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The Relationship between EFL Learners' Flipped Learning Readiness and their Learning Engagement, Critical thinking, and Autonomy: A Structural Equation Modelling Approach

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ABSTRACT

Purpose. The main purpose of this study is to investigate the relationship between Iranian EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy.

Methods. The participants comprised 520 EFL learners studying at various language institutes in the context of Iran. They were chosen according to convenience sampling. In this study, four instruments were used: flipped learning readiness questionnaire, learner autonomy scale, critical thinking inventory, and learning engagement questionnaire. To analyze the relationships among the variables, Pearson's correlation coefficient and structural equation modeling (SEM) was run. Results. The results revealed that flipped learning readiness correlated positively and significantly with three variables: learning engagement, critical thinking, and autonomy. In addition, based on the results, flipped learning is a positive significant predictor of critical thinking, learning engagement, and autonomy. Moreover, engagement is positively predicted by both critical thinking and autonomy. Finally, the results and their implications in the context of language learning were discussed.

Implications.

KEYWORDS

flipped learning readiness, learning engagement, learner critical thinking, learner autonomy, English as a foreign language (EFL) learner

INTRODUCTION

In the last decades, the development of technology has affected various fields of sciences including education dramatically. The goal of applying educational technologies to pedagogical settings is to improve the quality of teaching, instructional materials, and teaching methods to their utmost utility (Berrett, 2012). In particular, the integration of face-to-face classrooms with technological tools is a key factor in the enhancement of teaching and learning context in the 21st century (Arum & Roska, 2011; Graham et al., 2013; McLaughlin et al., 2014). Easy access to educational technologies has changed the way learners learn and the role instructors play (Johnson, Adams Becker, Estrada, & Freeman, 2015). Learners can now look for information online and instructors are no longer the single supplier of information and knowledge. In this new context, instructors have been looking for an instruction model which best meets their learners' needs. Among the most popular new educational technologies, flipped instruction has been considered as one such model (Bergmann & Sams, 2012).

Flipped instruction has been popularized as a creative learning practice for supporting teaching, especially language teaching. As a new form of blended learning, the flipped instruction reverses traditional instruction and rearranges the time of instruction to provide more

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class time for learners to learn (Öztürk & Çakıroğlu, 2021). In this kind of instruction, assignments are assigned to learners before the classroom and the time of class is devoted to higher-order activities. Thus, in the flipped classroom, the content of instruction is introduced to the students using the technology outside the classroom context (Touchton, 2015 & Strayer, 2012). In this type of classroom, students would use asynchronous online lectures along with face-to-face interactions within the classroom (Bergmann & Sams 2013). Thus, the time of the class is devoted efficiently to scaffolding, inspiration, and assistance about the materials presented previously online to the students. Flipped instruction also provides language learners with more chances to be exposed to the L2 language both inside and outside the classroom by the technology-integrated mechanism of learner previews and in-class differentiated education (Bergmann & Sams, 2012).

There are many advantages about the flipped classrooms such as suggesting the individualized learning style for students (Green, 2015), presenting teachers with the customized curriculum (Herreid & Schiller, 2013), and covering various types of material that are not possible to be covered in traditional models (Mason, Shuman, & Cook, 2013). The inclusion of the students and engaging them in the process of learning and developing their critical thinking ability as well as problem-solving skills (Engin & Donanci, 2016; Green, 2015) are other benefits. Critical thinking, creative learning, and complex reasoning skills are the overlooked elements of education (Arum & Roska 2011; Graham et al. 2013; McLaughlin et al. 2014). Some researchers claimed that the application of new digital pedagogies has established a proper base for the development of these skills amongst students. Therefore, the flipped classroom is considered a way for the expansion of the curriculum rather than the instruction of the content in a digital format (Bishop & Verleger, 2013). A great benefit of flipped learning is that students could be engaged with some of the most important parts of the instruction content in advance. In order words, it could be said that teachers can give some hints about what they want to teach before the instruction before the learners attend the class so they can think about the material carefully (O'Flaherty & Phillips, 2015). Thus, studies on this issue are so significant for learners and teachers.

