On the Effect of Flipped Classroom on Learners' Achievement, Autonomy, Motivation and WTC: Investigating Learning and Learner Variables*

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Abstract

Pitfalls inherent in traditional approaches and methods and movement into post-method frameworks and reaping the benefits of technological advancements gave birth to flipped instruction as a newly emerged practice of teaching. A robust literature has submitted proofs on the merits of this practice in language learning. Availing an innovatory perspective, the current research was an attempt to investigate the effect of this practice on a number of learning and learner related variables in Iranian intermediate language learners. To this aim 39 learners were selected through convenience sampling, and after removing outliers, 29 learners were randomly assigned to control (N=14) and experimental (N=15) groups. For each variable, a valid instrument was selected or adopted from the literature and modified for the purpose of the study. Then, employing a post-test-only control-group design, their performance on the post-test was measured and analyzed through one-way analysis of variance. The outputs revealed a statistically significant difference between groups in achievement (F (1, 27) = 9.627, p = .004) and autonomy (F (1, 27) = 8.308, p = .008) while indicating no significant effect on motivation and willingness to communicate, though motivation was promoted to a small extent. Some of these findings are in line with major currents of research in the literature but others stand in sharp contrast. Further investigation is required to examine into the nature of these findings through qualitative perspectives, interviews and open-ended questionnaires. These findings have implication for educational researchers, language teachers, language learners and applied linguists.

Introduction

Newly emerged theoretical movements in the world of language teaching and learning have submitted proofs on a bulk of deficiencies inherent in traditional approaches and methods (Nunan, 1999). Considering these deficiencies, newly emerged theories and approaches toward teaching have arrived at a consensus of opinions about some core principals which promote the profession. Among these principles, learners' autonomy, heuristic learning, transformation of teaching (rather than transmission) and glocalization of methods and materials, accept critical importance (Kumaravadivulu, 2005). Among newly approaches in teaching which is in line with these post-method concepts, is flipped classroom. For instance, the traditional approaches employ didactic lecture as their primary tool to transfer knowledge to the student while flipped classroom approach underscores transformation of knowledge, (Mehta, et al., 2013). Meeting students needs (Murray, et al., 2014), increasing learning opportunities (Means, et al., 2013), enjoying merits of technology (Della Ratta, 2015), displacing mere teacher-driven classroom (Hamdan, et al., 2014) and learner autonomy (Vaughan, 2014) are other demerits of classical approaches which are compensated for in flipped classroom.

Assigning task to students in advance of classroom and devoting class time to higher order actives has been a common technique among teachers but introduction of content through the agency of technology outside the classroom changed this technique into a well-defined teaching practice, known as flipped-classroom (Touchton, 2015 and Strayer, 2012). According to Oraif (2018), prior exposure to content before receiving instruction in the classroom is one of the fundamental elements of flipped classroom in a way that new content is laid open to students in advance of the classroom through podcasts, online presentations, online interactions, and other types of digital format. Thus, they practice and examine their abilities before the class. Then, students practice their skills and reiterate knowledge with peers and instructors and receive feedback inside the classroom.

A bulk of research in a variety of areas associated with flipped classroom and its underlying philosophy has shown that this practice shows a true potential for solving some of language learning problems in foreign language learning contexts. Dörnyei and Ushioda (2010) believe that personal control over the material, which is exercised in flipped classroom, fosters learners' autonomy. Besides, flipped classroom is approached in a way that creates a supportive environment while, according to Balck and Deci (2000) and Jones, et al (2009), supportive environment of learning satisfies students' psychological needs for competence, autonomy and relatedness. In the same line, Svalberg (2009) has concluded that flied classroom increases language and task-based engagement and promotes learning. Niemiec and Ryan (2009) also asserted that that informative feedbacks given in flipped classroom systems promotes learning and last, but not the least, Chen and Jang (2010) stated that membership in flipped classroom groups promotes sense of belonging to a social group which in turn, satisfies the psychological needs of relatedness.

These are some of those critical problems with most of which Iranian EFL learners are faced. Considering these merits and availability of technological tools and feasibility of flipped classroom in the country on one hand and lack of satisfactory and comprehensive research in this area on the other, the current research was an attempt to investigate the effect of this approach on four different central variables of proficiency, autonomy, motivation and willingness to communicate (WTC) among Iranian language learners. The logic behind selection of these variables can be followed in the literature on flipped classroom some areas of which are touched above. Therefore, the following research question is posed for further investigation:

Does flipped classroom have any significant effect on achievement, autonomy, motivation and WTC of Iranian language learners?

