

The Effect of Micro-Flipped Classroom in the Context of Distance Learning on TESOL Master Students' Achievement

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Abstract

Undoubtedly, online learning will continue to play an increasingly significant role in the years to come. So, the question is no longer whether instructors should use online learning environment or not, but rather how best to incorporate various educational strategies and practices into online classroom settings. As such, the purpose of the study is to determine the effect of using micro-flipped classroom in the context of distance learning on TESOL master students' achievement. The study was conducted on an experimental basis. It was applied to experiment (n=14) and control (n=15) groups. Data were collected through a pre-post test, and were then analyzed using Kolmogorov-Smirnova and Shapiro-Wilk tests. Effect size technique was used to measure the influence of micro-flipped classroom on the experimental group. At the end of the study, it has been found out that the micro-flipped classroom in the context of distance learning has positive effects on TESOL master students' achievement.

Keywords: flipped classroom, distance learning, academic achievement, TESOL, EFL

1. Introduction

The concept of education has undergone dramatic changes over the past few years, and many questions are raised as to what the ideal mode of instruction is with the advent of technology and the Internet (Boca, 2021). Although several teaching strategies and techniques have been utilized in the development of content for online courses, each type of teaching strategy may offer a unique benefit to a student. On the other hand, according to Kunene, Rugube and Maphosa (2022), there is a continuous need to relook and revisit learning and teaching approaches in higher education. Students should be able to participate meaningfully in a global and highly technical environment. As mentioned by Mthethwa-Kunene, Rugube, and Maphosa (2022), students in higher education institutions require more than content knowledge in the different disciplines, and technical skills should be complemented by soft skills, such as teamwork, communication, motivation, problem-solving, enthusiasm, and trust. It has been argued that the flipped learning strategy has the capacity to reflect the increasing advancements of the digital age and modern technologies, and consolidates digitization and the digital culture instead of going against or resisting it. It gives learners the opportunity to play a role in the implementation of activities with one other, interact, and communicate (Al-Jarrah, Ahmad, Ayasreh, and Mansour, 2021).

2. Theoretical Framework

Historically, flipped learning was developed in 2012 by high school chemistry teachers John Bergmann and Aeron Sams. They coined the term "Flipped Classroom" in 2002, and the term has been circulating ever since. They originally developed this approach for students who are absent from class (Birgili, Seggie, and Oğuz, 2021).

According to Ashley (2021: 121), some authors define flipped classroom as a set of pedagogical approaches with two components: computer-based extracurricular activities and interactive group activities in the classroom where instructors act as facilitators. Other authors define flipped classroom as a didactic innovation that allows students to individually work on new learning content at home using interactive materials such as teacher-generated videos. According to Shinas, Ly, and Ozden (2022), flipped learning is defined as a pedagogical approach that promotes a shift of direct instruction from a group learning space to an individual learning space; thus, a dynamic, interactive learning environment is created where students are supported by the educator in their application of the concepts and resourceful and creative participation in the subject matter. In short, through the above definitions, it is implied that flipped learning as an educational approach tends to transfer the focus of instruction to a learner-centred environment where class time is dedicated to the exploration of subjects in a more profound way and the creation of more collaborative opportunities for practice.

Currently, there is a rapid transformation and change in information and communication technologies. Due to the improvement of technology, teaching and learning are not just limited to the classroom. Lemoine, Waller, Garretson, and Richardson (2020) maintain that technology has the potential to create a tangible shift in the coming decades into the way educators teach and also the way students learn.

For the case in hand, the researcher integrated the concept of the 'Flipped Classroom' with the online environment to devise a new teaching model, the Micro-Flipped Classroom in the context of online learning. So, this research offers a unique combination of two

education strategies (i.e., online learning & flipped learning) and combines the advantages of e-learning, such as using several types of multimedia, hypermedia, the direct or indirect distance learning, and the advantages of flipped learning strategy.