In flipped instruction, learners should take responsibility for their learning by implementing several assignments before the class. According to Han (2015), as the flipped classroom structure needs learners to be actively engaged in learning at the same time with leaner education, the enhancement of learner engagement as well as autonomy could be noticed. Moreover, flipped instruction empowers teachers to provide learners with chances to communicate with each other, as well as to motivate learners by holding discussions, answering questions, and modeling problem-solving activities (Bergmann & Sams, 2012). Thorndike (1932) argued that one rule of learning is the readiness of learners to learn and this can strongly affect the degree of learning achievement. Therefore, this study examined flipped learning readiness and its relation to learning engagement, critical thinking, and autonomy. Regarding the importance of flipped instruction in the EFL context, more studies should be devoted to this issue. Therefore, because of the significance and scarcity of studies in this field, this investigation aimed to engage in this significant issue. Thus, the main purpose of this study is to examine the relationship between Iranian EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy.

Numerous efforts have been taken to examine the effect of technology in developing and designing instructional materials. These steps have been taken to change the traditional classes into pedagogical settings with a high-quality atmosphere. Previously, instructors carried the main burden of lecturing and assigning the homework for the students, while with the growth of online instruction tools (e.g., in the flipped approach) these roles have been changed, the students engaged more in their learning process, and new requirements came into existence. For instance, the issues traditionally discussed in the class are taking place outside the classrooms and online (Lage, Platt, & Treglia, 2000). Among different possibilities for implementing the flipped classroom, student-centered teaching model, promoting cooperative and active learning is one of the bests (Lee & Wange, 2013). The underlying theory for flipped classrooms is the constructivist principles, which asserts students' engagement cultivates their critical thinking activities. In Our changing and challenging world, learners need to go beyond the creation of their knowledge; they require to develop their higher-order thinking skills, including critical thinking and problem-solving (Sezer, 2008).

Among the studies that have been done regarding technology, Yarbro, Arfstrom, McKnight, and McKnight (2014) examined research on flipped learning from K-12 to post-secondary education and found that it can be utilized in most fields, such as math and English as a foreign language (EFL). They also concluded that learners in flipped classrooms were more engaged, act better, or showed fewer behavioral problems. In the case of flipped education and learners' autonomy, Han (2015) examined the effectiveness of flipped classrooms on ESL learners` autonomy based on Strayer's (2007) class-flipping model. According to his findings, flipped classrooms had a significant effect on ESL learners` autonomy. As flipped learning needs students to be actively engaged in learning, the development of learner autonomy could be achieved. Hao (2016) who considered the flipped learning readiness variable, investigated the impact of personal characteristics on their flipped learning readiness levels. According to the results, personal characteristics and individual circumstances affect the levels of readiness. As literature reviewed, the role of flipped learning readiness on learners' learning engagement, critical thinking, and autonomy simultaneously has not been examined yet. Thus, this

study aims to fill this gap and presents implications in the EFL context of language learning.

Considering the role of flipped instruction and technology in education, Moranski and Kim (2016) in another study, examined the effect of presenting grammar content by flipped instruction and technology and traditional methods on third-semester Spanish learners' (*N* = 213) knowledge of the non-agentive clitic pronunciation. They found that FI helps students automatize explicit knowledge, and on the other, that applying educational videos and readings does not negatively affect learners' proficiency to correctly explain complex target structures. Regarding flipped education and learners' engagement, Gasmi (2017) examined the impact of flipped instruction on EFL learners' engagement in academic writing classes in Oman and found this kind of instruction effective. His study represented new practicable knowledge regarding the implementation and implications of flipped learning for EFL learners' engagement in Oman in academic writing. This study presents flipped learning as an educational approach that helps to address learners' lack of behavioral, cognitive, emotional, and agentic engagement in writing courses in the context of Oman.

