THE UTILITY OF BLENDED LEARNING
IN EFL READING AND GRAMMAR:
A CASE FOR MOODLE [1]

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Abstract

This study examines the effect of Moodle-enhanced instruction on Jordanian EFL students' reading comprehension and grammar performance. The study uses a quasi-experimental, pre-/post-test design. A purposeful sample of 32 students, enrolled in a language requirement course at a Jordanian state university, was randomly divided into an experimental group (n=17) and a control group (n=15). The former used blended learning in which Moodle supplemented in-class instruction whereas the latter used in-class instruction only. Using means, standard deviations, ANCOVA and MANCOVA, the analysis revealed that the experimental group outperformed the control group (at $\alpha = 0.05$) in both reading comprehension and grammar.

Keywords: EFL; grammar instruction; Moodle; reading comprehension

1. Introduction and background

With the growing use of technology in education, institutions of higher learning shoulder the responsibility of availing teachers and students alike of the technological infrastructure for improved teaching and learning (Felix, 2003). Research to date (e.g., Ally, 2004; Baniabdelrahman, Bataineh & Bataineh, 2007; Bataineh & Baniabdelrahman, 2006; Fisher, Higgins & Loveless, 2006; Harris, Mishra & Koehler, 2009) suggests that technology is a catalyst for teaching and learning, as it supports users with innovative, learner-paced opportunities for learning (Fisher, Higgins & Loveless, 2006).

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Recent studies (e.g., Al-Maini, 2011; Bahrani, 2011; Bataineh & Bani Hani, 2011; Blake, 2013; Erben, Ban & Castañeda, 2008; Gilakjani, 2014; Ilter, 2009; Levine, Ferenz & Reves, 2000; Stanley, 2013; Ybarra & Green, 2003) also suggest that technology is advantageous in language teaching and learning, as it creates authentic contexts (e.g., Blake, 2013; Gilakjani, 2014; Stanley, 2013), offers information about the language, creates communicative communities with other language users (e.g., Stanley, 2013), and facilitates the learning of the four language skills (e.g., Erben, Ban & Castañeda, 2008). Technology has also proved instrumental for teachers' delivery of knowledge and skills in a manner which suits their learners' needs (e.g., Morales & Windeatt, 2015). It is also a key to autonomous language learning (e.g., Benson & Voller, 2014; Lin, 2009; Salehi & Salehi, 2012; Wang & Vásquez, 2012; Zhao, 2003), not to mention constituting a tool for fostering teacher and learner motivation (e.g., Gilakjani, 2014).

Blended learning does not have a unanimous single definition (Jonas & Burns, 2010; Marsh, Pountney, & Prigg, 2008; Stacey & Gerbic, 2008). However, it is generally defined as learning which "combines face-to-face instruction with computer mediated instruction" (Graham, 2006, p. 27) or the thoughtful fusion of face-to-face and online learning experience (Garrison & Vaughan, 2008). It encompasses both in-class instruction and Internet-based teaching, as various teaching and learning methods (e.g., lecture, discussion, guided practice), modes of delivery (face-to-face vs. computer mediated), and modalities (e.g., synchronous vs. asynchronous) come together to improve teaching and learning.

The Modular Object Oriented Dynamic Learning Environment (henceforth, Moodle) is believed to be the world's most popular Learning Management System (LMS) for both learning and training in various disciplines, probably because it is user-friendly, open source, and free to download (Lambda Solutions, 2017). Moodle fosters traditional instruction through the provision of opportunities for further learning and teacher feedback outside the boundaries of the classroom (Al-Busaidi & Al-Shihi, 2010; Brandl, 2005; Cole and Foster, 2007; Coskun & Arslan, 2014; El-Seoud, Al-Khasawneh & Awajan, 2007; Soliman, 2014).

Researchers (e.g., Abu Naba'h, 2012; Lin, 2009; Nedeva, Dimova & Dineva, 2010; Nozawa, 2011; Wu, 2008) also suggest that Moodle is instrumental for language teaching and learning. It is believed to help learners develop their general language skills, pronunciation, vocabulary, and grammar (Levy, 2009; Lin, 2009). Moodle also helps teachers better manage their courses and communicate, both synchronously and asynchronously, with their students (Wu, 2008). Furthermore, it potentially enables learners not only to acquire knowledge and skills but also to transfer what they learn to other contexts (Nedeva *et al*., 2010).

