



Effect of PCaRD DGB Flipped Learning on EFL Learners' Grammar Skill

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This research examines the employing of a Play Curricular Activity Reflection Discussion (PCaRD) and Digital Game-based (DGB) through flipped learning on the EFL learners' grammar skills to improve their achievement and attitudes. The participants were 66 EFL female intermediate students in Iran; the research was conducted over 10 weeks. A PCaRD DGB flipped learning was used for the experimental group ($N = 33$), and a standard flipped classroom was used for the control group ($N = 33$). Both groups constructed using the same teacher, time, coursebook, and videos. The PCaRD DGB flipped learning provided mobile-based game apps and a game-based feedback mechanism in the form of collaborative response and created a setting in which learners could engage in more grammar activity, pay more attention to their answers, and improving their grammar skills. The results indicated that the PCaRD DGB flipped learning outperformed the standard flipped learning in grammar achievement and in terms of their positive attitudes. The researcher speculates that the PCaRD DGB flipped learning strengthens EFL learners' grammar skills and a positive attitude.

Keywords: flipped learning, gamified flipped language learning, PCaRD, grammar skills, DGB learning

Introduction

Over the last decade, ideas that EFL/L2 learning requires a specific amount of focus on form and that form should, more or less, be learned explicitly have been steadily proceeding forward (Huri Baturay, Daloglu, & Yildirim, 2010). Exactly what teaching activities this implies, nonetheless, remains the subject of substantial controversy up to now. The utilization of information communication technologies has become popular in recent years (Graus & Coppen, 2016; Myhill & Watson, 2013), and investigations measuring the effects of technology-enhanced instruction on grammar course learning have also grown in number (e.g., Liu, Sands-Meyer, & Audran, 2018). One of the popular technology-based approaches for teaching grammar skills in the L2 context is flipped learning.

Flipped learning/teaching is a strong method to developing EFL learners' performance, in which they study learning lecture before class (e.g., by watching videos) and practice the content of the learning material through class (Adnan, 2017; Su Ping, Verezub, Adi Badiozaman, & Chen, 2019; Zou & Xie, 2018). Nonetheless, investigations revealed that novice instructors who were engaged in the flipped learning/teaching revealed anxiety about how to involve learners and make a profit from the freed-up class time, and learners may additionally count the face-to-face education less prepared when instructors performed as a director on the side, rather than a teacher on the scene (Kantisa & Sitthitikul, 2020; Zou, 2020). Game-based learning is quickly increased as researchers demonstrate the benefits of employing games for pedagogical goals by manifesting advances in achievement, motivation, and engagement



(Chang, Liao, & Chan, 2019). Though, instructors encountered problems in planning education with a commercial Digital Game-Based (DGB) learning to achieve learning objects, stated poor guide for learners to understand a complex DGB learning, and described organizational weaknesses such as inadequate technical support (Foster & Shah, 2015). The Play Curricular-activity Reflection and Discussion (PCaRD) is a theoretically sound instructional model for DGB learning which marks some of the aforementioned gaps and biases to help in the integration of games into class. Supposing that DGB learning is useful in improving learner engagement, integration of PCaRD DGB learning in the flipped learning/teaching model may help novice instructors to engage learners.