Considering the learners' attitudes Muniandy (2018, cited in Shahani, Chalak & Heidari Tabrizi, 2021) examined the effectiveness of flipped classrooms on learners` achievement and attitudes towards the English language in secondary education in Malaysia. His results indicated that flipped classroom affects positively learners' achievement and attitudes more than traditional classrooms. Also, the findings revealed that flipped classroom provides greater opportunities for communication between learners and their instructors. Moreover, Vaezi, Afghari, and Lotfi (2019) in their study by a mixed-method research approach examined EFL learners' and teachers' attitudes towards flipped classrooms in an Iranian university context. According to their findings, the learners had positive attitudes towards flipped instruction. Tecedor and Perez (2019) also investigated how learners interpret and experience their roles as students in flipped Spanish courses and how these conceptualizations shape their conduct and beliefs about learning under this new educational approach. They concluded that the major "predictors of liking FIs are (i) being enrolled in an elementary course, (ii) having taken flipped courses in other subject areas, (iii) having a clear understanding of how the online platform works, and (iv) understanding the philosophy behind flipped courses" (p.1). Finally, considering the impact of flipped education on learners' critical thinking, Viriyavejakul (2020) in a study investigated the impact of flipped instruction on undergraduate students' critical thinking and found a positive relationship between them.

The following research question was posed and was examined in this study: Are there any statistically significant relationships between EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy?

METHODS

Participants

A total number of 520 EFL learners (300 female, 220 male) participated in this study from four private language institutes on Kish Island, Iran. Their selection was based on convenience sampling and the participation was entirely voluntary. Because of the lack of access to all Iranian EFL learners, random sampling was not possible and so, the participants were selected by convenience sampling. They were between the age range of 14 and 39 (mean=24.35, SD=4.24). All of them were intermediate learners of English and were able to fill the English version of the scales. Because of the Covid-19 situation, the learners took part in online classes and they took advantage of flipped classroom instruction, so they were familiar with this type of instruction and learning.

Instruments

In this study, one questionnaire, comprised of the following scales, was used: flipped learning readiness questionnaire, learner autonomy scale, critical thinking inventory, and learning engagement questionnaire.

Flipped Learning Readiness Questionnaire

Flipped learning readiness questionnaire was developed and validated by Hao (2016) and includes 27 items based on a 5-point Likert scale varying from "completely disagree" (1) to "completely agree" (5). The scale included 4 subscales on learner control and self-directed learning, technology self-efficacy, motivation for learning, in-class communication self-efficacy, and doing previews. "The face validity of these items was confirmed by two experts, who compared them to items in Smith's (2005) study" (Hao, 2016, p. 297). The reliability was reported with a sufficient alpha level ranging from .75 to .92

Learner Autonomy Scale

The learner autonomy Scale was devised by Sakai et al. (2008) and it was adopted as such in this study. This scale is used for examining the learners' autonomy. The questionnaire includes 65 items and assesses five dimensions of "Recognition of Responsibility for Learning, Responsibility for Past Learning, Responsibility for Future Learning, Past Learning outside Classroom, and Future Learning outside Classroom.". Responses were given a 5-point Likert scale ranging from (1) 1-Not at all, 2-Hardly, 3-To some extent, 4-Mostly, (5) Totally". This scale has high reliability and validity. The Cronbach's coefficient alphas were bigger than .80.

Critical Thinking Inventory

To measure learners' critical thinking California Critical Thinking Skills Test (CCTST) was used in this study. This test includes 34 multiple-choice questions developed to measure critical thinking using two sub-scales. The primary subscale consists of Analysis, Evaluation, Inference, and the secondary subscale includes Deduction and Induction (Sadeghi, Hassani, & Rahmatkhah, 2014).