Literature Review

Although there is not an agreed-upon definition or theoretical underpinning for flipped classroom in the literature, a consensus exists over some fundamental components which form the building blocks of

flipped classroom (He, 2016). Pre-class instruction, as a primary component, is supported by some robust theories in the world of learning such as schema theory which states that acquisition and recall of information is best fostered when newly leaned materials are subsumed under previously constructed cognitive network and existing knowledge (Shiffirin and Schneider, 1977). This idea is also closely linked with cognitive load theory which suggests that putting to much cognitive load on working memory results in failure in comprehending new materials (Sweller, 1994). One more mandatory component of flipped classroom is active learning inside the classroom in which previously touched materials are elaborated on (Tucker, 2012). The theoretical roots of this component can be found in processing theory which assumes that type and depth of elaboration on newly learned materials determines the amount of acquisition and recall (Craik and Lockhart, 1977). Localization of teaching and learning style, student-centered classroom and meeting student needs can be explained by a variety of theories in language and psychology (Coorey, 2016; Correa, 2015 and McLaughlin et al., 2014), those the further investigations of which is beyond the capacity of the current study. Modified teacher's role is one more component of flipped classroom the theoretical roots of which have cut off themselves from newly emerged perspectives in post-method pedagogy such as knowledge transformation (Kumaravadivelue, 2005) and adult learning theory (Leigh et al,. 2015) that underscores the necessity of open communication between faculty and learner.

Viability and feasibility of flipped classroom, due to its theoretical rootedness and technological advancement, attracted many researchers in the fields of education in general and language learning in particular. In order to investigate the effect of flipped classroom on students' self-efficiency and engagement, Rama (2019) conducted a qualitative study and submitted proof on the existence of a positive correlation. Also, Vaezi, et al., (2019) investigated Iranian students and teachers' perception of flipped classroom and found positive perception regarding adopting of the approach for language learning. In addition,

in a study that was closest one in scope with the current research, Mohammadi et al. (2019) studied the effect of flipped classroom on student's achievement and WTC. Using a pre-test/post-test design and t-test for analyzing data, they concluded that the intervention significantly promotes both dependent variables. Besides, Oraif (2018) blended flipped classroom with normative practice to investigate its impact on intrinsic motivation and learning outcomes of EFL learners in writing skill. To this aim he selected 55 students to be treated and then evaluated in a pre/post-test design. The data were collected through questionnaires and then analyzed and interpreted through correlation analyses. The findings of the study showed that flipped classroom is positively correlated with both writing and intrinsic motivation.

However, aimed at filling some gaps in the literature and attaining a more comprehensive understanding of this effect on both learning and learner related variables, the current research was an innovatory attempt which employed new instrument and analytical tests to addresses four different dependent variables of achievement (learning variable) and motivation, autonomy and WTC (learner variables) of Iranian intermediate EFL learners.

Methodology

Participants
The current research utilized a post-test-only control-group design. To this aim, 39 male and female adult language learners were selected through convenience sampling procedure from Safir Language Academy in Birjand. Although these participants were already in a homogenous proficiency level (just starting the 3rd book of four corners series), to remove any possible outlier, a selection test, adopted from the teacher manual of the series, was administered and four of them were removed as outlier. A version of adopted scales of motivation, autonomy and WTC were also administered to them and outliers were identified and removed from the study. Then, 29 other participants were randomly assigned to control (N=14) and experimental groups (N=15). The experimental group underwent a flipped instruction for 20 sessions

while the control group attended a settled and normative language learning course for twenty sessions too.

Instruments

Considering the research question and existence of four dependent variables, four different instruments were employed in this study:

A) *Achievement test:* In order to investigate the effect of flipped classroom on student's achievement, an achievement test was adopted from quiz inventory of four corners series (book 3). The test examined the learners' achievement on contents of first and second units of the book and encompassed items on reading, writing, listening, grammar and pronunciation which served as post-test of achievements for both experimental and control groups.

B) *WTC Scale:* in order to measure the learners' willingness to communicate, the Willingness to Communicate in a Foreign Language Scale (WTC-FLS) developed by Baghaei (2011) was adopted. This scale encompasses 20 different items that deals with different components of the construct. In order to produce continuous data, the scale was translated into Persian and modified to fulfill the aims of the study. Face validity of the scale was verified by panel of experts in Safir language academy. Also, the reliability of the modified scale was estimated in a pilot study on 45 language students in Birjand University (Cronbach's alpha was 0.811).

