face some challenges and obstacles connected to technical problems, Internet connectivity, language level and time issue. However, using this method is worthwhile because it can provide valuable online written information for instructors regarding students' language and interaction performance. This information can potentially be used for assessment purposes and for preparing remedial as well as supplementary plans which can be used to enhance students' learning. Thus, instructors are advised to try to anticipate and address the challenges rather than quitting using online collaborative PBL as a method for promoting language learning. Promoting collaboration among students is not an easy task because sometimes instructors and students resist using it (Ellis & Hafner, 2008). In addition, some students cannot contribute successfully to the group work because they lack the commitment or organizational skills (EDUCAUSE, 2010). Thus, for a better implementation of online collaborative PBL in the Middle East, students should get intensive training in face-to-face as well as online collaboration skills (i.e train them in getting and giving feedback

and in interdependence and accountability) and in providing language feedback and support to their peers. It seems that students in the Middle East collaborate more comfortably when working with students from the same gender, so it may be better to avoid mixing males and females within the same group.

This study was conducted as a quasi-experimental study involving an experimental as well as control group. It was applied synchronously within lecture time only. To gain more insight about its effectiveness in enhancing language performance, it is recommended that the study should also be conducted as a case study. In the case study, synchronous as well as asynchronous communication should be allowed for more active interaction among students. This study can also be conducted to investigate the effect of online collaborative PBL on low, average and high achievers' language performance and attitudes. This type of investigation will provide more information about the usefulness of this method in improving language performance of these students. It would also be useful to study separately the effects of collaboration and online media, for example by comparing with an offline collaboration (or online non-collaborative) approach.

Implications

- Getting students to work in online collaborative projects encourages them to construct new knowledge and not just to share information.
- Students need to be provided with adequate training regarding how to revise written text and how to provide feedback. This will make them more aware of their own mistakes and make them more able to support other students.
- Allocating enough time in class for students to collaborate on their projects is significant in order to get positive learning outcomes. It is also important to closely mentor the collaboration process and provide constructive feedback about its quality.
- Using synchronous as well as asynchronous communication can solve the problem of not having enough time during class, and can reduce the effect of technical problems inside computer labs. This will provide more time for them to read, reflect and provide more constructive feedback to their peers.
- In order to encourage students to take collaboration more seriously, teachers should link it to formal assessment by allocating some grades for collaboration. Rubrics can be designed and used to specify the collaboration behaviors that students need to practice in order to get the most of online collaboration.

References

- Adams, D., & Hamm, M. (1996). *Cooperative learning: critical thinking and collaboration across the curriculum* (2nd ed.). Illinois, USA: Charles C. Thomas publishers.
- Al Kindy, S. (2007). *The effectiveness of pair and group feedback on the writing performance of EFL students in Oman*. (Unpublished master thesis). Sultan Qaboos University, Sultanate of Oman.
- Al-Abri, B. (2009). *Effect of using process writing Moodle based activities for teaching writing on the writing performance and attitudes of Omani students*. (Unpublished master thesis). Sultan Qaboos University, Sultanate of Oman.

- Bell, S. (2010). Project-Based Learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39-43. <http://dx.doi.org/10.1080/00098650903505415>
- Changwatchai, J. (2006). *Student perceptions of a collaborative online learning environment*. ProQuest Dissertations and Theses. (UMI 3203511)
- Choi, J. W. (2008). The role of online collaboration in promoting ESL writing. *English Language Teaching*, 1(1), 34-49. <http://dx.doi.org/10.5539/elt.v1n1p34>
- Clarke, A. (2008). *Palgrave study skills: e-learning skills* (2nd ed.). Basingstoke: Palgrave Macmillan.
- Coomey, M., & Stephenson, J. (2001). Online learning: It is all about dialogue, involvement, support and control - according to the research. In J. Stephenson (Ed.), *Teaching and learning online, pedagogies for new technologies* (38-40). London: Kogan Page.
- Cradler, J., McNabb, M., Freeman, M., & Burchett, R. (2002). How does technology influence students' learning? *Learning & Leading with Technology*, 29(8), 46-50. http://www.dlc-ubc.ca/wordpress_dlc_mu/technologyandcurriculum/files/2011/10/Article.StudentLearning.pdf
- Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. *Journal of Asynchronous Learning Networks*, 5(1), 21-34. http://wikieducator.org/images/6/60/ALN_Collaborative_Learning.pdf
- EDUCAUSE (2010). *7 things you should know about assessing online team-based learning*. EDUCAUSE. <http://net.educause.edu/ir/library/pdf/eli7063.pdf>
- Ellis, T. J., & Hafner, W. (2008). Building a framework to support project-based collaborative learning experiences in an asynchronous learning network. *Interdisciplinary Journal of E-Learning and Learning Objects*, 4, 167- 190. http://www.editlib.org/p/44854/article_44854.pdf
- Freedman, T. (2009). Working together internationally. *Knowledge Quest*, 37(4), 56-60.
- Hijazi, D., & Al-Natour, A. (2012). Teachers' attitudes towards using cooperative learning for teaching English skills. *Interdisciplinary Journal of Contemporary Research in Business*, 3(12), 443-460.
- Huffman, S. (2010). *The influence of collaboration on attitudes towards English vocabulary learning*. Iowa State University. ProQuest Dissertations and Theses. (UMI 1476305)
- Ingleton, C., Doube, L., & Rogers, T. (2000). Leap into collaborative learning. University of Adelaide Centre for Learning and Professional Development. http://digital.library.adelaide.edu.au/dspace/bitstream/2440/71211/1/hdl_71211.pdf
- Intel. (2007). *Designing effective projects: Characteristics of projects, benefits of project-based learning*. http://download.intel.com/education/Common/pk/Resources/DEP/projectdesign/DEP_pbl_research.pdf
- Johnson, D. W., & Johnson, R. T. (1987). *Learning together and alone: Cooperative, competitive and individualistic learning* (2nd ed.). New Jersey, USA: Prentice-Hall, Inc.
- Johnson, D. W., Johnson, R. T., & Smith, K. A. (1998). Cooperative learning returns to college. *Change*, 30, 26-35.
- Khan, H. U. (2006). Role of Computer Mediated Communication in solving collaborative learning empowerment problems in higher education: a case study of Oman. *Innovation in Teaching and Learning in Information and Computer Sciences*, 5(4), 21-36.