Learning Engagement Questionnaire

This questionnaire was developed and validated by Gasmi (2017) which was a modification of three validated instruments (Greene's (2015) Cognitive Engagement Scale, Miserandino's (1996) Perceived Behavioral and Emotional Engagement Questionnaire, & Reeve and Tseng's (2011) students' agentic engagement). This questionnaire has 4 components measuring students' Agentic Engagement, Behavioral Engagement, Cognitive Engagement, and Emotional Engagement. This scale has 67 items. "Each item in the SEQ was measured on a 6-point Likert scale ranging from 'strongly agree' (6) to 'strongly disagree' (1) in Parts I, II, III and IV, and from 'very much' (6) to 'not at all (1) in Part V" (Gasmi, 2017, p. 77). It also showed acceptable internal consistency levels and the Cronbach's coefficient alphas was .86.

Procedure

The present study aims to examine the relationship between Iranian EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy based on quantitative design. The data collection for this study took place in May 2021.

After getting permission from the supervisors and teachers of the English institutions, the researchers distributed the questionnaires online among English language learners. The language of the questionnaires was English. To make sure that students understand the items properly, the Persian translation of the items was sent to them too. Learners completed the scales in two hours. After gathering the questionnaires, the data were analyzed.

Data Analysis

The data were analyzed by the SEM approach of Amos software to find more exact correlations among the variables. The data were also analyzed by SPSS software for Descriptive statistics of variables of the study, Reliability, and Pearson correlation. In addition, the proposed model was tested using the Amos 24 statistical package.

RESULTS

Descriptive statistics of variables of the study (learners' flipped learning readiness, learning engagement, critical thinking, and autonomy), are presented in Table 1.

Table 2 summarizes the information obtained from Cronbach alpha analyses. As can be seen, the utilized questionnaires gained acceptable indices of Cronbach alpha

The alpha coefficient for total Flipped Learning Readiness with 27 items (.89), for total Learning Engagement with 65 items (.91), for total Critical Thinking with 34 items (.73), and total Autonomy with 65 items (.84), suggest that the items have relatively good internal consistency.

Table 1

Descriptive Statistics of the Variables

	N	Min	Max	Mean	SD
Flipped Learning Readiness	520	56	127	103.24	5.45
Learning Engagement	520	189	323	242.18	21.87
Critical Thinking	520	11	32	20.74	2.09
Autonomy	520	177	287	211.56	17.04

Table 2

Results of Cronbach alpha

Scale	Number of Items	Cronbach alpha
Flipped Learning Readiness	27	.89
Learning Engagement	65	.91
Critical Thinking	34	.73
Autonomy	65	.84

Q: Are there any statistically significant relationships between EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy?

To assess Research Question, Pearson correlation was used. Table 3 indicates the results of the correlation between learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy.

Results of correlation revealed that total flipped learning readiness correlated positively and significantly with three variables: learning engagement (r=.46, p=.000), critical thinking (r=.25, p=.000), and autonomy (r=.39, p=.000). Based on this result, flipped learning readiness has the highest correlation with learning engagement and the lowest correlation with critical thinking. In addition, the correlation analysis indicates that while statistically significant, the strength of the correlations is overall quite weak between FLR, CT, AU, and LE.

In addition, the proposed model was tested using the Amos 24 statistical package. To check the strengths of the causal relationships among the components, standardized estimates were examined. Several fit indices were examined to evaluate the model fit. Table 4 shows the goodness of fit indices.

Table 4 shows the chi-square/df ratio (2.55), RMSEA (.07), GFI (.95), NFI (.91), and CFI (.92), all the fit indices lie within the acceptable fit thresholds. Therefore, it can be concluded that the proposed model had a perfect fit with the empirical data.

Figure 1 represents the schematic relationships between EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy.

