Effect Of Flipped Classroom Teaching On Students' Academic Achievement In Lexical Aspects Of English Language: Bloom Taxonomy In Flipped Classroom Teaching

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ABSTRACT

Flipped classroom teaching (FCT) is a new pedagogical technique that involves predetermined digital resources with students through a platform outside the classroom. The purpose of this experimental study is to examine effect of flipped classroom model on students' academic achievement in lexical aspects of English language. The true experimental pre/post-test equivalent group research design was used where two groups were formulated who were taught by volunteer teachers. The total participants comprised of 850 students from 12th grade, out of which 40 each students were selected for both FCG and NFCG for experiment at GHSS No. 1 Haripur by excluding flyer cases in pre-test. The 72-item MCQs were prepared through textbook of English having items with four possible distractors. Afterwards, validity was checked by panel of experts and Guttman Split-Half Coefficient determined by pilot testing (r = 0.837) reliability of instrument. The data collected from actual sample in both pre and post tests using the same tool. T-test along with Cohen's d for effect size was used for comparing the performances of students. The findings showed tremendous achievement of FCG after treatment. The higher order learning that involves application, evaluating and synthesis has also increased of FCG. It was concluded that active participation and student-centered learning ensured through the use of videos that maintain students' attention and enable them to concentrate on the content. Therefore, it is recommended that English teachers may use FCT in their respective schools and use resources for enhancing students' performance.

KEYWORDS: Flipped classroom model, academic performance, pre-test, post-test, English language.

INTRODUCTION

Recently there has been much concern expressed about quality teaching in educational institutions, while industries in the rapidly changing society have been concerned about the well-educated person. These concerns have led to the issue of teaching strategies and their effectiveness in secondary education (Kahler, 1995; Moore, 1994; Rollins, 1989). As an educationist, it is our responsibility to ensure adequate teaching and learning as necessary to meet the changing needs of the students (Mellion, 1995, p.5). According to Carkhuff (1981), teaching is the opportunity to help others to live their lives fully, which means we help to give to our learners' lives through their physical, emotional, intellectual and social growth. Anderson (1994) concluded that student outcomes may heavily depend on the teacher's instructional planning, teaching method selection, and having a variety of learning activities.

Students come from different backgrounds and have varied experiences and abilities. Good teaching is not only dependent on teaching strategies or their effectiveness but it also depends on individual needs and adequacy of the content. Dyer and Osborne (1995) proposed that "the selection of an appropriate teaching approach is one of the most important processes to have teaching success and student achievement" (p. 260). Joyce and Weil (1986, in Dyer and Osborne 1995), further stated that "students react differently to different teaching methods, and that the selection of the proper method is critical to the learning style of those being served by the instruction" (p. 260). There is an assumption that students learn with different styles, at different speeds, different levels of prior knowledge and different environments when the subject matter is given by way of a variety of teaching strategies.

There are as many different kinds of teaching techniques used in classrooms. Many studies like flipped classroom as an alternative to the traditional learning environments have been increasingly attracting the attention of researchers and educators. The advancement in technological tools such as interactive videos, interactive in-class activities, and video conference systems paves the way for the widespread use of flipped classrooms (Johnston, 2017). It is even asserted that the flipped classroom, which is used to create effective teaching environments at schools, is the best model for using technology in education (Uzunboylu & Karagozlu, 2015). Studies about the flipped classroom appear in different disciplines including information systems (Davies et al., 2014), engineering, sociology, and humanities (Kim et al., 2014), mathematics education (Zengin, 2017), and English composition (Zhonggen & Wang, 2016).

The FCT is a new pedagogical model where the instructor shares predetermined digital resources with students through a platform outside the classroom, and related content is also taught through this outside platform asynchronously (Bergmann & Sams, 2012). Inside the classroom, active, collaborative, and interactive problem-solving activities and consolidation practices are carried out (Toto & Nguyen, 2009). Thus, learners are more active in the class, internalizing the contents through a wide range of classroom tasks

(Crouch & Mazur, 2001). Bishop and Verleger (2013) contended that a flipped classroom is an educational technique which consists of two significant components: (1) the use of computer technologies such as video lectures and (2) the involvement of interactive learning activities.

