The Effect of Teaching Mathematics Supported by E-learning Platforms on the Students' Mathematical Skills in a College Course in Jordan

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Abstract—Exploring the impact of e-learning on a student's math skills was the main objective of this study. The experimental design was applied in this study to 80 students from the calculus course from the first semester in the 2021-2022 academic year at The Hashemite University, where they were divided into two groups, a control group and a experimental group. Three modules of calculus textbook (function, ends, graph curves) were adopted, the traditional whiteboard was used in the teaching of the control group, while e-learning platforms were used to teach the experimental group. A tribal test dish to measure sports skills and a distance test on students. Use SPSS to assess the effects. The experimental group showed superiority over the control group by analyzing the results from the tests applied. Teaching on e-learning platforms (Modal, E-Learning, zoom) has shown effective consequences for the student's sports skills. These results correspond to a set of previous studies that will be presented in this research.

Keywords—teaching mathematic, e-learning platforms, mathematical skills, college students

1 Introduction

The circumstances associated with the Corona pandemic required universities in Jordan to apply distance learning through e-learning (Modal platforms, e-learning and zoom), and universities, through their teachers, focused on acquiring knowledge that focuses on how to integrate technology into teaching different subjects to students at home without having to attend university. E-learning (conditional platforms, e-learning, zooming in), and online meetings can be useful for remote learning despite the separation of the learner and teacher because of pandemic conditions where they cannot meet in the traditional school room.

The results showed that gaining knowledge in online classrooms and interactive conversation using online educational methods allows for strong relationships between students and teachers, which will sooner or later increase students' participation in online education.[9].

That the use of scientific sources in e-teaching is vital for teachers and the results of the study showed that teachers who used a different set of tools, such as Microsoft Teams, Canvas, Blackboard and Moodle, in e-learning have achieved good results with their students in effective learning [6], [19].

A survey on how to provide information and student participation (interactive discussions and tasks in online learning) showed a survey of 417 university students, where the survey showed online learning as fun for students and combined previous learning with joining advanced community issues. [1].

A study was conducted in India on the thinking framework and challenges faced by schoolteachers in online education during COVID-19, and through a descriptive survey of 3,550 faculty members showed the result of teachers with a positive attitude towards e-learning. But they are inexperienced and lack the effectiveness of distance teaching so that they can appear higher in the traditional classroom studies [9], [6].

A study on American teachers' perceptions of the transition from classroom to online teaching has shown a range of challenges they have faced such as vice removal issues, online exam, stimulating activities, student absence, reading problems, and evaluation problems studies [10], [24].

The impact of e-learning platforms (Modal, E-Learning and Zoom Platforms) on skills during the Corona case was identified and the use of e-learning and Moodle was found to be effective in mentoring and learning studies [15], [23].

Simplifying the use of e-learning and considering all the cognitive, social and psychological bases contribute to increasing and improving the positive attitudes towards e-learning among students and contributes to the development of long-term knowledge of the students themselves. studies [21], [22].

E-learning (Moodle, e-learning and Zoom platforms) is among the many scientific solutions that are used by teachers to teach remotely and gain knowledge, and this study was conducted to reveal the effectiveness of e-learning (Moodle, e-learning and Zoom platforms) in teaching mathematics and its impact on skills Sports for students in Jordan.

2   Methods

Use of experimental design and preliminary testing/post-testing applied to groups (experimental group and controlled group).

Students of the calculus course were selected from the first semester of the academic year 2021-2022 at the Hashemite University, and they were divided into two groups, each group consisting of forty students. Experimental group A studied using e-learning (Moodle, e-learning, zoom platforms), control group B studied using whiteboard, groups A and B mainly depend on their ratings in the initial test through random assignment, Mathematics education supported by e-learning tools (Moodle, e-learning and Zoom platforms) was considered an independent variable, while the dependent variable is the students' mathematical skills.

A test was made based on the three units (function, limits, curves) selected from the Calculus book, and it consisted of (100) questions. Those were divided into three sections. Sections (a) and (b) consist of 35 questions each while area (c) of 30 questions only appears in items Table 1.

The researcher developed fifty (50) questions of each part, Section A, B and C. solely hundred (100) questions out of one hundred and fifty (150) questions selected, 35 for part A and B each and 30 for area C.

Table 1. Distribution the Test

S.NO	Test Designing	No. items of test
1	Fill in the blanks	35
2	Multiple Choice	35
3	True or false	30
	Total	100

Table 1, distribution of marks test, fill in the Blanks 35 Multiple Choice 35 True or False 30 Total 100 Data was collected once by a faculty member.

The following activities were carried out:

1. Solving Associations, the teacher solves the equation for the students on e-learning and asks them to solve another equation.
2. Drawing Curves, the teacher provided a variety of examples of drawing curves (via math drawing apps).
3. imits. The teacher asked the students with many examples of limits.

The three activities lasted for 27 hours and were distributed over a period of (9 weeks) for a period of months. The control group was given the study using the whiteboard, and the experimental group study by e-learning (Moodle, E-Learning and Zoom Plat-Forms).

3 Findings

After the pre- and post-test was performed, data and results were collected once and tabulated, analyzed, and interpreted. Using the computer program MS-Excel and SPSS, the evaluation of the t-test was analyzed by the average frequency of the classification.