As indicated in Figure 1, flipped learning is a positive significant predictor of three variables: Critical Thinking (β= .18, p<0.05), Engagement (β= .31, p<0.05), and Autonomy (β= .24, p<0.05). In addition, engagement is positively predicted by both critical thinking (β= .16, p<0.05), and autonomy (β= .22, p<0.05). Finally, results revealed that Critical Thinking is a positive significant predictor of Autonomy (β= .17, p<.05).

DISCUSSION

One of the findings of this study is that there was a positive relationship between flipped instruction and learners' critical thinking. This finding is in line with the finding of Viriyavejakul's (2020) study. He also found that flipped instruction and critical thinking are positively interrelated. In this respect, Green (2015) argued that engaging students in the process of learning such as in flipped learning could develop their critical thinking ability as well as problem-solving skills. Also, the other finding of this study is that flipped learning readiness had the highest correlation with learning engage-

Table 3

Results of Correlation between Variables

		1. FLR	2. LE	3. CT	4. AU
1. Flipped Learning Readiness	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	520			
2. Learning Engagement	Pearson Correlation	.46**	1		
	Sig. (2-tailed)	.000			
	N	520	520		
3. Critical Thinking	Pearson Correlation	.25**	.18*	1	
	Sig. (2-tailed)	.000	.011		
	N	520	520	520	
4. Autonomy	Pearson Correlation	.39**	.35**	.22**	1
	Sig. (2-tailed)	.000	.000	.001	
	N	520	520	520	520

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

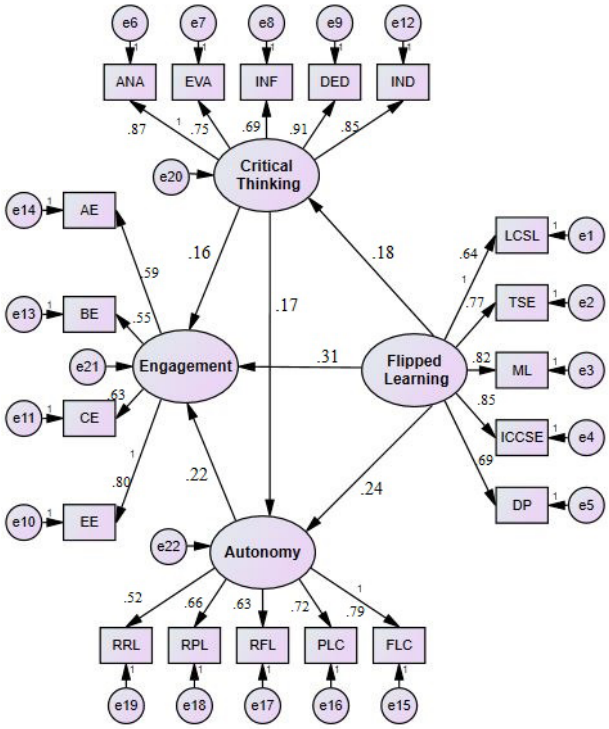
Table 4

The goodness of fit indices

	X2/df	GFI	CFI	NFI	RMSEA
Acceptable fit	<3	>.90	>.90	>.90	<.08
Model	2.55	.95	.92	.91	.07

Figure 1

The schematic relationships among variables



Note. AE: agentic engagement, BE: behavioral engagement, CE: cognitive engagement, EE: emotional engagement, ANA: analysis, EVA: evaluation, INF: inference, DED: deduction, IND: induction, LCSL: learner control and self-directed learning, TSE: technology self-efficacy, ML: motivation for learning, ICCSE: in-class communication self-efficacy, DP: doing previews, RRL: recognition of responsibility for learning, RPL: responsibility for past learning, RFL: responsibility for future learning, PLC: past learning outside the classroom, and FLC: future learning outside the classroom.

ment. The result of this study confirms the results of Gasmi's (2017) research that found that flipped instruction had an impact on EFL learners' engagement in academic writing classes in Oman. This may be because, in flipped learning, students become more actively involved with learning.