Review of Literature

Flipped Learning

Flipped learning is based on the learning theory of Bloom's revised taxonomy, whereby students first obtain factual knowledge (the lower levels of cognitive activity), perhaps outside the classroom, and then focus on the application, interpretation, and evaluation (the higher levels of cognitive activity) during the class with guidance from their teachers and classmates (Teng, 2017; Yang, Yin, & Wang, 2018). In fact, flipped learning/teaching is a pedagogical approach in which the conventional notion of classroom-based learning is inverted so that students are introduced to the learning material before class, with class time then being used to deepen understanding through problem-solving activities (Chen & Liu, 2019; Shih & Huang, 2019; Wang & Qi, 2018). Previous findings on flipped learning/teaching for language instruction are prevalent in L2 acquisition, and English is the main target language that was considered. The preclass self-learning, which relates to the transferring of language knowledge in learners' own space and time ere class, is primarily in the construction of videos and associated activities; and the in-class exercises in the organization of group range and time are normally in the form of two or a group discussion, practices, or schemes (Yoon, & Kim, 2020; Zou, 2020). A wide scope of the investigation has been examined the problems regarding learners' achievement, motive, commitment, belief, high-order thought skills, self-regulation, and attitudes toward the flipped language teaching/learning (e.g., Lee & Wallace, 2018; Tadayonifar & Entezari, 2020; Wang & Qi, 2018; Yang et al., 2018; Zarrinabadi & Ebrahimi, 2018). The analysis and data collection techniques and instruments involve tests, performance assessments, questionnaire surveys, conferences, and researcher observation, analysis of log systems or online learning recordings, besides the weekly journals (e.g., Hao, 2016; Kim et al., 2017; Tseng et al., 2018). Regarding the characters of learners who tend to profit most from flipped language learning/teaching, the literature shows that students of more learning practice, the higher level of motive, and more adult age ought to make the most beneficial usage of such an efficient and innovative procedure (Chuang et al., 2018; Collins & Muñoz, 2016). Nevertheless, most earlier investigations were carried among upper-intermediate or advanced learners, and it is doubtful whether intermediate learners who had relatively lower language proficiency levels are capable to profit from flipped learning/teaching.

Gamified Flipped Language Learning

Employing the games in L2 language learning/teaching has been extensively practiced and examined by instructors and researchers (Hung, 2018). Hung et al. (2018) carried out a scoping survey of digital games in language instruction and discovered that different games, such as those like immersive games, prominently massively multiplayer online roleplaying games, tutorial games, exergames, simulation games, and adventure games, had been employed in language learning/teaching. The survey further showed that game-based language learning/teaching highlighted positive outcomes, particularly those correlated with learners' affective or psychological situations and language learning/teaching consequences. Hung (2018) utilized technology-enhanced board games in flipped learning/teaching class

and announced that gamified flipped learning/teaching supported university learners' English learning by increasing their motivation to engage in in-class exercises and overcoming their anxiety of speaking. In another research by Zou (2020), the gamified flipped classroom was utilized to investigate the English learning achievements of primary students.

Nonetheless, investigations revealed that novice instructors who were engaged in the flipped learning/teaching revealed anxiety about how to involve learners and make a profit from the freed-up class time, and learners may also view the face-to-face education as less prepared when instructors served as a leader on the side, rather than a teacher on the stage (Zou, 2020). Regarding that games are useful in improving learner engagement, integration of games in the flipped learning/teaching may help novice instructors to engage learners. Nevertheless, more investigation is required to completely explain how learners are engaged in various academic domains of L2 through game-based flipped learning/teaching concerning systematic instructor interference in the L2 context (Zou, 2020). DGB learning is an innovative way of teaching through games, which employs online or offline games on mobile or web to facilitate learning (Foster & Shah, 2015). But there is some paucity with DGB learning such as the lack of professional learning possibilities, there is likewise an insufficiency of empirically verified DGBL instructional models. DGB learning instructional models are required as they support instructors in integrating their content and instructional expertise, and in modifying the application of games based on the requirements of their educational settings (Foster & Shah, 2015). The Play Curricular activity Reflection and Discussion (PCaRD) DGB learning instructional model is an effort at directing this argument.

Play Curricular Activity Reflection Discussion (PCaRD)

PCaRD stands for playing naturalistic games, a curricular activity which is in relation with the objective of the course, reflection to the answers of the learners in games, and discussion with the classmates and teacher during playing the games (Foster, 2012). The PCaRD is located in a wider frame recognized as the Game Network Analysis (GNA), which was designed for promoting instructors and researchers in carrying game-based learning in class by leading them in game analysis and game integration in an actual or a new curriculum (Foster, 2012). GNA affords the adaptive formation instructors require within their class setting to concentrate on the teaching and content of games and then apply games for promoting education and learning (Foster & Shah, 2015). Accordingly, GNA involves (a) game analysis for technology, teaching, and content employing the Technological Pedagogical and Content Knowledge (TPACK) frame (Foster, 2012; Foster, Mishra, & Koehler, 2011), and (b) the PCaRD model for integrating games in class in a step-by-step method to assist instructors (Foster & Shah, 2012). Besides, the inquiry, communication, construction, and expression (ICCE) frame bridging game analysis and game integration by supporting instructors in the description of learning activities and forms of possibilities that may be lacking in a game (Foster & Shah, 2015). In Figure 1 the framework of GNA is illustrated based on Foster and Shah (2015).