Moreover, lessons should include four major components in order to be entitled as the Flipped Classroom (Flipped Learning Network [FLN], 2014). First, educators should restructure the learning environment and time in a flexible way, considering the individual and group expectations and needs. Second, instructors need to teach the contents in detail, adopting a learner-centered approach and provide rich learning opportunities and activities reflecting a particular learning culture for the specific groups of students. Third, educators should regularly keep track of the difficulty level of the contents and the notes taken by the students as well as their progress, and they also apply active learning strategies that will maximize conceptual understanding of the students. Finally, the instructor should be a professional educator who continuously monitors students in their learning processes, immediately provides feedback, and assesses students' outputs.

It is stated that applying Bloom's taxonomy to a flipped course increases students' learning outcomes, enables student-paced lectures, more personalized learning (Srivastava, 2014), and as passive learning (remembering and understanding) is covered through students' studying the fundamental course material provided with video lectures prior to class, students are more prepared to apply the knowledge and participate in higher-level discussions with their peers and the course instructor, which also enables them to have the support of their peers and the course instructor (Brame, 2013). In this respect, students are expected to be able to manage their own learning process, be self-regulated learners and active in the lesson. Furthermore, FCA enhances active learning stages of Bloom's taxonomy (applying, evaluating, reorganizing) as students are required to participate in higher-order thinking tasks such as analysis, synthesis, evaluation, and reflection through various activities done in the classroom (Tabrizi & Rideout, 2017).

Studies in related literature show that videos are often used as a means of teaching outside the classroom, while interactive tasks in which the students are actively participating are used as in-class activities (Basal, 2015; Graziano, 2017; Herreid & Schiller, 2013; Hsu, 2017; Lage et al., 2000; Roehling et al., 2017; Song & Kapur, 2017; Zengin, 2017). Active participation and student-centered learning can be ensured through the use of videos that maintain students' attention and enable them to concentrate on the content (Herreid & Schiller, 2013). Taking advantage of the technology, instructors both create video materials and make use of the open access videos available on the Internet (Sherer, & Shea, 2011).

In recent studies, the impacts of the FCM on student performance, engagement, learning outcomes, and motivation have been investigated. Studies have shown that the FC approach enhances student's learning performance (Baepler et al., 2014; Davies et al., 2013; Janotha, 2016; Sun & Wu, 2016; Talley & Scherer, 2013; Wiginton, 2013; Zengin, 2017;

Zhonggen & Wang, 2016), produces enhanced learning outcomes (Chen Hsieh et al., 2017; Gillispie, 2016; Kong, 2014; Smallhorn, 2017) and increases student motivation (Chyr et al., 2017; Graziano, 2017; Smallhorn, 2017; Wiginton, 2013; Yılmaz, 2017). Although most of the research suggests that the FCM positively impacts students' learning, there are also studies which have not revealed anticipated positive effects. For example, Smallhorn (2017) did not find an observable increase in students' academic achievement. In another study conducted by Kim et al. (2014), they stated that there was no evidence that the FCM contributed to increased student grades. Similarly, in a study by Sun and Wu (2016), the use of the FCM did not impact teacher-students interaction and learning satisfaction.

In recent years, several research studies have focused on the impacts of FC learning environments on students' academic achievements, one of which was conducted by Zengin (2017). In this study, the learning environment was designed using the FCM alongside Khan Academy and free open source software (Zengin, 2017). The aim of this research was to investigate the impact of the FCM on students' academic achievement and reveal their opinions about this model (Zengin, 2017). The participants of the study included 28 students in the Mathematics Teaching Program at a state university in Turkey, and the results of the study revealed that the FC learning environment, designed using both Khan Academy and mathematics software, doubled the students' academic success (Zengin, 2017). Moreover, it was found out that this learning approach facilitated student learning, enabled visualization in mathematics teaching, and contributed to permanent learning (Zengin, 2017).

In their mixed methods research, Zhonggen and Wang (2016) investigated the effectiveness of the FCM on English writing courses. The data of the study were collected through a scale of satisfaction, a Business English writing test, and a structured interview (Zhonggen & Wang 2016). As pre and post-tests, they administered the scale of satisfaction and a Business English writing test (Zhonggen & Wang 2016). The findings showed that members of the experimental group, who were taught using the FCM, scored higher on the aforementioned scales than the control group members, who were taught in a traditional learning environment (Zhonggen & Wang 2016).