Similarly, empirical research has shown Moodle as advantageous for EFL learners' proficiency and achievement in tertiary education (Alavi & Keyvanshekouh, 2012; Dwaik, Jweiless & Shrouf, 2016; Stanley, 2007; Sun, 2014; Zeng & Takatsuka, 2009). More specifically, Moodle is reported to contribute significantly to reading comprehension (Hsieh & Ji, 2013; Tsai & Talley, 2014; Yang, Gamble, Hung & Lin, 2014), and grammar performance (Plomteux, 2013; Şahin-Kızıl, 2014).

Moodle is used by most Jordanian universities to supplement traditional classroom instruction. Local research (e.g., Al-Shboul, Rababah, Al-Saideh, Betawi, & Jabbar, 2013; El-Seoud *et al*., 2007) reports favorable results for Moodle use in Jordanian universities. Jordan University of Science and Technology (JUST), from which the sample of the research is drawn, has used the LMS since 2007. The entire faculty and student population have access to Moodle through their institutional usernames and passwords. A detailed user manual, for both instructors and students, is also available on JUST website.

In traditional academia, instructors disseminate information face-to-face through lectures and discussion. However, not only can technology integration save precious class time, but it can also help instructors create interactive and collaborative opportunities to engage learners and improve learning. In other words, web-based resources untiringly disseminate information to learners at their own pace and convenience to achieve comprehension, competence, or mastery (Farrington, 1999).

However, despite serious efforts towards technology integration in this and other Jordanian universities, several barriers do exist. More often than not, the cost of technological innovations, which may prohibit their adoption in customarily resource-limited state universities, is easier to overcome than academic traditions (e.g., faculty-centered instruction) which often prevent instructors from using more learner-centered, computer-based instructional strategies. Similarly. limited logistic support to enable faculty to take full advantage of technology often inhibits large-scale technology integration into their teaching.

2. The current study

2.1. Problem, purpose, questions, and significance of the research

There seems to be a consensus among researchers that Moodle is beneficial in improving students' language proficiency (e.g., Abu Naba'h, 2012; Levy, 2009; Lin, 2009; Nedeva *et al.*, 2010; Nozawa, 2011; Wu, 2008). However, the current research is exploratory in nature, and generalizations are not sought.

According to Blake, Wilson, Cetto and Pardo-Ballester (2008), Brandl (2005), Coskun and Arslan (2014), and Al-Jarf (2005), courses that are a mixture of in-class and online instruction (e.g., Moodle) are effective for developing English language proficiency. However, these researchers have noticed a general reluctance for Moodle utilization among Jordanian language instructors despite adequate technological infrastructure. Some instructors used Facebook and WhatsApp instead of Moodle even though these do not provide users with the same services Moodle does. Hence, the researchers designed a treatment using Moodle supplementation to in-class instruction to examine its effect on EFL students' reading comprehension and grammar performance at Jordan University of Science and Technology.

To achieve the purpose of this study, the following questions are addressed:

1. Are there any statistically significant differences between the experimental and control group students' reading comprehension, which can be attributed to Moodle supplementation?

2. Are there any statistically significant differences between the experimental and control group students' grammar use, which can be attributed to Moodle supplementation?

The review of the literature has shown that much research examines teachers' use of technology across basic and tertiary education (e.g. Abbad, Morris & De Nahlik, 2009; Al-Ghazo, 2008; Al-Jarf, 2005; Al-Shboul & Alsmadi, 2010; El-Seoud *et al.*, 2007; Mashhour & Saleh, 2010; Muflih & Jawarneh, 2011). However, to the best of these researchers' knowledge, no research has been conducted on the effect of Moodle supplementation on EFL learners' reading comprehension and grammar performance at Jordanian universities. Thus, even though the study is exploratory in nature and, hence, generalizability is not sought, its findings are hoped to contribute to the research on the role of Moodle supplementation in EFL learning in tertiary education in Jordan.

