

Instrumental motivation, critical thinking, autonomy and academic achievement of Iranian EFL learners

Hassan Soodmand Afshar

Bu-Ali Sina University, Iran

Ali Rahimi

Bangkok University, Thailand

Masoud Rahimi

Bu-Ali Sina University, Iran

Among the factors influencing learners' learning, instrumental motivation, critical thinking and autonomy are thought to be of crucial importance. The present study, thus, set out to investigate relationships between instrumental motivation, critical thinking, autonomy and academic achievement of Iranian EFL learners. To this end, 100 Iranian learners majoring in English language were selected as the participants in the study. For data collection purposes, the participants filled out two questionnaires; one on instrumental motivation, adapted from Kimura, Nakata and Okumura (2001), Carreira (2004), and Takagi (2003), and factors analysed, and another on autonomy developed by Cotterall (1995; 1999). They then sat the *California Critical Thinking Skills Test (CCTST)* form B. The participants' GPAs were also requested and collected. The results of multiple correlation analyses revealed that autonomy correlated significantly highly with academic achievement, followed by instrumental motivation and critical thinking, which stood at the second and third places respectively. The results of the multiple correlation analyses also revealed that the relationships between critical thinking and autonomy, and instrumental motivation and autonomy were significant, but critical thinking and instrumental motivation did not correlate significantly. The results of multiple regression analyses revealed that among the independent variables of the study, critical thinking was a significantly stronger predictor of academic achievement, with autonomy and instrumental motivation coming second and third respectively. The implications of the study are discussed.

Introduction

A substantial body of research has been conducted to identify the relationship between academic achievement and other areas of education. Critical thinking, instrumental motivation, and autonomy are assumed to be three major components of language learning (Ahmadi, 2011; Dehghani, Mirdoraghi & Pakmehr, 2011; Latifah, Mansor, Ramli, Wardah & Ng, 2011; Zhang, 2012; McCutcheon, Apperson, Hanson & Wynn, 1992; Wong, 2011; Nguyen, 2012; Wang, 2009). These factors have been the object of numerous studies each of which has its own contribution to the field. They are among the most debated issues in modern education, and their importance is increasingly recognised in many other fields.

Literature review

Academic achievement

Academic achievement is one of the most important indicators of learning in most educational systems. Learners with higher academic achievement are more likely to accomplish their educational goals. The importance of academic achievement has always prompted teachers to employ different approaches, methods, techniques, and models to determine and influence learners' learning. Different factors can lead to better academic achievement, some of which are assumed to have a strong relationship with each other and some others a weaker one. Some other factors, though deemed necessary, are actually neutral or detrimental.

A number of research studies conducted have dealt with the academic achievement of language learners. Collier (1992) investigated language-minority students' academic achievement over a period of four or more years. He used the minority-language for instructional purposes (language-minority studies conducted in the United States on two-way bilingual education, late-exit bilingual education, early-exit bilingual education, and programs with no first language support). He found that enhancing the amount of L₁ instructional support for language-minority students improved their academic achievement in L₂, in each succeeding academic year.

Rostami, Hejazi and Lavasani (2011) found that academic achievement in English did not depend on gender, but on other variables such as perception of classroom procedure, achievement goals and perceived instrumentality. Jahanbakhsh (2012) found that sensing-intuitive learning styles had a positive relationship with the academic achievement of students whose major was mathematics. Jahanbakhsh (2012) further revealed that those students with active-reflective learning styles whose majors were speculative science attained greater academic achievement, and indicated that the academic achievement of students majoring in empirical sciences showed significant correlation with both the input dimension (visual-verbal), and the cognitive dimensions (sequential-global) of learning.

Critical thinking

Critical thinking can be defined with regard to two major domains, namely, cognitive skills and affective dispositions. Critical thinking as a cognitive skill is a set of higher-level thinking skills including analysis, inference, deductive and inductive reasoning which are assumed to be taught and transferred. The disposition part is characterised as the propensity and motivation to apply critical thinking, and includes truth seeking, open-mindedness, systematicity, analyticity, maturity, inquisitiveness, and self-confidence (Ennis, 1989; Facione, 2011; McPeck, 1990; Paul, 1987; Yang & Chou, 2008). The framework of the present study is more in line with the former conceptualisation of critical thinking.

