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The effects of using blogs and webquests in teaching pre-service teachers

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Abstract

In this study, the effects of two blended learning strategies on the academic achievement of pre-service teachers were examined in two Education courses. The control group composed of 25 teaching diploma students who received face-to-face learning instructions in two courses: teaching methods and essentials of education. The experimental group consisted of 22 students who received blended learning instructions in the same courses. Four achievement tests were administered to measure the students' achievement. The difference between the results of both groups was analyzed using the analysis of variance statistical method. The students' achievement in questions requiring high levels of thinking was examined and compared to both groups. Positive results for using blended learning strategies were observed in the course of Teaching Methods but were not clearly observed in the course of Essentials of Education. The difference between the results of both groups was statistically significant in the course of Teaching Methods.

Keywords: WebQuests, blogs, critical thinking.

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1. Introduction

The Teaching Diploma program at the American University of Science and Technology in Lebanon provides teachers with the opportunity to further their professional careers through seven required education courses. These courses serve in improving the teaching pedagogies of expert teachers and engaging pre-service teachers in teaching practices. One required course in the program is the "Essentials of Education". It's a basic course that includes the study of the modern principles of education and their applications at all levels and considers the climate in which teachers work today and its impact on teaching. The main objective of this course is allowing the students to explore historical, political, economic, legal, social, philosophical and curricular foundations from the perspective of their being and relate it to current educational practices and trends. Using traditional methods in teaching this course leads to rote learning of the material and lack of students' ability to use this material in analyzing the recent educational practices. Another two required courses in the program are "Teaching Methods I and II". In these courses, teachers are expected to be familiarized with the dominant trends and research perspectives about learning and teaching disciplines and how to help their students understand critical and advanced concepts. Student-teachers are expected to integrate creative approaches, collaborative strategies and projects, and problems-based methods into activities. Students in these courses are expected to get engaged in the best practices of teaching and effectively present concepts through multimedia technologies. Students have lacked the motivation to get engaged in the learning activities of this course. Blended learning strategies have been planned to serve the needs of these students and motivate them to learn. Blended learning has been defined as the combination of traditional face to face learning and distance learning using different learning theories in the same place and supporting them with different online technologies (Rossett, 2002; Singh, 2003; Graham, 2006; Stacey & Gerbic, 2009). Blended learning allows having active and collaborative learning environments by providing asynchronous computer-mediated instructions (Sethy, 2008). Many international research studies have showed that implementing blended learning strategies reinforces the students' active participation in the subject activities and has positive effects on the learning and process, and students' academic achievement (Lovel, 2009; Gecer & Dag, 2012; Yapici & Akbayin, 2012; Kazua & Demirkolb, 2014). Two blended learning strategies were used to solve the problems of students registered in the courses: "Essentials of Education" and "Teaching Methods I". These two strategies were: Blogs and WebQuests.

WebQuests are strategies which belong to station rotation model of blended learning. This applies in that WebQuests belong to a learning environment where students follow a schedule of online and face-to-face activities (Sarria & Molina, 2012). WebQuests are strategies that belong to an inquiry-based approach to learning which has gained a lot of significance from educators of different cycles of learning, where learners interact with the help of online resources (Dutt-Doner, Wilmer, Stevens & Hartmann, 2000; Dodge, 1995; Joseph, 2000; Pohan & Mathison, 1998). It helps the learner to organize the information researched online and to use it in discussions and answering questions (Patterson & Pipkin, 2001). This designed activity includes the following parts: (a) Introduction, (b) Task, (c) Process, (d) Evaluation, and (e) Conclusion (Dodge, 1995). WebQuests are considered a blended learning strategy since WebQuests are designed to be completed by the learners and then to be discussed in the classroom (Dodge, 1995). Studying the effectiveness of using WebQuests in learning, it has been argued that they are considered the solution for all problems in the learning process (Vidoni & Maddux, 2002).