C) *Autonomy Scale:* Dixon's scale of quantitative measurement of autonomy (2011) was selected for the purpose of this section. This scale encompasses 45 items covering 7 different factors of meta-cognition, linguistic confidence, information literacy, self-reliance, making choices, social comparisons and levels of controls. This scales, was, too, modified for the context of the study and its face validity and reliability were verified through appropriate measures (Cronbach's alpha was 0.783).

D) *Motivation Scale:* In order to investigate the effect of flipped classroom on students' motivation, the modified version of Harper's scale, coordinated to Iranian context by Bohrani (2009), was selected for this study. This scale has 33 items and results in quantitative scores between

33 and 165. The reliability and validity of the modification was also verified by Moghimian and Karimi (2012).

Procedure

In order to exercise flipped instruction in our quasi-experimental design, the standard model of filliped classroom was used in which language learners were assigned pre-class tasks including videos, audios and reading online materials related to the upcoming in-class task. These materials were selected from four corners book series and shared with students in a two month period through the agency of a social network. These materials were elaborated on in class as a blended instructional activity.

Data Collection and Analysis

Since the study had employed a post-test-only control-group design (the pre-tests were used for removing outliers rather than a baseline), after two-month intervention (20 sessions) of covering the first two units of the four corners (book 3) through flipped instruction, the students were administered the scales. The parametric data obtained were gathered and entered into SPSS (version 21) and analyzed through one-way ANOVA.

Results and Discussion

The one-way analysis of variance was used to determine whether there are any statistically significant differences between the means of experimental and control groups on four dependent continuous variables. The outputs of this test are presented in Tables 1 and 2.

Table 1

Descriptive Statistics of ANOVA for dependent variables on post-test

		N	Mean	Std. D	Std. E	95% C I Lower Bound	95% C I Upper Bound	Min	Max
Motivation	Control	14	76.07	27.170	7.262	60.38	91.76	26	125
	Experimental	15	65.73	39.507	10.201	43.86	87.61	19	143
	Total	29	70.72	33.923	6.299	57.82	83.63	19	143
Autonomy	Control	14	18.50	6.406	1.712	14.80	22.20	9	33
	Experimental	15	25.33	6.355	1.641	21.81	28.85	11	35
	Total	29	22.03	7.164	1.330	19.31	24.76	9	35
Achievement	Control	14	14.93	3.125	.835	13.12	16.73	10	19
	Experimental	15	17.67	1.345	.347	16.92	18.41	15	20
	Total	29	16.34	2.716	.504	15.31	17.38	10	20
WTC	Control	14	15.43	2.709	.724	13.86	16.99	9	19
	Experimental	15	15.87	1.457	.376	15.06	16.67	13	19
	Total	29	15.66	2.126	.395	14.85	16.46	9	19

As it can be seen in Table 1, the flipped classroom did not resulted in better motivation scores for experimental group (M= 65.73) in post-test of the study and control group outperformed in motivation (M=76.07). However, in autonomy (M=25.33), achievement (M= 17.67) and willingness to communicate (M=15.87) scales, the experimental group performed better in the post test than control groups with means of 18.50, 14.93 and 15.43 respectively. In spite of that, these descriptive statistics do not determine whether these differences between group means are statistically significant or not. Therefore, the output of ANOVA table (Table 2) is presented to examine any meaningful difference.

Table 2

One-Way ANOVA output for dependent variables

		Sum of Sqs	*df*	*Mean Sq*	*F*	*Sig*.
Motivation	Between Groups	773.931	1	773.931	.664	**.422**
	Within Groups	31447.862	27	1164.736		
	Total	32221.793	28			
Autonomy	Between Groups	338.132	1	338.132	8.308	.008
	Within Groups	1098.833	27	40.698		
	Total	1436.966	28			
Achievement	Between Groups	54.290	1	54.290	9.627	.004
	Within Groups	152.262	27	5.639		
	Total	206.552	28			
WTC	Between Groups	1.390	1	1.390	.300	**.588**
	Within Groups	125.162	27	4.636		
	Total	126.552	28			

If we consider achievement as a variable directly associated with learning and motivation, autonomy and WTC as variables associated with learners, the findings of the table showed that flipped classroom resulted in statistically significant mean difference (at 95 percent of confidence interval) between experimental and control groups only in learning variable (achievement) and one of learner variables (autonomy). In other words, flipped classroom had a significant impact on achievement and autonomy but did not significantly affected motivation and WTC, though promoted WTC to an extent. In other words, there was a statistically significant difference between groups in achievement variable as determined by one-way ANOVA ($F(1, 27) = 9.627$, $p = .004$). Similarly, There was a statistically significant difference between groups in autonomy variables as determined by one-way ANOVA ($F(1, 27) = 8.308$, $p = .008$).