A wide range of definitions and descriptions have been proposed for critical thinking. Ghaemi and Taherian (2011) argued that some indicators of an individual who thinks critically include asking appropriate questions, collecting relevant information, and coming

to reliable conclusions by logical reasoning. Wang (2009) defined critical thinking ability as the ability to think reasonably and reflectively. He further suggests that critical thinking is an ability that allows students to freely express their own ideas, to demonstrate the interrelationships among their ideas, and to generate higher levels of thinking. Paul and Elder (2004) regarded critical thinking as disciplined, self-directed, self-corrective, and self-monitored mode of thinking. They defined critical thinking in terms of skills, intellectual standards, elements of reasoning, and intellectual traits. Davidson (1998) defined critical thinking as a judgment that causes a person to interpret, analyse, evaluate, infer, and explain the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. Barzdžiukienė, Urbonienė and Klimovienė (2006) suggested that one who thinks critically can function effectively in the changing world of the 21st century. Güven and Kürüm (2007) proposed that good learners should know how to learn and how to think. They claim that effective learning is concerned with learners' awareness about how to learn, and effective thinking is related to their awareness about how to think, in other words, critical thinking.

The findings of a number of studies suggest that students who think critically are more curious and ask more questions and when they get the answers, they do not accept it easily. They analyse the received information logically, and come to trustworthy conclusions about the world that enables them to live and act successfully. Wang (2009) showed that students who took part in critical thinking English conversation classes were more likely to attain significantly better critical thinking skills. He further suggested that after applying the learning system in classes which included critical thinking abilities, students in the experimental group attained a greater level of satisfaction with their class. They were satisfied with the instructional objectives, materials, and methods; they were also satisfied with the teacher's characteristics, and the conditions of the class.

Dehghani et al (2011) conducted a study to investigate the role of graduate students' achievement goals in their disposition towards critical thinking. For data collection purposes, they used Midgley, Arunkumar and Urdans' (1996) *Goal Orientations Questionnaire* and *Critical Thinking Dispositions Questionnaire*. They found that there was significant relationship between students' achievement goals and their critical thinking disposition. They further suggested that students' critical thinking disposition could be predicted from their achievement goals. Yang and Wu (2012) revealed that digital storytelling could promote academic achievement, critical thinking, and motivation of senior high school students learning English as a foreign language.

McCutcheon et al. (1992) conducted a study to determine the relationship among critical thinking skills, academic achievement, and misconceptions about psychology. They used two groups of 60 students. In one of the groups there were high academic achievers and in another one there were average academic achievers. For misconceptions about psychology, the participants were given the *McCutcheon Test of Misconceptions*, for critical thinking, they were given the *Watson-Glaser Critical Thinking Appraisal*, and for academic achievement their previous term's GPAs were collected and regarded as an indicator of academic achievement. They found that even the students with high grades and good critical thinking skills were likely to have many misconceptions about psychology.

O'Hare and McGuinness (2009) conducted a study to measure how critical thinking of Irish students changed by the passage of time. It was provisionally concluded that critical thinking changed over the course of a degree and that these abilities were not well captured by traditional academic assessments. Soodmand Afshar and Rahimi (2014) investigated the relationship among critical thinking, emotional intelligence, and speaking ability of Iranian EFL learners. They found emotional intelligence followed by critical thinking, significantly correlated with and predicted speaking ability of Iranian EFL learners.

In an experimental study, Hashemi and Ghanzadeh (2012) investigated the impact of critical discourse analysis (CDA) on TEFL students' critical thinking ability. They administered the *Watson Glaser Critical Thinking Appraisal Form A* for both pre-test and post-test over the two groups. The experimental group was instructed to critically analyse teacher-distributed articles and devised follow-up presentations based on CDA. The findings revealed that CDA had a positive and significant impact on learners' critical thinking ability.

Fahim and Nasrollahi-Mouziraji (2013), investigating the relationship between self-efficacy and critical thinking ability of 50 Iranian university students majoring in English teaching, found a strong relationship between Iranian university students' critical thinking ability and their self-efficacy.

Instrumental motivation

One of the factors in teaching English as a foreign language is to inform learners of the benefits they can obtain from learning English. According to some experts, instrumental motivation plays a crucial role in second or foreign language learning (Ahmadi, 2011; Latifah et al., 2011; Zhang, 2012; Wong, 2011). There are some learners who tend to learn the English language to pursue their career aspirations, read general or technical texts, translate, and so on. In other words, they are instrumentally motivated to obtain something for such utilitarian purposes as financial gains, academic achievement, job promotion, etc. In the field of language learning, for instance, learners with instrumental motivation may want to learn the language in order to enter college, score high in international English proficiency exams like IELTS, TOEFL, etc., get a job, or gain public recognition at school, college or society. After they achieve their goal, they stop studying English. That is, to them studying English is only a means to an end (Brown, 2000).

Wong (2011) investigated the effects of both instrumental and integrative motivation on third-year Chinese undergraduates in learning ESL, and sought to find the type of motivation which played a more important role in their second language learning process. He found that instrumental motivation was more important among these students in learning a second language, as compared to its counterpart (i.e. integrative motivation).