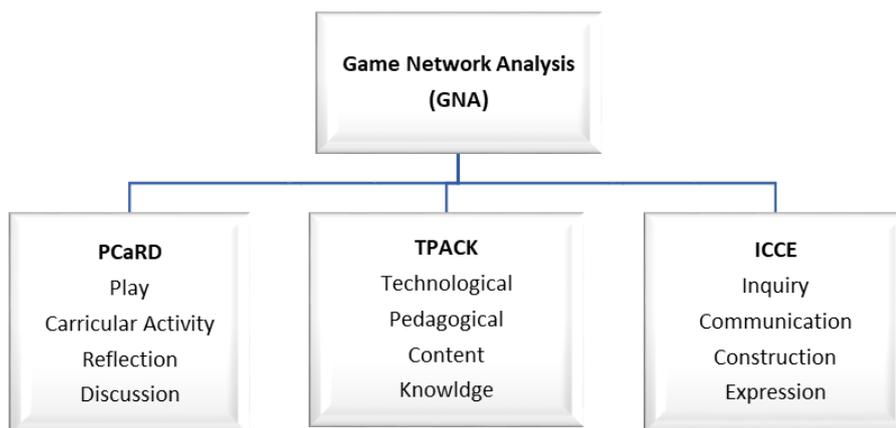


Figure 1. The Game Network Analysis framework by Foster and Shah (2015).

The PCaRD model of game-based learning leverages instructors' technological pedagogical content knowledge (TPACK; Mishra & Koehler, 2006) concerning games for designing learning activities and evaluations (Foster, 2012). TPACK affords a lens for instructors to investigate a game concentrating on education and content (Foster & Shah, 2015). Instructors use their TPACK lens to engage in the PCaRD process (Foster & Shah, 2015). PCaRD is a method to engage learners in naturalistic game-play, reflective of playing regularly with friends, accompanied by engaging in curricular activities designed by instructors that are related to game-play (Foster & Shah, 2015). This is accompanied by reflection assignments on the curricular exercises, including learners writing to express and regulate their opinions about the process from play and curricular exercises (Foster & Shah, 2015). Ultimately, learners engage in discussion tasks directed by learners and instructors to arrange classroom-learning goals from the exercises, what was acquired, and what requires further work (Foster & Shah, 2015). In the PCaRD model, learning is regarded as a situated method including cooperation between the learners, the game, and the class settings with devised possibilities for ICCE (Foster & Shah, 2015). Besides, learning is regarded as a synthesis of learners' knowledge formation and motivational rating of educational content (Foster & Shah, 2015). Therefore, to make DGB learning academically meaningful and especially relevant to learners, PCaRD engages learners in exercises that are susceptible to their locally established experiences (Brophy, 2004). Moreover, the curricular activities, reflection, and discussion in PCaRD are planned by applying anchored education and culturally harmonious pedagogical strategies in difficulties and cases attached to game-play (Foster & Shah, 2015).

This Study

As it was mentioned in the literature the employing the games in the flipped learning can improve the learning of EFL learners in the different course (Zou, 2020), but there are some challenges in front of the EFL teachers to select and employ an appropriate game in the class (Zou, 2020). This research aimed to discover the effects of PCaRD DGB flipped learning on EFL learners' achievement and perceptions in grammar course to fill the gap in the literature. The following questions were formulated to assess the PCARD DGB flipped learning in the EFL grammar course:

- RQ1: What is the effect of PCaRD DGB flipped learning on the achievement of EFL learners' grammar course?
- RQ2: What is the EFL learners' perceptions about PCaRD DGB flipped learning in the grammar course?

Method

Design

A between-subjects design with PCaRD DGB learning in the lecture videos for the intervention condition were used, and standard flipped learning with videos for the control condition. The intervention consisted of 10 lessons (and ten videos) over ten weeks. In this quasi-experimental design (Creswell, 2014), the same teacher taught two preexisting classes.

Participants

A total of 66 female learners (native in Persian) (15-23 years old, $M = 18$, $SD = 2.5$) in a language institute of one of the central cities of Iran, who were asked for their consent, participate in this study. Ethical approval was obtained from the manager of the institute. The language institute has offers three tracks: intermediate, upper-intermediate, and advanced level. The sample consisted of two intact intermediate classes. They were studying English for about 3 years. After administering an Oxford Placement Test (Allen, 2004), it appeared that there were not significant ($p > .05$) differences between conditions in terms of prior knowledge. Consequently, one of the intact classes ($N = 33$) was regarded in the PCaRD DGB flipped learning condition, and the other intact classes ($N = 33$) was regarded in the standard flipped learning condition.