- Koufman-Frederick, A., Lillie, M., Pattison-Gordon, L., Watt, D. L., & Carter, R. (1999). *Electronic collaboration: A practical guide for educators*. <http://www.brown.edu/academics/education-alliance/sites/brown.edu.academics.education-alliance/files/publications/elec-collab.pdf>
- Lam, S. (2012). Project based learning. In N.M. Seel (Ed.), *Encyclopedia of the Sciences of Learning*. (p. 2707). New York, USA: Springer Science + Business Media, LLC.
- Lee, K. (2004). *Effects of individual versus online collaborative case study learning strategies on critical thinking of undergraduate students*. ProQuest Dissertations and Theses (Accession No. 3128855).
- Lee, S., Groves, P., Stephens, C., & Armitage, S. (1999). *On-line teaching: Tools and projects*. <http://www.jisc.ac.uk/media/documents/programmes/jtap/jtap-028.pdf>
- Lou, Y., & MacGregor, K. (2004). Enhancing project-based learning through online between-group collaboration. *Educational Research and Evaluation*, 10(4-6), 419-440.
- Macdonald, J. (2003). Assessing online collaborative learning: process and product. *Computers & Education*, 40(4), 377-391. [http://dx.doi.org/10.1016/S0360-1315\(02\)00168-9](http://dx.doi.org/10.1016/S0360-1315(02)00168-9)
- Matthews, R. S., Cooper, J. L., Davidson, N., & Hawkes, P. (1995). Building bridges between cooperative and collaborative learning. *Change*, 27, 34-34. <http://dx.doi.org/10.1080/00091383.1995.9936435>
- Pacific Policy Research Center (2010). *21st century skills for students and teachers*. http://www.ksbe.edu/_assets/spi/pdfs/21_century_skills_full.pdf
- Patton, A. (2012). *Work that matters: the teacher's guide to project based learning*. <http://www.innovationunit.org/sites/default/files/Teacher's%20Guide%20to%20Project-based%20Learning.pdf>
- Porcaro, D. (2011). Reviewing the literature of computer-supported collaborative learning (CSCL) to determine its usefulness in Omani education development. *International Journal of Education and Development using Information and Communication Technology*, 7(3), 102-120.
- Schlais, D., & Davis, R. (2001). Distance learning through educational networks: The global view experience. In J. Stephenson (Ed.), *Teaching and learning online, pedagogies for new technologies* (p. 116). London: Kogan Page Limited.
- Simpson, J. (2011). *Integrating project-based learning in an English language tourism classroom in a Thai university*. (Doctoral dissertation). <http://dlibrary.acu.edu.au/digitaltheses/public/ad-acuvp309.29062011/02whole.pdf>
- Stripling, B., Lovett, N., & Macko, F. C. (2009). Overview of project based learning. In *Project-based learning: Inspiring middle school students to engage in deep and active learning (1)*. http://schools.nyc.gov/documents/teachandlearn/project_basedfinal.pdf
- Thomas, W. (2000). *A review of research on project-based learning*. http://www.ri.net/middletown/mef/linksresources/documents/researchreviewPBL_070226.pdf
- Thomas, W. R. (2002). *An analysis of student collaboration and task completion through project-based learning in a web-supported undergraduate course*. ProQuest Dissertations and Theses. (UMI3049238)
- Tims, N. R. (2009). *Project-based learning (PBL) in adult English as a second language (ESL) programs: Students' perspectives*. ProQuest Dissertations and Theses. (UMI 3391961)

Watson, J. (2008). *Promising practices in online learning, blending learning: The convergence of online and face-to-face education.*

http://rogersfoundation.org/system/resources/0000/0015/NACOL_promising_practices_in_blended_learning.pdf

Yang, Y.-F., & Wu, S.-P. (2011). A collective case study of online interaction patterns in text revisions. *Educational Technology & Society, 14*(2), 1-15. http://www.ifets.info/journals/14_2/1.pdf

Al-Rawahi, L.S. & Al-Mekhlafi, A.M. (2015). The effect of online collaborative project-based learning on English as a Foreign Language learners' language performance and attitudes. *Learning and Teaching in Higher Education: Gulf Perspectives, 12*(2). <http://lthe.zu.ac.ae>

Appendix

English Language Test

Reading Question : (30 minutes) _____ 20 marks

Read the text. Answer the following 20 questions . Write your answers in the answer sheet.