Cheung, Li, Phusavat, Paoprasert, and Kwok (2020) indicate that this strategy offers many benefits to students, i.e. promote self-pace learning, provide opportunities for multiple exposures to course materials, assist with preparing students for class, open up more prospects for knowledge applications (e.g., activities, problem solving), give more opportunities for peer-assisted learning, and create a more favorable environment for timely intervention and support by the instructor. Furthermore, Martín, Acal, El-Homrani, and Estrada (2022) point out that flipped learning contributes effectively to the development of students' competencies through activity-based learning (i.e. learning by doing), and this ultimately enhances students' profound understanding of the subject matter, hence accomplishing meaningful learning. As a result, students's acquisition of higher order thinking skills is boosted, which, in turn, empowers them to reach a higher level of rational and reflective thinking capabilities, and makes them innovative, critical and creative.

Findings from several studies suggest that there are positive effects of flipped learning in the field of education (Polat & Karabatak, 2022; Nourinezhad, Hadipourfard & Baval, 2022; Jdaitawi, Hussein, Muhaidat, & Joudeh, 2022; Bergeson, 2022; Nja, Orim, Neji, Ukwetang, Uwe, & Ideba, 2021; Masadeh, 2021; Hava, 2021). By contrast, other studies have also emphasized the lack of any significant increase in learning performance (Arriaga & Talavera, 2018; Topal & Akhisar, 2018; Aggarwal, Thakur, Agrawal, Jhahharia, Madaan & Mahapatra, 2019; Leatherman & Cleveland, 2020).

In short, the fact that these studies have come up with various findings proves that there is a need for additional research in order to determine the actual effect of the flipped classroom approach in various disciplines and subjects. Besides, several scholars have called for more in-depth research on the effectiveness of flipped learning (Bergeson, 2022; Martín, Acal, El-Homrani & Estrada, 2022; Oudbier, Spaai, Timmermans & Boerboom, 2022). Therefore, there is a need for more thorough and profound research to investigate the educational pros and cons of implementing this approach with regard to postgraduate students so as to see whether favorable benefits will be obtained.

3. Method

3.1 Purpose and Research Questions

This study aimed basically to investigate students' achievement with the use of micro-flipped classrooms, in comparison to traditional instruction in the online environment. Additionally, the researcher investigated the magnitude of the impact of using micro-flipped classroom in the context of distance learning on TESOL master students' achievement. The research questions that guided this study were:

1. Is there any significant mean difference at the level of significance (0.05) between experimental (exposed to micro-flipped classroom in the context of distance learning) and control (exposed to traditional instruction in the context of distance learning) groups in achievement at the end of the experiment?
2. What is the magnitude of the effect of using micro-flipped classroom in the context of distance learning on TESOL master students' achievement?

3.2 Procedure

The data were collected in fall 2022. The sample included 29 students studying in TESOL program at Najran University. Given the context in Saudi Arabian universities, co-ed is not allowed. However, this seeming shortcoming can be turned into an advantage, as gender can be considered as a factor. The sample will be distributed into a control group of (15) students and an experimental group of (14) students. Courses were taught by the researcher herself.

For the purposes of this study, the "Curriculum Design & Development" course was redesigned and developed according to flipped learning in online context. Accordingly, pre-recorded videos are sent before the class time to students over the internet; besides simply lectures recorded by the instructor through a learning management system (LMS).

3.2.1 Instrument

This study utilizes the following instruments:

Achievement pre-test: An achievement test was designed, piloted, and administered to the participants. It aimed, first, to form an idea on students' knowledge level in both groups and, second, to ensure their comprehensive understanding of the concepts that the test included. This pre-test comprised 23 multiple-choice items that covered a sample duly representative of the content that the respondents were assumed to learn during the study.

Achievement post-test: At the end, the same achievement pre-test was conducted as a post-test so that the researcher could be able to compare the mean scores in both the groups.