Materials

Learning materials

Edmodo App was used as an online learning environment for sharing the lecture videos with the learners in both groups. Each learner with a personal login that was linked to their corresponding research condition joined the Edmodo App and to the class. The videos were produced and recorded by the researcher. The ten videos were identical for both research conditions, they had an average length of 5 min, and fast-forwarding was disabled when viewing the video for the first time. Teachers discussed the cognitive questions at the beginning of each lesson to recall the content of the lecture videos. During the lessons, learners were actively engaged in utilizing the content of the lecture videos (e.g., analyzing sources of grammar and using them in real-life). During the treatment, the book which was introduced to the learners in both groups was “*Longman English grammar practice for intermediate learners (3rd edition)*” by Alexander (1990).

Digital game-based apps in the PCaRD DGB flipped learning condition

During the treatment in the PCaRD DGB flipped learning the learners during the face-to-face classroom had to use the game apps such as English Grammar Test, Learn English Grammar Games, and English Grammar-Learn & Quiz. The teacher was responsible to download the apps and share them with the learners during the first session and being sure that all the learners in the PCaRD DGB flipped learning had installed the apps on their mobile. Figures 2 and 3 show grammar learning through different apps.



Figure 2. Screenshots from the English grammar test app.

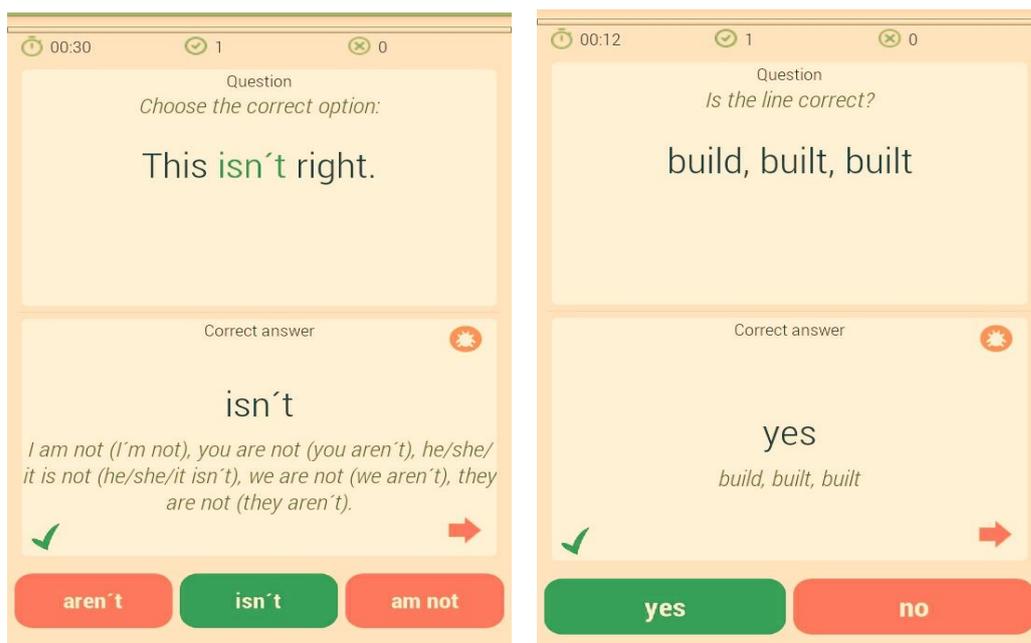


Figure 3. Screenshots from English grammar-learn & quiz.