In addition, the other finding of this study is that there was a positive relationship between flipped instruction and learners' autonomy. The result of this study is in line with the result of Han (2015) who found that flipped classrooms had a significant effect on ESL learners` autonomy. As flipped learning needs students to be actively engaged in learning, the development of learner autonomy could be achieved. In this form of instruction, because students are not greatly dependent on their teachers in the process of learning and teaching such as in the traditional ones, they get more autonomy. When students are at higher levels on all the flipped learning readiness dimensions, they will be more independent and autonomous. This may be because of "successful online learning experiences leading them to be more familiar with the use of information technology for learning and also with self-directing their learning" (Hao, 2016). Thus, these students are more confident (Ferlazzo, 2015) and autonomous, motivating them more to do previews. Therefore, students who have a better-flipped learning readiness may tend to be more able of and be more motivated to learning engagement, to be autonomous in learning and to do self-directed learning, and have higher opportunities for critical thinking in their process of learning.

Many implications arise from this study. Students are regarded as the first beneficiary of the results. The relationships of readiness levels, learning engagement, critical thinking, and autonomy show that enhancing students' readiness is essential in improving their learning factors. Being taught through flipped instruction, students can develop their learning engagement, critical thinking, and autonomy because they are exposed to an interactive and reflective learning context in which they appear to be more interested to improve their learning opportunities by finding their way of learning. When students are ready for flipped instruction, they can take the required action to solve the probable problems in their learning. Second, teachers need to assure learners of their abilities, competencies and indicate empathy with their learners to develop readiness levels. Technology-based instruction by flipped one can help teachers to achieve their aims by engaging their students in learning, which makes it more enjoyable, interesting, and meaningful for the students. Also, teachers may find it beneficial to instruct on how to take advantage of online learn-

ing resources and to improve their learning experience. In addition, teacher trainers also require developing teacher training programs and workshops to increase the teachers' awareness of teaching and managing their flipped instruction classes.

Finally, the researcher hopes the findings would shed light on more influential instructional design strategies for the design and implementation of the flipped instruction approach according to learners' perspectives. The results of this study also would develop a framework for the instructional designers, teachers, teacher trainers, institute managers, and supervisors to develop and perform flipped instruction according to approved instructional standards and principles.

The significant limitation of this study is that learners' flipped learning readiness, learning engagement, critical thinking, and autonomy were evaluated by the questionnaires. No interviews or open-ended questions were included so that the students could voice their own thoughts. Further studies can do a mixed-method approach and evaluate them by both questionnaires and interviews or open-ended questions. Also, in this study, the researcher examined the relationship between learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy among language institute learners. Further research can examine the role of these variables in public schools and compare them with the results of the present study. Also, this research should be repeated with more learners from different parts of the world and use methods that guarantee a higher level of randomization and at last greater generalizability. Also, other research can be implemented to explore the relationship between learners' flipped learning readiness with other variables such as students' motivation and achievement.

CONCLUSION

As stated before, the present study sought to examine the relationship between Iranian EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy. With this aim, a research question was raised: "Are there any statistically significant relationships between EFL learners' flipped learning readiness and their learning engagement, critical thinking, and autonomy?" To get a clear picture of the yield results, the research question was addressed by examining the proposed model with SEM and using the Pearson correlation coefficient. The results of the research question revealed that total flipped learning readiness correlated positively and significantly with three variables: learning engagement, critical thinking, and autonomy. Based on this result, flipped learning readiness had the highest correlation with learning engagement and the lowest correlation with critical thinking. Also, the proposed model had a perfect fit with the empirical data. According to the findings, flipped learning was a positive significant predictor of three variables: critical thinking, engagement, and autonomy. In addition, engagement was positively predicted by both critical thinking, and autonomy. Finally, results revealed that critical thinking was a positive significant predictor of autonomy.

DECLARATION OF COMPETING INTEREST

None declared.

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