Latifah et al. (2011), investigating the relationship between motivation, anxiety and instrumental orientation on the performance of English as a second language, indicated that all the four variables were significantly correlated with learners' performance in

English at Open University in Malaysia. They also found that all the variables except personal motivation exerted significant impact on performance, with anxiety having a negative impact, while attitude and instrumental orientation having a positive impact.

Ahmadi (2011) investigated the effect of integrative and instrumental motivation on Iranian EFL learners' language learning. He considered gender as a moderator variable. He used Gardner and Lambert's (1959) integrative and instrumental motivation model in order to achieve the results. He found that female students had stronger integrative motivation, but male students had a stronger instrumental motivation than integrative motivation.

Autonomy

According to some studies, the way to foster autonomy in learners might be based on providing opportunities to make decisions concerning the management of their own learning (Nguyen, 2012). Learners who are autonomous show a higher level of interest in their language learning. According to some scholars, a change in focus on language instruction from teacher-centred to learner-centred approaches gives learners the ability to take greater responsibility for their own language learning, making them more autonomous (Nguyen, 2012).

Learners are encouraged to learn how to learn and learn how to use a foreign language, so that they are enabled to diagnose some of their own learning strengths and weaknesses. Dang (2012) suggested that, as far as learner autonomy relates to social issues, a combination of socio-cultural theory and community of practice is recommended for any investigation into this construct. He also suggested that in order to foster autonomy in learners, there should be a contribution of personal and contextual aspects.

Learner autonomy as a new field of study has gradually come into existence since the 1970s, as a consequence of a new shift in interest in studies on language learning. Learners have gradually become viewed as producers of language, and less as learners of a system imposed on them by society.

Bocanegra and Haidl (1999) found that learner autonomy was associated with a fundamental construct, namely, responsibility. They revealed that learners, in order to be responsible for their learning, should make decisions, face their consequences, and manage their life. They elucidated that such responsibility was not an inborn characteristic of human beings, but the result of an experience that they gained after accomplishing a process. Little (2007) saw learner autonomy as the use of the target language for reflective purposes, because it played an essential role in developing learners' capacity for L₂ inner speech.

Nguyen (2012) indicated that learner autonomy was an increasingly important aspect of higher education because it met the purposes of developing lifelong, autonomous learners. He further suggested that teachers had a crucial role in fostering learner autonomy in language learning. That is, because of the interdependence between teachers and students,

teachers could make learners responsible for their own learning. Similarly, Hashemian and Soureshjani (2011), investigating the relationship among autonomy, motivation, and academic performance of 60 Persian L2 learners, found significant relationships between autonomy and academic performance on the one hand, and between motivation and academic performance on the other. However, they found no significant relationship between motivation and autonomy.

Also, Negari and Solaymani (2013) investigated the relationship among attitudes to autonomous learning, thinking styles, and language learning strategy use of 92 Iranian EFL learners. Their findings revealed there was a significant relationship between self-attitude to autonomy and all the subcategories of strategy use. Furthermore, they found there was a significant relationship between self-attitude to autonomy and most of the subcategories of thinking styles (i.e. legislative, judicial, hierarchic, global, local, internal, external and liberal).

To sum up, it could be argued that as the review of the literature revealed, there seems to be a positive relationship between critical thinking, instrumental motivation, autonomy, and academic achievement, but the relationship of all the first three variables taken together on academic achievement remains unclear. Furthermore, how far the dependent variable (i.e. academic achievement) is reliant on each independent variable (i.e. critical thinking, instrumental motivation, and autonomy) needs to be investigated.

Statement of the problem and research questions of the study

As stated earlier, academic achievement in a foreign language is said to be enhanced by developing critical thinking, instrumental motivation, and autonomy in learners (Ahmadi, 2011; Deghani, Mirdoraghi & Pakmehr, 2011; Latifah, Mansor, Ramli, Wardah & Ng, 2011; Zhang, 2012; McCutcheon, Apperson, Hanson & Wynn, 1992; Wong, 2011; Nguyen, 2012; Wang, 2009). Although the literature of the field contains numerous studies conducted on the relationship among critical thinking, instrumental motivation, autonomy and EFL learning, no study could be found which in an Iranian context examined the combined relationship of these three variables with, and their prediction of, EFL learners' academic achievement. Therefore, to fill this gap in the research, the following research questions were postulated:

1. Is there any statistically significant relationship among Iranian EFL learners' critical thinking, instrumental motivation, autonomy and their academic achievement?
2. Among critical thinking, instrumental motivation, and autonomy, which one is a significantly stronger predictor of Iranian EFL learners' academic achievement?