Measurements

Grammar task as a pre- and posttest

To obtain the data for analysis, two parallel researcher-made grammar knowledge tests were outlined and developed by a board of well-experienced EFL instructors. The board members, who were two EFL instructors, were suggested based on their years of teaching the English language and experience with the learners' coursebook. The tests included the grammatical constructions involved in each lesson of the learners' textbook. The textbook's lessons covered a range of grammatical structures such as passive and active voice, direct and indirect speech, two-word verbs, be going to, present perfect tense, relative

clauses, and gerund structures. Each of the tests contained 20 multiple-choice items and 20 grammaticality judgment items containing all grammar points of the learners' coursebook to assess grammatical knowledge of the learners before and after the treatment. The reliability was calculated as (Item = 40, $\alpha = .95$). The allotted time was 60 minutes and the correct answer to each item received one point. There was no penalty for false responses. At the end of the treatment, a posttest was administered to the participants of the research. The posttest was the second stage of the mixed test of the book whereas the pretest was the first stage. The validity of the posttest was also checked by the teachers who validated the pretest and the reliability was computed as (Item = 40, $\alpha = .89$).

Motivation questionnaire

The motivation of the students was calculated as a pre- and posttest. The pretest was used to examine if the learners in the research conditions were equal in terms of motivation. The Motivated Strategies for Learning Questionnaire (MSLQ) were employed and measured scale means (Pintrich, Smith, Garcia, & McKeachie, 1991). The MSLQ is the common widely used questionnaire that has proven to be a reliable and useful tool for estimating motivational and self-regulated learning constructs (Pintrich, Smith, Garcia, & McKeachie, 1991). The following motivational constructs were employed: intrinsic goal orientation (e.g., *in a class like this, I prefer course material that challenges me so I can learn new things*), extrinsic goal orientation (e.g., *getting a good grade in this class is the most satisfying thing for me right now*), and task value (e.g., *it is important for me to learn the course material in this class*) were used to estimate how learners valued and distinguished their engagement in a particular learning task (e.g., homework for grammar). The reliability calculated for intrinsic goal orientation (Item = 4, $\alpha = .86$); extrinsic goal orientation (Item = 4, $\alpha = .89$); and task value (Item = 4, $\alpha = .90$), which showed a great reliability in a context. At last, the questionnaire was administered in the posttest to analyze if there are significant differences between the pre- and posttest motivation of the EFL learners.

Procedure

The same teacher, coursebook, lecture video, app (Edmodo App) for delivering videos to learners were used, and the same face-to-face class time were used for both control and experimental groups. Before administering the pretest, the motivation questionnaire was administered to the learners of both groups. After assuring that the learners were homogenous in terms of motivation the grammar task was administered as a pretest. Ten weeks were assigned for treatment in both groups. Table 1 shows the general scheme of teaching grammar skill in two groups.

TABLE 1
General Scheme of Teaching Grammar Skill in Two Groups

Weak	Focus
1 & 2	Elaborating on Verbs and tenses
3	Elaborating on Modal verbs
4	Elaborating on Verb forms and structures
5 & 6	Elaborating on Noun, pronoun, determiners
7	Elaborating on Adjective and adverbs
8	Elaborating on Propositions
9 & 10	Elaborating on Building sentences

In the control (standard flipped learning) group, the teacher was responsible to share the lecture video before the face-to-face classroom with the learners. Learners had to watch the videos and after that perform the online quiz in the Edmodo App by the time assigned by the teacher. Then, the time of the

face-to-face classroom was spent on doing exercises of the book and requesting clarification if there was any problem with the learning from the teacher.

Treatments were different in the experimental group (PCaRD DGB flipped learning). The learners just like the control group had to watch the video which was shared by the teacher before class and perform the quiz in the Edmodo App by the deadline assigned by the teacher. In the face-to-face classroom, the time was spent on playing the game based on the curricular plan, receiving feedback from the teacher about the answers to the game, and having discussion with classmates about the games and answers. The game such as English Grammar Test, Learn English Grammar Games, and English Grammar-Learn & Quiz were used to review the lesson. In other words, instead of working on the exercises of the coursebook, learners had to play a game and learn with the help of games, teacher, and classmates. After that, the grammar task was administered as a posttest in both groups to analyze the achievement of both groups. At last, the motivation questionnaire was administered as a posttest to both groups to compare the motivation of the learners in the control and experimental groups.

Data Analysis

First, the descriptive statistics were calculated. Then, the data distribution for normality and potential outliers were analyzed. All the data were normally distributed. Two ANCOVAs (i.e., grammar achievement test and motivation of the learners) in SPSS (Version 21) with the condition as the independent variable was conducted to analyze the data.