There is a dire need to make research-based decisions for the improvement of students' performance regarding the use of English language in appropriate manner. The conventional and out-dated methodologies seem inappropriate for teaching and learning English language. For the implementation of curriculum, we need sound and effective teaching methodologies. Literature suggests that FCM is an innovative pedagogical technique where the instructor shares predetermined instructional content, often digital resources with students through a platform outside the classroom and related content is also taught through this outside platform asynchronously (Bergmann & Sams, 2012). The FCM also meets the wide range of students learning needs (Goedhart et al., 2019). The FCM can stimulate higher-order thinking and enhance teacher-student interaction (Bergmann & Sams, 2012). It offers flexible instructional time, creates a dynamic and interactive learning

environment, and allows for a deep investigation of concepts (Amiryousefi, 2017; Chen Hsieh et al., 2017; Francl, 2014). This technique grasps the students' attention towards learning the new content, increase in cognition, psychomotor skills using resources outside the classroom. This movement includes a new technique that grasps the students' attention. According to Srivastava (2014) applying Bloom's taxonomy to a flipped course increases students' learning outcomes, enables student-paced lectures, more personalized learning. But unfortunately, in Pakistan least attention is paid on the suggestive techniques to implement the curriculum and fulfil the students' needs. Even they never thought about the individual differences in the classroom. Various scholars like Bergmann and Sams (2012); Nolan and Washington (2013) argued that FCM enhances students' academic achievement. Moreover, the FCM has become a hot topic in the field of foreign language teaching (Wang, An, & Wright, 2018) and in English composition (Zhonggen & Guifang, 2016). Thus keeping in view, the current situation and on the basis of literature review, this study highlighted effect of FCM on teaching of formal and lexical aspects of English language at higher secondary level.

The purpose of this experimental study is to examine effect of flipped classroom model on students' academic achievement in lexical aspects of English language. The effect of flipped classroom model (independent variable) was determined on academic achievement in formal and lexical aspects of English language (dependent variable). The groups of students were defined in the research that included; experimental and control groups. The groups of the participants were measured through MCQs test that is essential to know the difference in academic achievement of students in pre and post-tests.

RESEARCH QUESTION
1. How does flipped classroom model affect students' academic achievement in formal and lexical aspects of English language as compared to non-flipped classroom model?

RESEARCH HYPOTHESES

$H_0$1:   There is no significant difference between flipped classroom group (FCG) and non-flipped classroom group (NFCG) in lexical aspects of English language.

$H_0$2:   There is no significant difference in knowledge towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

$H_0$3:   There is no significant difference in comprehension towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

H$_0$4: There is no significant difference in application towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

H$_0$5: There is no significant difference in analysis towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

H$_0$6: There is no significant difference in synthesis towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

H$_0$7: There is no significant difference in evaluation towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

METHODS

Research Design
The true experimental pre/post-test equivalent group research design was used (Blazquez et al., 2019). Two groups were made, namely FCG and NFCG. To validate effects of flipped classroom model on academic achievement of students in learning lexical aspects of English language, FCG and NFCG were given pre-test at the beginning and the post-test at the end of the study. The FCG was given treatment in the research; FCG and NFCG were taught by two different teachers having same teaching experience and qualification. The volunteer teachers for FCG and NFCG were selected through proper consent. The FCG instructor was given first two-week orientation to introduce the FCM in classroom.

Participants
The participants of research comprised of 850 students of 12th class enrolled in the public sector schools in the District Haripur, KP, Pakistan (EMIS, 2020). At the first stage, purposive sampling technique was used for selection of school because it provides required strength of students for experiment (Creswell, 2013). Then randomization was used to assign students into groups in second stage. At the next stage, names of group were allocated as i.e. flipped classroom group (FCG) and Non-Flipped classroom group (NFCG). The study includes 150 students in GHSS No. 1 Haripur. The flyer cases were excluded after pre-test performance of students. The both experimental and control group included 40 students each.

Research Tool
The MCQs test was used in this experimental research. The test was prepared through textbook of English having items with four possible distractors. The 72-item MCQs test constituted from the SLOs of competency 4 standard 3 and following benchmarks.