3.3 Data Analysis

After the data collection phase, the Internal Consistency Reliability was calculated by Cronbach's Alpha Coefficient, which was (0.71), a value that is accepted for the purposes of this study. Table (1) shows the reliability coefficient for each item of the test:

Table 1. Reliability Statistics

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	18.1379	11.623	.402	.694
2	18.0690	11.852	.392	.696
3	18.1724	11.862	.291	.702
4	18.2069	12.027	.219	.709
5	18.1034	12.096	.254	.705
6	18.1379	12.337	.144	.714
7	18.2069	11.527	.385	.694
8	18.1724	11.933	.266	.705
9	18.2069	11.884	.265	.705
10	18.0690	12.209	.241	.707
11	18.0690	12.281	.211	.709
12	18.2069	11.599	.361	.696
13	18.1724	12.148	.193	.711
14	18.1724	12.005	.242	.707
15	18.1379	12.195	.194	.710
16	18.1034	11.810	.365	.697
17	18.1379	12.480	.094	.718
18	18.0345	12.249	.267	.705
19	18.1724	12.791	-.018	.727
20	18.1034	11.739	.394	.695
21	18.1724	11.362	.467	.687
22	18.1724	12.148	.193	.711
23	18.1034	11.739	.394	.695

The researcher examined the normality distributions of the data so as to determine the tests that should be conducted for the quantitative data analysis. In this regard, Kolmogorov-Smirnov coefficients and Shapiro-Wilk normality test were applied.

Kolmogorov-Smirnova and Shapiro-Wilk tests have been chosen considering their efficiency with regard to small sample groups. Eventually, non-parametric tests were conducted for the purpose of measuring the scores of the academic achievement pre-test between the control and experimental groups. As reflected in the data in Table 2, the scores of the academic achievement test of the experimental group and the control group have shown a statistically significant difference ($p = .000 < .05$).

Table 2. Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Analysis	.194	29	.007	.915	29	.023
Synthesis	.251	29	.000	.895	29	.007
Evaluation	.221	29	.001	.882	29	.004
Exam Total	.166	29	.040	.925	29	.042

a. Lilliefors Significance Correction

4. Results

4.1 Answer to the First Question

1. Is there any significant mean difference at the level of significance (0.05) between experimental (exposed to micro-flipped classroom in the context of distance learning) and control (exposed to traditional instruction in the context of distance learning) groups in achievement at the end of the experiment?

Mann-Whitney U-test, a nonparametric test used instead of independent samples t-test, particularly in cases where it is difficult to achieve normal distribution, was thus utilized here to compare the post-test results of the academic achievement test of both groups. The comparison of the academic achievement post-test conducted after the experimental procedure on the groups is shown in Table 3 below. The values obtained reflect that there is statistically significant difference in the achievement test scores of both the experimental and control groups after the experimental procedure ($p = .000 < .05$), favoring the experimental group.

Table 3. Comparison of Academic Achievement Post-test Application by Groups

Variables	Samples	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	Sig
Analysis	Control	15	9.28	286.50	12.500	-4.089	.000
	Experimental	14	22.04	148.50			
	total	29					
Synthesis	Control	15	10.09	161.50	25.500	-3.612	.000
	Experimental	14	21.04	273.50			
	total	29					
Evaluation	Control	15	9.75	156.00	20.000	-3.784	.000
	Experimental	14	21.46	279.00			
	total	29					
Exam Total	Control	15	8.81	141.00	5.000	-4.368	.000
	Experimental	14	22.62	294.00			
	total	29					

4.2 Answer to the Second Question

What is the magnitude of the effect of using micro-flipped classroom in the context of distance learning on TESOL master students' achievement?

To calculate the effect size, the researcher used Eta square " η^2 ". The interpretation of the effect sizes was based on the criteria set by Cohen (1992) for standardized mean differences. According to Cohen (1992), a value $\leq .02$ is a small effect size; a value closer to .15 is a moderate effect size; and a value $\geq .35$ is a large effect size.