Results

Effect of PCaRD DGB Flipped Learning on the Achievement of EFL Learners' Grammar Skills

Descriptive and inferential statistics were conducted to address the first research question. Descriptive statistics of the groups' data were computed to check the normal distribution of data and obtain an estimate of both groups' achievements in grammar skills.

TABLE 2

Descriptive Statistics of Pre and Posttests in the Control and PCaRD DGB Flipped Learning Groups

Tests	Groups	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
Pretest	Control (N = 33)	17.33	3.53	-.04	-.08
	PCaRD DGB Flipped Learning (N = 33)	17.25	3.45	.42	.67
Posttest	Control (N = 33)	20.22	3.21	-.34	-.17
	PCaRD DGB Flipped Learning (N = 33)	35.47	3.46	.45	.96

As displayed in Table 2, the kurtosis and skewness values in the pretest and posttest were small and within the range of ± 2 , suggesting the normal distribution of the data (Bachman & Kunnan, 2005). Also, the grammar mean scores in the pretest were close to each other, indicating that both control and PCaRD DGB flipped learning groups were rather homogeneous before treatment in terms of prior grammar skills. However, the difference between the grammar mean scores looked rather large in the posttest, which was submitted to inferential statistical analysis.

Because the samples were small, the normality and homogeneity test was performed as prerequisite testing before conducting parametric or nonparametric inferential tests (Bachman & Kunnan, 2005). The normality test used in this study was the Shapiro-Wilk test, the results of which demonstrated that the grammar scores were normally distributed both in the pretest [$D(33) = .89, p = .407$ and $D(33) = .91, p = .470$] and in the PCaRD DGB flipped learning posttest [$D(33) = .93, p = .386$ and $D(33) = .93, p = .333$]

for the control and groups, respectively. Moreover, Levene's test for homogeneity of variances demonstrated no significant difference in the variances between the two groups ($F = .19, p = .703$), which all supported the use of a parametric test for further analysis.

Then, a one-way ANCOVA was conducted after checking its assumptions, to address the first research question.

TABLE 3

Analysis of Covariance on the Posttest Writing Scores of the Control and PCaRD DGB Flipped Groups

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected model	195.64	2	96.83	79.79	.000	.765
Intercept	37.82	1	37.71	45.65	.000	.417
Pretest	120.86	1	120.75	130.24	.000	.683
Group	64.11	1	63.01	57.43	.000	.544
Error	34.92	63	1.19			
Total	8413	66				

The ANCOVA results, as displayed in Table 3, demonstrated that the difference in the post-instruction writing scores between the two groups was statistically significant with a high effect size, $F(1, 63) = 56.44, *p < 0.05, \eta^2 = .544$. In conclusion, the PCARD DGB flipped instruction was more effective than the instruction in the control group.

The Effect of PCaRD DGB Flipped Learning on the EFL Learners' Motivation in Grammar Course

Descriptive and inferential statistics were conducted to address the second research question. Descriptive statistics of the groups' data were computed to check the normal distribution of data and obtain an estimate of both groups' motivation in grammar course.

TABLE 4

Descriptive Statistics of Questionnaire Items Scores in Two Groups

Variable	Principles	Groups	N	Min	Max	M	SD	Skewness	Kurtosis
Pretest	Intrinsic	PCaRD DGB Flipped	33	1	4	3.25	.52	.243	.088
		Control	33	2	4	3.28	.56	.076	-.412
	Extrinsic	PCaRD DGB Flipped	33	2	5	3.31	.58	-.511	.168
		Control	33	2	5	3.24	.63	-.118	-.582
Posttest	Task Value	PCaRD DGB Flipped	33	1	4	3.34	.54	.433	.321
		Control	33	1	4	3.31	.52	.512	-.413
	Intrinsic	PCaRD DGB Flipped	33	3	5	4.22	.57	.408	-.216
		Control	33	3	5	3.42	.56	.013	-.744
Extrinsic	PCaRD DGB Flipped	33	4	5	4.41	.52	-.007	-.936	
	Control	33	2	5	3.46	.66	.615	.048	
Task Value	PCaRD DGB Flipped	33	4	5	4.71	.65	.413	.116	
	Control	33	3	5	3.52	.56	.507	-.098	

As can be seen in Table 4, according to the skewness and kurtosis values, data are normally distributed, because, according to Tabachnick and Fidell (2013), if the skewness and kurtosis values are between ± 1.5 , the data show normal distribution. So, the one-way ANCOVA was conducted to answer the second question.