1) Competency 4 (Formal and Lexical Aspects of Language)
   a) Standard III (Grammar and Structure)
      i) Benchmark I (Grammatical Functions and Concepts of tense and aspects, transitional devices and modal verbs).
      ii) Benchmark II (Punctuation)
      iii) Benchmark III (Sentence Structure).

Validity and Reliability of Tool

Validity of the both tools i.e. MCQs test was checked by panel of experts who are specialized masters in English and self-efficacy scale from educational psychologist expert in the University of Haripur (Appendix-). The errors, mistakes and suggestions have been incorporated accordingly.

The MCQs test was pilot tested among 20 students other than sample to make it reliable. The MCQs test administered to 12th grade students in Govt. Higher Secondary School Sara-i-Saleh Haripur in December 2021. The data analysed, which was collected and entered in Excel. Reliability Split-Half coefficient is the degree of internal consistency of the test based on normal inter-item correlation. Fraenkel and Wallen (2003) proposed that the least reliability coefficient ought to be at slightest 0.70 and preferable higher. Therefore, the reliability coefficient of MCQs test was (r= 0.837), which is satisfactory and to be utilized in pre/post-tests.

Data Collection and Analysis

The data collected from actual participants of research before and after experiment. Afterwards, the data was analysed using SPSS version 23. The t-test along with Cohen's d effect size was used to determine the difference through mean values.

RESULTS

H_01: There is no significant difference between flipped classroom group (FCG) and non-flipped classroom group (NFCG) in lexical aspects of English language.

Table 1 Comparison of MCQs test score between control and experimental group in post test

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d
Control	40	30.6500	5.05128	.79868	-6.204	.000	1.387
Experimental	40	37.8750	5.35981	.84746			

Significant at 0.05 Level

The table 1 illustrated the comparison of MCQs test score between control and experimental group in post-test in which control group (N = 40, Mean = 30.6500, SD = 5.05128 and SE Mean = 0.79868) and experimental group (N = 40, Mean = 37.8750, SD =

5.35981 and SE Mean = 0.84746) have performed better than control group as showed by t-value (-6.204) and p-value (0.000 < 0.05) with effect size (1.387). The researcher failed to accept the null hypothesis.

$H_0$2:   There is no significant difference in knowledge towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

Table 2 Comparison of knowledge score between control and experimental group in post test

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d
Control	40	6.8500	1.88856	.29861	-2.946	.004	0.659
Experimental	40	8.2000	2.19790	.34752			

Significant at 0.05 Level

The table 2 revealed the comparison of knowledge score between control and experimental group in post-test in which control group (N = 40, Mean = 6.8500, SD = 1.88856 and SE Mean = 0.29861) and experimental group (N = 40, Mean = 8.2000, SD = 2.19790 and SE Mean = 0.34752) have out-performed better than control group as showed by t-value (-2.946) and p-value (0.004 < 0.05) with effect size (0.659). The researcher failed to accept the null hypothesis.

$H_0$3:   There is no significant difference in comprehension towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

Table 3 Comparison of comprehension score between control and experimental group in post test

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d
Control	40	6.0250	2.23592	.35353	-2.841	.006	0.635
Experimental	40	7.3750	2.00879	.31762			

Significant at 0.05 Level

The table 3 showed the comparison of comprehension score between control and experimental group in post-test in which control group (N = 40, Mean = 6.0250, SD = 2.23592 and SE Mean = 0.35353) and experimental group (N = 40, Mean = 7.3750, SD = 2.00879 and SE Mean = 0.31762) have out-performed better than control group as showed by t-value (-2.841) and p-value (0.006 < 0.05) with effect size (0.635). The researcher failed to accept the null hypothesis.

H₀4:   There is no significant difference in application towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

Table 4Comparison of application score between control and experimental group in post test

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d
Control	40	4.1000	1.39229	.22014	-4.860	.000	1.087
Experimental	40	5.6500	1.45972	.23080			

Significant at 0.05 Level

The table 4 exhibited the comparison of application score between control and experimental group in post-test in which control group (N = 40, Mean = 4.1000, SD = 1.39229 and SE Mean = 0.22014) and experimental group (N = 40, Mean = 5.6500, SD = 1.45972 and SE Mean = 0.23080) have clearly out-performed better than control group as showed by t-value (--4.860) and p-value (0.000 < 0.05) with effect size (1.087). The researcher failed to accept the null hypothesis.