Table 2, it shows that the results for the experimental group are (SE = 1.82) and the control (SE = 1.79) groups with a value of t = 0.177 and p = 0.86. Although the achievement was slightly greater in terms of implicit for the experimental group, there was a higher variance and the measured effect was 0.098 computed due to the difference in mathematical skills between the experimental and control groups, i.e. there is no significant statistical difference (eg $p > 0.05$).

Table 2. Mathematical skills before treatment (Pre-test)

Group	N	M	SD	SE Mean	t	P	Effect size
Experimental	40	41.50	11.49	1.82			
					0.177*	0.86	0.098
Control	40	41.10	11.30	1.79			

*Significant

Table 3, It shows that the students of the experimental group got (SE = 1.41) and the control group (SE = 2.09) with a value of t = 5.984 and p = 0.000. The difference in favor of the experimental was statistically significant (eg $p < 0.05$). The measure of the effect of 0.56 on the achievement of the experimental group was good.

Table 3. Mathematical skills after treatment (Post-test)

Group	N	M	SD	SE Mean	t	P	Effect size
Experimental	40	74.7	8.96	1.41			
					5.984*	0.00	0.56
Control	40	59.57	13.24	2.09			

*Significant

Table 4 shows the students' significant points from the test (pre-test) (SE = 1.82) and the experimental (post-test) (SE = 1.79) with a value of t = 14.43 and p = 0.000. The difference between the mathematical abilities of the experimental group is considered to be statistically significant (eg $p < 0.05$). The effect size of 3.29 represents the effect of e-learning on the mathematical skills of the experimental group, significantly positively.

Table 4. Difference of experimental groups before and after treatment

Group	N	M	SD	SE Mean	t	P	Effect size
Experimental (pre-test)	40	41.50	11.49	1.82			
					14.43*	0.00	3.29
Experimental(post-test)	40	74.70	8.96	1.79			

*Significant

Table 5 shows that the control (pre- test) (SE = 1.79) and the control (post-test) (SE = 2.09) have a value of t = 6.713* and p = 0.000. The effect dimension of 1.50 reflects the use of e-learning, which is the skill recorded by the control group compared to teaching on the white board.

Table 5. Difference of control groups before and after treatment

Group	N	M	SD	SE Mean	t	P	Effect size
Control (pre-test)	40	41.10	11.30	1.79			
					6.713*	0.00	1.50
Control (post-test)	40	59.57	13.24	2.09			

*Significant

The research participants were informed about the goals and objectives of the study and gave their written consent to participate in the experiment; they were also informed about their right to refuse participation at any stage of the experiment.

4 Result and discussion

Based on these findings, that as the entire the students taught via the e-learning (Moodle, E-learning and Zoom platforms), gives out-performed about the students taught through the traditional whiteboard use. Thus, the use of e-learning e-learning (Moodle, E-learning and Zoom platforms), in the educating of math can be advocated as likely to be more awesome for instructing mathematic.

The results of this research agree with the findings of Al-Amiri and Masada [1] in terms of the positive use of e-learning (Moodle, e-learning, and Zoom platforms), and the splendor of e-learning by enhancing students' mathematical skills. On the other hand, teachers who have devices have acquired science Very cool new app.

[11] It was found that the challenges that teachers face using e-learning (Moodle, e-learning, and Zoom platforms) are diverse, for example, Internet-related problems, device problems, online exam, directed motivational activities, student absence, and the possibility of assessment.

Moreover, the results of this research confirm the findings of the National Center for Education Statistics [8] to identify the integration of the Internet in lectures and its effect on stimulating student learning and normal general performance in Turkey, and mention some of the challenges faced by teachers in the context of e-learning, time, network degradation and low student participation.

The results are consistent with the study [10] that found that e-learning (Moodle, e-learning and zoom) had a positive impact on students' mental state and learning.

Study [22] the effectiveness of e-learning in organizing lectures. And improve lecture and enhance teaching and learning. Where education has been introduced into social networks, as a result, learning environments are transformed into a quality that is more closely related to the lived reality.

5 Conclusion

Corona will introduce new educational standards such as the full adoption of the use of e-learning (Moodle, e-learning, and zoom. platforms), and online applications. On the other hand, students value the impact of e-learning (Moodle, e-learning and zoom) in gaining knowledge in teaching and improving performance.

The adoption of e-learning (Moodle, e-learning, zoom platforms) leads to interaction between the teacher and students, enhances the organization of lectures and increases the effectiveness of teaching and learning. As for the challenges facing e-learning, they are represented by the lack of technological experience of teachers and students, and the lack of student participation, and from here there must be more awareness of the effectiveness of using e-learning (Moodle, e-learning, and Zoom platforms), to increase its adoption by universities. Teachers also need to be trained in the use of e-learning

(Moodle Forms, e-learning, Zoom plate). In addition, the government should make efforts to provide high-quality Internet to faculty and students and reduce the cost of e-learning to move forward.

On the other hand, colleges that focus on e-learning, should monitor e-learning (Moodle, e-learning, Zoom platforms). provided by teachers. They should set clear expectations about the regularity of teaching and ensure that teachers provide feedback to students.

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