Similar to WebQuests, blogs belong to the station rotation model of blended learning. Blogs are regularly updated websites that are administered by a user or a group of users (Stefanac, 2006). Blogs are used to let students gather and post information related to a specific topic assigned by the instructor (Sim & Hew, 2010). Blogs have been easily used by learners due to their simplicity and ability to enhance interactivity between learners (Williams & Jacobs, 2004). After the instructor forms the blog and posts the task, learners can write entries, reflect on their peers' answers, review, and interact (Williams & Jacobs, 2004; Pinkman, 2005). Blogs are organized chronologically and readers are allowed to comment on online posts (Lawrence & Dion, 2010). For this reason, blogs are efficient tools

for assignments that require students to write essays in response to other blogs and online media (Lawrence & Dion, 2010).

2. Method

The study was conducted in fall 2016 on students registered in the two courses: "Teaching Methods I" and "Essentials of Education". The study examined the effect of using two blended learning strategies in achieving the learning outcomes of these two Education courses on the students' academic achievement. It was a quantitative comparative research study since the results of a group of students receiving blended learning instructions were compared to those of students not receiving blended learning instructions in the same courses. The two blended learning strategies used were blogs and WebQuests.

2.1. Participants

The study group of research was composed of 47 pre-service teachers who studied at the American University of Science and Technology, Teaching Diploma program. 25 participants were receiving face to face learning instructions (Group A), and 22 participants were receiving blended learning instructions (Group B). The achievement of both groups was measured and compared.

2.2. Data collection tools

The instruments used to collect data were four achievement tests (T1, T2, T3, and T4). Four achievement tests were designed to assess the students' ability to apply, analyze, elaborate, and design teaching methods according to their subject of emphasis. Each of T1, T2, and T3 were administered on week four, eight, and twelve of the semester respectively. T4 was the comprehensive summative exam of the course which was administered at the end of the course (week 15 of the course).

These tests contained two main parts; an objective part and an extended response questions part. The test items of the objective part were multiple choice questions since they were considered to be versatile, reliable and valid. The extended response questions part included short answer test items. Multiple answers for these questions were included in the answer key and every answer was graded to ensure the reliability of the results. All test items were designed to test three different cognitive levels of thinking (C1, C2, and C3). The first cognitive level (C1) test items reflected the basic level of order thinking: the ability to remember and understand. The second cognitive level (C2) test items examined the students' ability to apply and analyze. The third cognitive level (C3) test items assessed the students' ability to evaluate and synthesize. These exams were designed by the two instructors who taught these courses.

3. Results

The mean of the achievement tests was calculated for each group. The achievement test results of groups A and B were analyzed and compared using the analysis of variance statistical method. The mean values of the four achievement tests administered in the course Essentials of Education are shown in Table 1, where the p-value stands for the analysis of variance of each test.

Table 1. Results of students' academic achievement in tests in essentials of education

Groups	Group A	Group B	P-Value
T1	54.5	75.4	0.0225
T2	78	75.5	0.6520
T3	86.1	67.2	0.0007
T4	73.7	82.2	0.0258

According to the results shown in Table 1, group B achieved higher than group A in T1 and T4, whereas group A achieved higher than group B in T2 and T3. The difference between the results of T3 of both groups was statistically significant, where the control group achieved higher than the experimental group.

Table 2. The results of C1, C2, and C3 in the achievement test (T1) of both groups in essentials of education

Level of Thinking	Group A	Group B	P-Value
C1	60	72	0.1601
C2	55	85	0.0045
C3	43	48	0.6494

Table 2 shows the mean values of the achievement of each group in questions of different levels of thinking in the first achievement test (T1) in the course Essentials of Education. Group A scored lower than group B in answering questions requiring the three different levels of thinking (C1, C2, and C3). However, the difference between the scores of C2 of both groups was the only one to be statistically significant (p-value < 0.05).

Table 3. The results of C1, C2, and C3 in the achievement test (T2) of both groups in essentials of education

Level of Thinking	Group A	Group B	P-Value
C1	71	60	0.308
C2	77	84	0.16472
C3	79	89	0.081

Table 3 shows the mean values of the achievement of each group in questions of different levels of thinking in the second achievement test (T2) of the course Essentials of Education. Group A scored higher than group B in answering questions requiring the three different levels of thinking. However, the difference between the scores of both groups was not statistically significant (p-value > 0.05).