Table 4. The Effect Size of Micro-Flipped Classroom on Academic Achievement

Variables	Z	$\sqrt{29}$	Effect size	Standard Eta
Analysis	-4.089	5.38516480	0.76	large
Synthesis	-3.612	5.38516480	0.76	large
Evaluation	-3.784	5.38516480	0.70	large
Exam Total	-4.368	5.38516480	0.81	large

5. Discussion

The results of this study reveal that learning via micro-flipped classrooms in the context of online learning is effective in the enhancement of postgraduate students' achievement. This was evidenced by the statistical analysis, which confirmed that micro-flipped learning had a positive and broadly significant effect on academic achievement. As a matter of fact, in the bulk of literature, many studies (Polat & Karabatak, 2022; Nourinezhad, Hadipourfard & Baval, 2022; Jdaitawi, Hussein, Muhaidat & Joudeh, 2022; Bergeson, 2022; Nja, Orim, Neji, Ukwetang, Uwe & Ideba, 2021; Masadeh, 2021; Hava, 2021) which highlight that flipped learning positively affects academic achievement. In this case, it can be presumed that the finding of the study goes in line with the relevant literature and that the abovementioned approach positively influences the learning achievement of the postgraduate students. By contrast, some studies that compared flipped learning to other methods have stated that there are no significant differences or no significant increase is observed in learning performance (Arriaga & Talavera, 2018; Topal & Akhisar, 2018; Aggarwal, Thakur, Agrawal, Jhajharia, Madaan & Mahapatra, 2019; Leatherman and Cleveland, 2020). The reason behind the different results obtained by these studies in the literature could be attributed to the different ways of implementation of flipped learning and the different flipped-learning-based activities carried out during the course. Moreover, it is also possible that this difference may have resulted from the different ways that the instructor followed in designing, managing and planning the process the implementation. Besides, different results may be brought about by difference in participants' adoption of flipped learning, their motivation and attitudes towards the course. Therefore, there is a need to apply much care during the planning process of courses designed for flipped learning.

It can be assumed that the reason for micro-flipped classrooms positively affecting learning performance arises because "in the traditional teacher-centred model, the instructor is the primary source of information. In contrast, flipped classrooms deliberately move education to a student-centred approach. Students are actively involved in the formation of knowledge as they are at the centre of the process and can make meaningful assessments on their own learning" (Keengwe & Tran, 2021). Flipped classroom in the context of online learning provides students who have had been exposed to the course materials more than once. Students are first exposed to the course materials before online class, i.e. during the pre-class activity. They are later involved with the course materials once more during the in-online class session. Multiple exposures to course materials can enhance students' achievement (Cheung, Li, Phusavat, Paoprasert, & Kwok, 2020). In addition, getting connected to distance education platforms contributes positively to students' learning achievement (Umar & Ko, 2022). In this regard, flipped learning presents similar advantages to computer-assisted learning, especially distance education. Besides, flipped learning supports different learning approaches, such as project-based learning, inquiry learning, game-based learning, mastery learning, makerspaces, and myriad other active learning strategies into class-time (Østerlie, 2020), which contribute positively to students' learning performance. In the study, employing the Eta square " η^2 " analysis to examine the effect size, the related results were investigated, and it has

been shown that the effect size was high, proving that the flipped learning is effective.

6. Conclusion

Undoubtedly, online learning will continue to have an increasingly significant role in the coming years. Therefore, the question is no longer whether or not instructors should utilize online learning environment, but rather how best the various educational strategies and practices are incorporated into online classroom settings.

An analysis of the overall results of the study indicated that micro-flipped learning in the context of online Learning generally represents an effective strategy in teaching postgraduate students. It reflects positively on the student's achievement. The importance of micro-flipped classrooms in the context of online learning comes from the students' role in this strategy: they play a significant role in learning. Finally, using micro-flipped learning in the context of online learning as a teaching strategy reflects on raising student's achievement. It develops students' skills, including communication skills, reception of information, and the interaction between the student and the instructor.

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