2.2. Sampling, methods and procedure

Two sections of English 111, a general university requirement at JUST in the first semester of the academic year 2016/2017, were selected purposefully to ensure that both are taught by the same instructor. With a flip of a coin, one section was randomly assigned to the experimental group and the other to the control group. The experimental group consisted of 17 students from various fields of study, and the control group consisted of a similar sample of 15 students. *New Cutting Edge (Intermediate)* was the textbook taught in this course. The control group received only in-class instruction whereas the experimental group received in-class instruction and Moodle supplementation.

Based on the review of the literature, the researchers designed a reading pre-/ post-test and a grammar pre-/post-test to gauge potential effects of the two levels of the treatment, in-class instruction on one hand and in-class instruction and Moodle supplementation on the other. The validity of the instruments was established by an expert jury of EFL university professors whose recommendations were considered in amending the final versions of the tests.

The reliability of the test was also established by administering them to a sample of 10 students which was excluded from the main sample of the study. The reliability coefficient amounted to 0.84 for the reading pre-/post-test and 0.82 for the grammar pre-/post-test. The pre-tests were administered to the sample before the treatment began and the post-tests immediately after the conclusion of the treatment.

2.3. The treatment: Instructing the experimental and control groups

Both the control and experimental groups were taught by the original course instructor to ensure that they received the same in-class instruction. She covered the prescribed six modules for the semester per the guidelines of the Teacher's Book. However, for the purposes of the study, the second researcher supplemented only four of the six modules for the experimental group who had unlimited access to Moodle inside and outside the classroom.

Each of the four modules was allocated two weeks (approximately 6 hours). Over these six hours, the instructor first taught the reading text and helped students answer questions (e.g., about new vocabulary, main topic, general and specific details) in both *the Student's Book* and *the Activity Book*. Each reading text and its exercises were taught over two one-hour sessions. The instructor usually read or asked the questions, and the students answered them.

The remaining four sessions were allocated to grammar. The instructor explained the grammar topic per the guidelines in *the Activity Book*, supporting the rule with examples before coaching the students to do the exercises in the textbook.

At the onset of the treatment, the second researcher organized a Moodle tutorial for the participants of the experimental group. They were also reminded of the link to the step-by-step user manual on the Student Services section of the university website (https://elearning.just.edu.jo/course/view.php?id=15).

The participants were instructed to view the material posted on Moodle at the beginning of each week over the course of the treatment. Both the instructor and second researcher explained that this material is supplementary to the in-class reading comprehension

and grammar instruction. The second researcher was always on hand for both academic and technical support. She accessed Moodle at least twice a day to answer questions, reply to grammar forums, check students' logs and Moodle-related activity, thank active students, and urge less active students to participate.

Specific grammar points, based on the table of contents of the textbook (viz., *Past Simple tense, Past Continuous tense, Present Simple tense, Present Continuous tense, Future Simple tense,* and *comparative and superlative adjectives*) formed the content of the treatment. The reading comprehension skills of *scanning, skimming, building powerful vocabulary,* and *looking for the topic* were also targeted.

The instructional content was posted on Moodle to supplement face-to-face classroom instruction for the experimental group only. PowerPoint slides and multiple-choice self-assessment tests, on both reading and grammar, were posted weekly. In addition, a grammar activity on the topic of the week was posted on the Forums component of Moodle for the students to communicate with the second researcher and their fellow students.

2.4. Findings of the study

The findings of this research are presented per its research questions. To answer the first question, which sought potential statistically significant differences (at $\alpha=0.05$) between the experimental and control group students' reading comprehension which can be attributed to Moodle supplementation, a timed reading comprehension pre/post-test was administered. The students' mean scores and standard deviations on the pre-/post- tests were calculated, along with the adjusted mean scores and the standard errors on the post-test based on the differences between the two treatments, in-class instruction and in-class instruction with Moodle supplementation, as shown in Table 1.