Table 4. The results of C1, C2, and C3 in the achievement test (T3) of both groups in essentials of education

Level of Thinking	Group A	Group B	P-Value
C1	77	79	0.8377
C2	94	65	0.000778
C3	80	90	0.088422385

Table 4 shows the mean values of the achievement of each group in questions of different levels of thinking in the third achievement test (T3) of the course Essentials of Education. Group A scored lower than group B in answering questions of the first and third levels of thinking. However, the difference between the scores of both groups in C1 was not statistically significant and in C3 was slightly significant. The difference between the scores of both groups in C2 was statistically significant, where the control group achieved higher than the experimental group.

Table 5. The results of C1, C2, and C3 in the achievement test (T4) of both groups in essentials of education

Level of Thinking	Group A	Group B	P-Value
C1	65	73	0.176691723
C2	86	87	0.799931985
C3	78	81	0.704342013

Table 5 shows the mean values of the achievement of each group in questions of different levels of thinking in the fourth achievement test (T4) of the course Essentials of Education. This test is a summative achievement test. Group A scored lower than group B in answering questions requiring the three different levels of thinking (C1, C2, and C3). However, the differences between the scores of C1, C2, and C3 of both groups were not statistically significant (p-value > 0.05).

Table 6 shows the mean values of the results of the four achievement tests administered in the course Teaching Methods I. The difference between the values of each group was analyzed using ANOVA and is shown in the table below.

Table 6. Results of students' academic achievement in tests in Teaching Methods I

Groups	Group A	Group B	P-Value
T1	75.71	77.1	0.7592
T2	61.5	81.86	0.0004
T3	58.29	82.45	0.0004
T4	72.71	81.79	0.0309

According to the results shown in Table 6, group B achieved higher than group A in T1, T2, T3, and T4. The differences between the scores of T2, T3, and T4 were statistically significant (p-value < 0.05).

Table 7. The results of C1, C2, and C3 in the achievement test (T1) of both groups in Teaching Methods I

Level of Thinking	Group A	Group B	P-Value
C1	50	77	0.000362074
C2	83	76	0.266867858
C3	82	54	0.0000031578

Table 7 shows the mean values of the achievement of each group in questions of different levels of thinking in the first achievement test (T1) of the course Teaching Methods I. Group A scored lower than group B in solving C1 test items, and the difference between the results was statistically significant (p-value <<0.05). The control group scored higher than the experimental group in answering questions requiring the second and third levels of thinking (C2, and C3). The difference between C3 scores is statistically significant.

Table 8. The results of C1, C2, and C3 in the achievement test (T2) of both groups in Teaching Methods I

Level of Thinking	Group A	Group B	P-Value
C1	50	86	0.00005484
C2	61	68	0.251970957
C3	64	83	0.02040596

Table 8 shows the mean values of the achievement of each group in questions of different levels of thinking in the second achievement test (T2) in the course Teaching Methods I. Group B scored higher than group A in answering questions requiring the three different levels of thinking (C1, C2, and C3). The differences between the scores of C1 and C3 of the control group and the experimental group were statistically significant.

Table 9. The results of C1, C2, and C3 in the achievement test (T3) of both groups in Teaching Methods I

Level of Thinking	Group A	Group B	P-Value
C1	75	91	0.023912537
C2	48	82	0.002239802
C3	66	83	0.003383687

Table 9 shows the mean values of the achievement of each group in questions of different levels of thinking in the third achievement test (T3) in the course Teaching Methods I. Group A scored lower than group B in answering questions requiring the three different levels of thinking (C1, C2, and C3). The difference between the scores of C1, C2, and C3 of both groups was statistically significant (p-value < 0.05).