TABLE 5

Analysis of Covariance for the Treatment Effects on Posttest Motivation Score

Dimensions	Groups	Sources	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intrinsic	Control	Corrected model	194.64 ^a	2	96.82	88.89	.000	.834
		Intercept	37.81	1	37.81	36.66	.000	.559
	PCaRD	Pretest	131.85	1	131.85	121.2	.001	.745
		Group	64.01	1	66.01	56.74	.000	.684
	DGB	Error	34.91	63	1.19			
		Total	8221.00	66				
a. $R^2 = .85$ (Adjusted $R^2 = .84$)								
Extrinsic	Control	Corrected model	531.77 ^(a)	2	250.89	51.53	.000	.724
		Intercept	128.85	1	128.85	23.96	.000	.434
	PCaRD	Pretest	145.18	1	145.18	22.22	.000	.447
		Group	351.28	1	361.28	74.79	.000	.665
	DGB	Error	138.72	63	4.27			
		Total	16566.0	66				
a. $R^2 = .73$ (Adjusted $R^2 = .72$)								
Task Value	Control	Corrected model	354.06 ^(a)	2	177.03	67.67	.000	.772
		Intercept	177.37	1	177.37	67.80	.000	.629
	PCaRD	Pretest	172.84	1	172.84	66.07	.000	.623
		Group	184.38	1	184.38	70.48	.000	.638
	DGB	Error	104.64	63	2.62			
		Total	15120.0	66				
a. $R^2 = .77$ (Adjusted $R^2 = .76$)								

The ANCOVA results in Table 5 demonstrate that the difference between the groups' post-training motivational test scores was statistically significant in all the principles of intrinsic, extrinsic, and task value respectively, $F(1, 63) = 56.74, p < 0.05$; $F(1, 63) = 74.79, p < 0.05$; $F(1, 63) = 70.48, p < 0.05$; $F(1, 56) = 97.03, p < 0.05$, with a high partial eta squared value (0.684; 0.665; 0.638; 0.738). When estimated marginal means were obtained, the results showed that the flipped group (Adjusted $M = 4.21, 4.40, 4.70, 4.11$) performed better than the traditional group (Adjusted $M = 3.23, 3.45, 3.50, 3.14$) in the posttest, supporting the statistically greater effect of flipped instruction on the learners' course interest and motivation. It revealed that employing PCaRD DGB learning improve the learners motivation during an experiment.

Discussion

Effect of PCaRD DGB Flipped Learning on the Achievement of EFL Learners' Grammar Skills

This study conducted a 10-week project on PCaRD DGB flipped learning among 66 intermediate EFL learners. First, the results showed that the EFL learners' achievement in a grammar course has been increased significantly more effective than the control (standard flipped classroom) group. The reason may be because of employing technology in a classroom (through DGB learning) and out of the classroom (watching the videos before face-to-face learning). The next reason may be due to the feedback which learners received in a face-to-face classroom when playing the games and the teacher gave them feedback on their answers in a game. It might be the discussion with the classmates in face-to-face learning which helped students to solve their problems and learn better. These results go well with the

researchers who conducted a flipped learning in the EFL context and concluded that using collaborative learning could help in learning better (e.g., Lee & Wallace, 2018; Tadayonifar & Entezari, 2020; Wang & Qi, 2018; Zarrinabadi & Ebrahimi, 2018). Also, the results are in accordance with the research which concluded that using games in the EFL classroom will enhance learning (e.g., Chang, Liao, & Chan, 2019). While they were working together in the PCaRD DGB flipped learning, they could learn more from each other, feel more secure and less anxious, and write in a meaningful way. Thereby, the other reason for the effectiveness of the model could be a high level of collaboration among the learners in this group. As Slavin (1995) argues, cooperative learning affords a non-threatening learning environment that supports EFL learners to express their viewpoints. However, what makes the kind of flipping partially distinct from other forms of common collaborative or team writing is the flexibility in approach through using PCaRD DGB flipped learning.