Table 1. Means, adjusted means and standard deviations of students' scores on the reading comprehension pre-test and post-test

| Group | Skill | PRE | | Post | | Adjusted | Standard |
		Mean	SD	Mean	SD	Mean	Error
Control	Scanning	4.26	1.03	4.53	0.91	4.39	0.22
	Looking for the main topic	2.86	1.30	3.33	1.29	3.31	0.34
	Building powerful vocabulary	2.80	1.42	3.66	1.34	3.94	0.36
Experimental	Skimming	3.70	1.04	3.09	0.34	3.80	0.26
	Reading (Overall) main topic	13.53	3.69	14.20	3.40	14.35	0.82

Building powerful vocabulary	3.82	1.55	5.11	1.53	4.87	0.33
Skimming	2.94	1.34	4.05	1.47	3.94	0.33
Reading (Overall)	13.82	4.23	16.62	4.31	18.54	0.81

Table 1 shows observed differences between the mean scores of the two groups on all four skills. The mean scores of *scanning, looking for the main topic, building powerful vocabulary, skimming,* and *overall reading comprehension* on the reading comprehension pre-test amounted to 4.26, 2.86, 2.80, 2.60, and 12.53 for the control group and 3.70, 3.25, 3.82, 2.94, and 13.82 for the experimental group, respectively.

Table 1 further reveals observed differences in the adjusted mean scores on the post-test of the experimental and control group in the four reading skills and overall reading comprehension, in favor of the experimental group. To determine whether these differences are statistically significant (at α=0.05), MANCOVA was used, as shown in Table 2.

Table 2. MANCOVA of students' scores on the reading comprehension post-test

Skill	Source	Sum of Squares	df	Mean Squares	F	Sig.	Partial Eta Squared
Scanning	Way	6.074	1	6.074	9.716	*0.004	0.272
	Error	16.253	26	0.625			
	Corrected Total	25.875	31				
Looking for the main topic	Way	5.841	1	5.841	3.852	0.060	0.129
	Error	39.425	26	1.516			
	Corrected Total	62.219	31	62.219			
Building powerful vocabulary	Way	5.150	1	5.150	3.162	0.087	0.108
	Error	42.347	26	1.629			
	Corrected Total	79.875	31				
Skimming	Way	7.623	1	7.623	4.679	*0.040	0.153
	Error	42.360	26	1.629			
	Corrected Total	75.719	31				
Reading (Overall)	Way	98.237	1	98.237	10.253	*0.004	0.283
	Error	249.106	26	9.581			
	Corrected Total	577.500	31				

Table 2 shows statistically significant differences (at α=0.05) in the students' post-test scores in *scanning, skimming* and *overall reading comprehension*, in favor of the experimental group (F=9.716, 4.679, 10.253; df=31,1; P=0.004, 0.040, 0.004).

The second research question sought statistically significant differences (at α=0.05) between the mean scores of the grammar post-test between the experimental and control group students, which can be attributed to Moodle supplementation. The mean scores and standard deviations on the pre-/post-tests, along with adjusted mean scores and the standard deviations of the post-test scores based on the differences between the two treatments, were calculated as shown in Table 3.

Table 3: Means, standard deviations, adjusted means, and standard errors of students' scores on the grammar pre-/post-test

Group	Pre-		Post-		Adjusted Mean	Standard Error
	Mean	SD	Mean	SD		
Control	5.86	4.65	7.93	4.81	8.62	0.81
Experimental	7.23	4.64	11.52	5.83	10.92	0.76

Table 3 reveals a difference in the adjusted mean scores of the experimental and control groups, with a difference of 2.30, in favor of the experimental group. ANCOVA was used to analyze students' scores to determine whether the variance between the adjusted means on the grammar post-test is statistically significant (at α = 0.05), as shown in Table 4.

Table 4: ANCOVA of students' scores on the grammar post-test

Source	Sum of Squares	df	Mean Squares	F	Sig.	Partial Eta Squared
Way	41.10	1	41.10	4.18	0.05*	0.12
Error	284.78	29	9.82			
Corrected Total	972.21	31				

Table 4 shows a statistically significant difference in students' mean scores on the grammar post-test (F= 4.18; df= 31; P= 0.05), in favor of the experimental group.

3. Discussion, implications, and recommendations

The first research question addressed the effect of Moodle on the students' reading comprehension. The results revealed a statistically significant difference in scanning, skimming, and overall reading comprehension in favor of the experimental group. This improvement in reading comprehension may be readily attributed to the slides and self-

assessment in which the students engaged throughout the treatment. The researchers have been keen on sending students who did the tests private thank-you notes to encourage them to continue accessing Moodle.