Thus, several important findings can be derived from the results. First, the positive effect of flipped classroom on learners' achievement can be underscored. This part of findings is in line with Mohammadi, et al (2019) who submitted statistical evidence on the effect of flipped instructions on

learners' achievement. In particular, being intervened with tasks of flipped classroom, the participants became more involved with learning materials and found greater exposure and therefore showed more gains on grammar, listening, writing, reading comprehension and pronunciation. These findings are also in line with Abaeian and Samadi (2016), Kirimi and Hamzavi (2017) and Yousefzadeh (2015) who found that flipped classroom exercises significant effect on learning subject matter and reading comprehension of second language learners in different proficiency levels and Al-Harbi, and Alshumaimeri (2016) who supported evidence of significant effect of flipped classroom on grammar of foreign language learner. It also proves the findings of Hsieh et al (2016) who concluded that flipped learning develops idiomatic knowledge of language learners.

Second, the post-test results revealed the meaningful effect of flipped instruction on learners autonomy by placing them and their needs at the core of language learning by releasing teacher's responsibility in favor of students and instilling independence in them through gradual allocation of responsibility and heuristic learning to them through out-of-class assigned tasks. These findings are in line with Muldrow (2013) who states that flipped learning targets learners needs and therefore enhances their autonomy by blending technology with technique. Furthermore, letting students have control over learning and show respect for and trust in "unique individuals who require a unique education are other merits of flipped classroom in favor of autonomy reported by Aaron and Bergmann (2012). Also, finding in first and second variables (achievement and autonomy) stand firm behind Dafei (2007) who proved that the students' English proficiency was significantly and positively related to their learner autonomy. So, one can conclude that learning autonomy and achievement are mutually enhanced and possible effect of flipped classroom on each of them indirectly affect the other. Similarly, Hamciuc and Roux (2014) concluded that classroom and autonomous learning approach can work to enhance student learning within the constraints of a fixed curriculum.

Thirdly, the current research showed that flipped classroom does not have significant effect on autonomy and WTC. This findings stand in sharp contrast with Oraif (2018) who had found that satisfying

learners' need through flipped not only promotes sense of relatedness but also promotes learners' autonomy and intrinsic motivation. These findings are also in dissent with Chung and Lee (2018) that concluded that flipped learning results in significant differences in various components of learning motivation including attention, relevance, confidence and satisfaction between control and experimental group. Further investigation is required to shed light on the reasons behind inefficiency of flipped learning in promotion of motivation among Iranian language learners in this study. In spite of that, these finding are in harmony with researches conducted in other areas of education amongst which is Joshaghannejad and Bagheri (2018) which revealed that, though flipped learning promotes motivation of learners but this change is not significant.

And last but not the least, the findings of the study revealed that flipped classroom did not yield significant effects on WTC of the participants. Not unlike motivation, a number of studies in the literature submit statistical evidence on the significant effect of flipped learning on students' willingness to communication (Mohammadi et al, 2019) while some also reveals contradictory findings because they view WTC as an stable construct which is stable across time and situations (Mc Croskey and Richmond, 1990).

Conclusion

Considering these very facts that method is not a one-size-fit-all approach, transmission teacher-fronted classroom need to be changed into transformation learner-centered environments, students needs and styles are required to be met, benefits of advanced technologies and social media can be reaped and learners in EFL contexts need more language exposure, flipped classroom attracted attention in education. In order to explore the feasibility of this approach in Iranian context, the current study investigated its effect on learner and learning variables of language learners. The results showed that flipped learning significantly affects achievement and autonomy and leaves motivation and WTC marginally affected. Further investigations are required to obtain a more comprehensive picture of the phenomenon through

qualitative interviews and questionnaires. These findings have Implications for language teachers, language earners and researchers in different fields of applied linguistics.

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