What made the PCaRD DGB flipped learning a more powerful approach than the traditional one might be due to the cooperative learning which enhanced the learners' engagement in class. Several researchers (e.g., Henning, 2005) have considered the concept of learner engagement, being promoted through discussion and dialogic practice, as a key factor in fostering language skills. It can be argued that the EFL learners in the PCaRD DGB flipped learning group were more engaged in the grammar achievement process and this enhanced engagement helped them learn the framework of the EFL grammar rule better. The next reason might be the flexibility in the teaching/learning approach. The learners of this group had access to the course content outside the class and were free to choose where and when to practice the content, which is viewed as an aspect of course flexibility. According to Shurville, O'Grady, and Mayall (2008), flexible education affords learners with choices about where, when, and how learning happens. Thereby, the current study assumes that flexible learning in the PCaRD DGB flipped learning group assisted the learners to promote the quality of the grammar skill. The aforementioned finding also finds support from the general findings of prior studies about the effectiveness of flipped classroom on L2 grammar course (e.g., Lee & Wallace, 2018).

The Effect of PCaRD DGB Flipped Learning on the EFL Learners' Motivation in Grammar Course

Also, the results demonstrated that the learners generally considered PCaRD DGB flipped learning motivative based on the results of the questionnaire. This result may be due to the satisfaction of the learners in a class because of using games instead of exercises because it may leverage the anxiety of the learners. The other reason may be due to the fact that learners were more motivated to learn when using the technology both in and out of the class because the learners are accustomed to using technology during the life-time. These results go well with those researches which showed that using flipped learning and game-based learning in teaching to EFL learners will motivate them (e.g., Alavi, Borzabadi, & Dashtestani, 2016; Chang, Liao & Chan, 2019; Hung, 2018; Hung et al., 2018). Student opinion, thus, very much echoes the published positive findings concerning the effects of flipped and team-work learning upon students' motivation and interaction with the teacher and teammates. Besides the collaborative learning through the PCARD DGB flipped learning, the integration of game for a student in the team may lead to the improvement of the EFL learners in the experimental group, because students feel confident because they are in the same rank as the teammate's students. These results go well with the results of the study by Eryilmaz and Cigdemoglu (2018), who found that the use of collaborative and flipped learning has a positive effect on the students' perceptions. Besides, another study by Zarrinabadi and Ebrahimi (2018) confirmed the effectiveness of the collaborative flipped learning/teaching on EFL learners' attraction and interest.

Limitation of this Study

This study is limited in that the EFL learners' who participated in a project were all female, and future studies are advised to both genders in conducting research. Moreover, the focus of this study is on learners' achievement and motivation, while issues such as the teacher's perception and motivation are not regarded and future research should have a care about it. The other limitation is involving only a small number of PCaRD DGB flipped learning sessions in the research restricted learners' exposure to the treatment and may influence the results.

Conclusions and Implications of this Study

While investigations on the educational potential of PCARD game-based and flipped learning are burgeoning, few pieces of research have explored their effectiveness for EFL language learning. Also, researches that explore learners' use of and effectiveness towards PCaRD DGB flipped learning for EFL language learning remains scant. The results of this research contribute to the existing body of investigations on PCaRD DGB flipped learning by highlighting the application types in-and-out of the classroom in the EFL context. The results showed that the employment of PCARD DGB flipped learning to improve EFL learners' grammar skills significantly more than the standard flipped learning group. Providing insights into learners' motivation toward language learning by PCaRD DGB and flipped learning, the findings suggest that learners agreed to use the PCaRD DGB and flipped learning to learn grammar skills better.

Hence, educators, apps designers, and curriculum developers in a language discipline, including EFL language learning, should interact to design game apps content that is aligned with course content and its pedagogical objectives to enhance the appeal of technology-based learning instruments for language learners. Also, concerning the fact that different technological game apps require particular types of literacy, it seems vital to provide learners with the relevant knowledge and skills for the efficient use of appropriate game apps. This aim cannot be fully completed without the contribution of researchers and instructors. Regarding the essential role of instructors' know-how, future research should address instructors' perceptions of and proficiency in PCaRD DGB flipped learning and their pedagogical value.

Furthermore, the possible effect of prior successful or unsuccessful experiences with EFL PCaRD DGB flipped learning and attitudes of the learners should be analyzed. Additional experimental researches are needed to shed light on the possible impact of cultural and social factors in shaping learners' acceptance of PCaRD DGB flipped learning. The way personal learning styles and strategies might shape EFL learning via PCaRD DGB flipped learning could be another potential research.

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