[1] Thomas Edison was an American inventor. He was born in 1847. He was the seventh and last child of Samuel and Nancy Edison. Edison had very little formal schooling as a child and he joined school for a few months only. His mother taught him reading, writing and math at home. Edison was always a curious child and he taught himself by reading on his own.

[2] Edison had to work at age thirteen as a newsboy, selling newspapers and candy, but he spent much of his free time reading books. By the time he was sixteen, Edison was expert in operating telegraphs and he worked as a full time telegrapher. The rapid growth in telegraph industry gave Edison a chance to travel and gain a lot of skills. In 1868, he changed his job from a telegrapher to an inventor by making an electric vote recorder. However, he failed in marketing his first invention because it was not useful for the public.

[3] In 1869, Edison continued working on inventions related to the telegraph. He developed his first successful invention, a stock printer, and he was paid a lot of money. This gave him the money needed to establish his first small lab in 1871. In the same year, Edison married 16-years-old Mary Stilwell who was an employee at one of his shops. **They** had three children before Mary's death at age 29 in 1884. In 1886, at the age of thirty-nine, he married the 20-years-old Mina Miller. In 1877, Edison made his first great invention ,the tin foil phonograph. It was the first machine that could record and reproduce sound. **This** device made Edison well-known all over the world. President Rutherford invited Edison to the White House to show its usage in 1878. Next, Edison invented his second great invention, an electric light. This electric light was a valuable tool because it was suitable for home usage and it was practical, safe and cheap.

[4] The success of this electric light took Edison to new heights of fame and wealth. In 1928, he received a special Medal of Honor for his inventions. In the late 1920s, his friends' Henry Ford and Harvey Firestone asked him to find an alternative source of rubber for use in vehicle's tires. However, when he was past eighty, he could not complete this work because he was in poor health. He suffered from a number of diseases and he died in 1931.

The text is adapted from about.com

Questions (1-4): Matching _____ 4 marks

Match the **paragraphs** to the following **headings**. Write the number of the paragraph next to each heading.

Question	The heading	Paragraph
No		
1	The last years of Thomas Edison's life	_____
2	Edison's great inventions	_____
3	Thomas Edison's early life.	_____
4	Jobs that Thomas Edison had	_____

Questions

(5-9): Writing Short Answers _____ 5 marks

Write **short answers** to the following questions.

5. Where was Thomas Edison born? _____
6. What was Thomas Edison's job when he was 16 years old? _____
7. What was Thomas Edison's first practical and cheap invention? _____
8. How many times did Edison get married? _____
9. How old was Edison when he invented the tin foil phonograph? _____

Questions (10-15): True or False _____ 6 marks

Write **(T)** and the line number next to the **correct** statement. Write **(F)** and the line number next to the **wrong** statement.

Question	The Statement	Answer
No.		(T/F)
10	Thomas Edison was the eldest child of Samuel and Nancy Edison.	_____
11	Thomas Edison was good in marketing all of his inventions.	_____
12	Thomas Edison sold newspapers when he was young.	_____
13	Thomas Edison received a Medal of Honor when he was 71 years old.	_____
14	Thomas Edison couldn't find an alternative source for rubber before his death.	_____
15	Thomas Edison was younger than 80 years old when he died.	_____

Questions (16-17): Matching _____ 2 marks

Match the definitions with the correct words in the text.

Question No.	Paragraph	Definition	The word
16	3	A worker who works for another person for a salary.	_____
17	3	very famous and known by many people.	_____

Questions (18-19): Matching _____ 2 marks

What do the following words refer to.

Question No.	The Word	Line Number	Answer
18	They	13	_____
19	This	15	_____

Question (20): _____ (1 mark)

20) Choose **the best title** for the text. Circle A,B,C or D.

- A. Thomas Edison's family
- B. Thomas Edison's life and inventions
- C. The great inventions of Thomas Edison
- D. Thomas Edison's first inventions

Writing question : (40 minutes) _____ (25 marks)

Choose **ONE** of the topics below, A or B. Write at least **150 words**.

- A) Write about two goals that you hope to achieve in the future. Why did you choose each goal? How will you be able to achieve each one? How will each goal change your life?
- B) Write about a special place for you. Describe the place. Why is it special to you? What does it remind you of? What do you usually do in that place?