On the slides, students read about the skill itself and used the knowledge they gained to answer questions on the reading texts. They also had access to an answer key to the exercises on the slides and to extra practice through hyperlinks to exercises on the web. They could also do as many self-assessment tests as they wanted after at least half an hour to allow them the opportunity to reread the slides and check the required information.

The scores of all attempts were recorded, and students could review their answers before submitting the test. Similarly, both correct and incorrect answers could be viewed immediately after submission. The immediate feedback and self-pacing capabilities of Moodle not only reduced learning time but also contributed to increased confidence, better attitudes, and a sense of accomplishment towards learning (Koedinger *et al.*, 1997), hence, improved reading comprehension.

Most students viewed the slides more than once. These recurrent views suggest that the slides not only provided students with the opportunity to control their own learning and decide what, when and where to study but also engaged them in their own learning. Out of the four targeted skills, *scanning*, with 62 views for the slides and 81 for the self-assessment, received the highest students' interest, followed by *skimming* with 34 views for the slides and 52 for the self-assessment.

These results are consistent with those reported by Levine *et al.* (2000), Dreyer and Nel (2003), Tsai and Talley (2014), Sun (2014), Yang *et al.* (2014), and Banditvilai (2016), which all report a positive effect for Moodle and online learning on reading comprehension.

The second research question addressed the potential effect of Moodle on the students' grammar performance. The results revealed a statistically significant difference in the students' grammar scores in favor of the experimental group. One possible explanation for these students' superior performance is their active engagement as they studied slides, did self-assessment, and posted in forums.

PowerPoint slides were regularly posted on Moodle to supplement the grammar material covered in class. These slides covered the basic structure and use in addition to providing hyperlinks to extra information, activities and quizzes, and YouTube videos on each grammar point. The students were keen on viewing these slides. For example, the *Present Simple* and *Present Continuous* folder was viewed 107 times, the *Past Simple* and

Past Continuous 60 times, *comparative and superlative adjectives* 53 times, and *future forms* 18 times.

The slides also contained self-assessment, complete with answer keys. One test was posted on each of the topics covered in class. Students did these tests and got feedback immediately after submission of responses. The students were also allowed unlimited attempts, which enabled them to get even more grammar practice. More specifically, the *Present Simple* and *Present Continuous* tests received 144 views and 34 attempts, *Past Simple* and *Past Continuous* 56 views and 20 attempts, *comparative and superlative adjectives* 55 views and 19 attempts, and *future forms* 49 views and 17 attempts.

The researchers also posted on each grammar topic covered in the class in the grammar forums. Most students engaged actively in the forums. What was especially beneficial was the students' ability to view any discussion and their peers' replies, which encouraged them not only to post replies but also to learn from their peers' errors which were corrected by the research team. For example, *Forum 1, Practising the Present Simple,* received 113 views and *Forum 2, Practising the Present Continuous,* 66 views.

The results of this study were in line with the general conclusions drawn from other studies (e.g., Hsieh & Ji, 2013; Nagata, 1996; Plomteux, 2013; Şahin-Kızıl, 2014), which asserted the effectiveness of Moodle in learning grammar. These researchers claim that research such as the one at hand is instrumental for increasing instructors' awareness of the utility of Moodle, and other LMSs, in EFL teaching and learning. Even though no generalizations are sought from the research, it seems to suggest that Moodle supplementation of face-to-face instruction is a catalyst for language learning.

The researchers have experienced first-hand the original instructor's enthusiasm for Moodle supplementation. She candidly expressed her interest in Moodle-enhanced instruction which, albeit expected by the University, is hard to implement given the relatively heavy teaching loads, large classes, and lack of logistic support. She has corroborated research findings (e.g., Gichoya, 2005) that merely having the technological infrastructure is inadequate for technology to fulfill its promise to higher education if the human resource infrastructure is not addressed.

Thus, it is the recommendation of this study that training of faculty and students alike be considered a priority at institutions with reasonably advanced technological infrastructure. Otherwise, technology remains more a luxury than a catalyst and a requirement for better academic performance.

It is also the recommendation of this research that similar investigations be conducted with a larger scope, in both sampling and duration, on reading comprehension, grammar, and other language aspects to corroborate the current findings and increase their potential generalizability.

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