H₀5:   There is no significant difference in analysis towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

Table 5 Comparison of analysis score between control and experimental group in post test

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d
Control	40	4.0500	1.50128	.23737	-4.022	.000	0.899
Experimental	40	5.3500	1.38767	.21941			

Significant at 0.05 Level

The table 5 presented the comparison of analysis score between control and experimental group in post-test in which control group (N = 40, Mean = 4.0500, SD = 1.50128 and SE Mean = 0.23737) and experimental group (N = 40, Mean = 5.3500, SD = 1.38767 and SE Mean = 0.21941) have achieved better than control group as displayed by t-value (-4.022) and p-value (0.000 < 0.05) with effect size (0.899). The researcher failed to accept the null hypothesis.

H₀6:   There is no significant difference in synthesis towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

Table 6 Comparison of synthesis score between control and experimental group in post test

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d
Control	40	4.3000	1.77157	.28011	-4.233	.000	0.947
Experimental	40	5.7750	1.31046	.20720			

Significant at 0.05 Level

The table 6 illustrated the comparison of synthesis score between control and experimental group in post-test in which control group (N = 40, Mean = 4.3000, SD = 1.77157 and SE Mean = 0.28011) and experimental group (N = 40, Mean = 5.7750, SD = 1.31046 and SE Mean = 0.20720) have achieved better than control group as displayed by t-value (-4.233) and p-value (0.000 < 0.05) with effect size (0.947). The researcher failed to accept the null hypothesis.

$H_0$7:   There is no significant difference in evaluation towards lexical aspects of English language between flipped classroom group (FCG) and non-flipped classroom group (NFCG).

Table 7 Comparison of evaluation score between control and experimental group in post test

Groups	N	Mean	SD	SE Mean	t value	Sig.	Cohen d
Control	40	4.8000	1.53923	.24337	-1.993	.050	0.446
Experimental	40	5.5250	1.70951	.27030			

Significant at 0.05 Level

The table 7 demonstrated the comparison of evaluation score between control and experimental group in post-test in which control group (N = 40, Mean = 4.8000, SD = 1.53923 and SE Mean = 0.24337) and experimental group (N = 40, Mean = 5.5250, SD = 1.70951 and SE Mean = 0.27030) have achieved better than control group as displayed by t-value (-1.993) and p-value (0.050 < 0.05) with effect size (0.446). The researcher failed to accept the null hypothesis.

DISCUSSIONS AND CONCLUSIONS
The FCT has tremendous results as it increased students' academic achievement in lexical aspects of English language in current study. FCT involves videos are often used as a means of teaching outside the classroom, while interactive tasks in which the students are actively participating are used as in-class activities (Basal, 2015; Graziano, 2017; Hsu, 2017; Roehling et al., 2017; Song & Kapur, 2017; Zengin, 2017). In this study, these videos increased students' interest and academic achievement. Moreover, it is concluded that active participation and student-centered learning can be ensured through the use of videos that maintain students' attention and enable them to concentrate on the content (Herreid & Schiller, 2013). Taking advantage of the technology, instructors both create video materials and make use of the open access videos available on the Internet (Sherer & Shea, 2011).

This study highlighted level of learning through Bloom's taxonomy. The results showed that students' passive learning (remembering and understanding) and high order

learning or active learning (application, evaluating and synthesis) has significantly increased. According to Srivastava (2014), flipped course increases students' learning outcomes, enables student-paced lectures, more personalized learning. Therefore, it was concluded that students' studying the fundamental course material provided with video lectures prior to class, students are more prepared to apply the knowledge and participate in higher-level discussions with their peers and the course instructor, which also enables them to have the support of their peers and the course instructor (Brame, 2013).

RECOMMENDATIONS
The following recommendations were made;
  i. The English teachers may use FCT in their respective schools and use resources for enhancing students' performance.
  ii. The study showed students' interest towards learning process; therefore, teachers may use digital resources in their lessons that involve active participation of students.
  iii. The teachers may utilise FCT in their respective subjects that can reflect higher order learning.
  iv. FCT may integrated in professional development courses that can be taught to teachers and motivate them to use this technique by giving them remuneration and appraisal.

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