Table 10. The Results of C1, C2, and C3 in the achievement test (T4) of both groups in Teaching Methods I

Level of Thinking	Group A	Group B	P-Value
C1	69	79	0.079839775
C2	68	80	0.007215206
C3	80	95	0.014137776

Table 10 shows the mean values of the achievement of each group in questions of different levels of thinking in the fourth achievement test (T4) in the course Teaching Methods I. The experimental group scored higher than the control group in answering questions requiring all different levels of thinking. The difference between the scores of the three levels of thinking is statistically significant.

4. Discussion and Conclusion

This study aimed at examining the effect of using two strategies of Blended Learning instructions to teach the course of Essentials of Education and Teaching Methods I on the students' academic achievement in solving questions of different levels of thinking. According to the results shown above, students achieved higher in the course of Essentials of Education when they received regular face to face learning instructions. This is shown in the total scores of the achievement tests of this course. The mean values of C1, C2, and C3 scores for the summative exam (T4) at the end of the course were higher for the experimental group, but the difference between the results was not statistically significant. This showed that blended learning instructions did not give similar positive results in the course of Essentials of Education as shown in different studies about the effectiveness of blended learning.

According to the results of Teaching Methods I course, there was no significant difference between the achievements of both groups achieved in the first achievement test. However, the difference in the scores started to appear in T2, T3, and T4, where the experimental group achieved higher results than the control group. Students receiving blended learning instructions in the course Teaching

Methods I achieved higher than students receiving face to face learning instructions in solving questions requiring high levels of thinking.

According to this study, an alignment with literature was shown when blended learning instructions was used in teaching the course of Teaching Methods I, but similar positive results were not observed in the course "Essentials of Education". Some reasons might be because of the nature of the "Essentials of Education", which is a course that aims at teaching the students about the educational theories, ancient philosophies, and all of the pioneers of education. Other reasons might be related to the teachers' perceptions towards a new method of teaching in such a course. The teachers' perceptions about blended learning strategies affect the students' attitudes towards engaging in the learning process, thus affecting their achievement (Blose & Fisher, 2003; Sahin, 2003). According to Dodge (2001), negative results of using WebQuests in teaching might be because many teachers are not applying it as it was defined, since some educators tend to just post worksheets on online pages, and are not using WebQuests as a tool of instruction.

The objectives of "Teaching Methods I" aimed at introducing different methods of teaching to teachers and allowing the teachers to try applying these methods in their lessons. The practical objectives of this course helped in allowing the students to use blended learning strategies to share their experiences online and at any time. Moreover, it was shown that students expressed freely their ideas online more than they did in class and had the opportunity to read all of the others' comments due to the emotional safe environment provided by blogs (Ammarell, 2000; Valentine, 2001). According to Kroeber (2005), students prefer to learn in a learning environment where technology is used. This explains the results shown by studies about students' positive attitudes towards using blogs (Pearson, 2010). Positive students' attitudes lead to students' engagement in the task, which made it easier for instructors to follow up on the students' homework and progress (Pearson, 2010). Students' engagement and participation lead to increase in the students' learning especially when the time of writing their own ideas increases (Pearson, 2010). Moreover, using blogs in teaching pre-service teachers served in allowing them to share their experiences and reflect on them (Good & Whang, 2002). Commenting on their teaching experiences and participating in sharing solutions of each other's teaching problems served in forming an ongoing cooperative support in their professional life. WebQuests consist of questions of a specific cognitive level, and this is what should be designed by all who integrate using WebQuests in their lessons (Dodge, 2001). This allowed the students to develop high cognitive levels of thinking and achieve higher in questions requiring higher levels of thinking. Many studies which investigated the effectiveness of WebQuests in learning showed that it enhances students' learning and motivates them to achieve the assigned learning outcomes (Hassanien, 2006; Gulbahar, Madran & Kalelioglu, 2010). Blended learning instructions include many teaching strategies which make it always a subject which is open to research. Further research is recommended to examine the effectiveness of blended learning instructions on the students' attitudes and achievement in different courses of education. Qualified instructors' training to integrate blended learning in lessons is also recommended since the lack of proper designing of WebQuest activities was the reason for negative results in some studies (Abbit & Ophus, 2008).

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