Method

Participants

One hundred undergraduate students majoring in English language were chosen as the participants in the study. Fifty of these students were majoring in English language at Bu-Ali Sina University, Hamedan, while the other 50 were undergraduate students majoring in

English language at Azad University in Sanandaj. They took part in the study during the academic year of 2012-2013. The participants were almost all at the same proficiency level (i.e. they were all juniors and seniors) who were selected by convenience sampling. Participants' ages varied, but all of them were adult EFL learners above 19 with the mean age being nearly 23.5. Gender was not considered as a moderator variable.

With regard to the familiarity of the participants with the constructs under investigation in the study (i.e. critical thinking, instrumental motivation, and autonomy), it must be mentioned that since the educational system in Iran at both school level and BA/BS level at university is mainly memorisation-based and teacher-centred (Dahmardeh, 2006; Soodmand Afshar & Movassagh, 2014). Thus, the participants of the study were not, naturally speaking, particularly familiar with and aware of such concepts as critical thinking and autonomy. However, some might have, to some extent, been familiar with the practical advantages that studying English as a foreign language might afford them (i.e. instrumental motivation).

Materials and instruments

The instruments adopted in the present study included *The California Critical Thinking Skills Test Form B*, and *Instrumental Motivation Questionnaire* adapted from Kimura et al (2001), Carreira (2004), and Takagi (2003), and *Learner Autonomy Questionnaire* developed by Cotterall (1995; 1999). The details of these three instruments are presented next.

1. The critical thinking test was labelled *The California Critical Thinking Skills Test Form B*, developed by Facione and Facione (1993). It contains 34 multiple choice questions, each with one correct answer. The critical thinking test includes five areas of evaluation, inference, analysis, inductive reasoning and deductive reasoning. In order for all participants (i.e. both good and poor learners) to better and more easily understand the questionnaire, it was translated into Persian and was edited by Persian and English language experts and was back translated to ensure the validity of the translation. The participants were given enough time to choose the options they thought were the correct answers. The total marks ranged from 1 to 34, hence each question received one mark. Khalili and Hossein Zadeh (2003) found this test and its subscales enjoyed acceptable reliability (calculated through KR-20), validity (measured through factor analysis and KMO and Bartlett's Test of Sphericity), and normality indices in Iranian context.
2. The *Instrumental Motivation Questionnaire* was a Likert scale questionnaire containing 15 items. For each item there were five options for the participants to choose, based on their own points of view. It was adapted from Kimura et al (2001), Carreira (2004), and Takagi (2003). Options were arranged from strongly agree to strongly disagree. The internal consistency of the questionnaire in the present study was calculated using Cronbach's alpha which came to be 0.71. The questionnaire and its subscales also enjoyed acceptable validity (measured through factor analysis, KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity).

3. The *Learner Autonomy Questionnaire* was originally developed by Cotterall (1995; 1999) which was already factor analysed and validated by Soodmand Afshar and Bastami (2012) in the Iranian context. It was also a Likert scale questionnaire. There were 40 items, each one containing four or five options to choose from based on the participants' points of view.

Procedures

The test and the questionnaires were administered to the learners in three different sessions. The questions and procedures for filling out the questionnaires and the CCTST were elucidated for the participants. The participants were requested to write down their names on all instruments which they were assured would be kept confidential. Before answering the questions, the participants had time to look through the items in order to become acquainted with the forms and types of the questions. One of the researchers were present at the time of administering the questionnaires to resolve any likely ambiguities. The participants circled the answers they thought were right for the CCTST, and the answers they deemed appropriate (for Instrumental Motivation and Autonomy Questionnaires). The CCTST administration took approximately 45 minutes, the instrumental motivation questionnaire took twenty minutes, and the autonomy questionnaire took 30 minutes. The participants' GPAs were also requested and collected and were regarded as an indicator of academic achievement.

Data analysis

Multiple correlations were run to investigate the relationship among the variables of the study (i.e. to answer the first question). The participants' critical thinking, instrumental motivation, autonomy, and GPA (i.e. academic achievement) were correlated with each other. To find out which independent variable (i.e. critical thinking, instrumental motivation, and autonomy) was a stronger predictor of the participants' academic achievement, multiple regression analysis was applied.

Results

First, the descriptive statistics (i.e. means and standard deviations) of participants' responses to CCTST, instrumental motivation questionnaire, autonomy questionnaire, and academic achievement were calculated (Table 1).

The first research question set out to investigate whether there was any significant relationship among critical thinking, instrumental motivation, autonomy and academic achievement of Iranian EFL learners. Multiple correlations were run to answer this question, the results of which are presented in Table 2. As the results in Table 2 show, critical thinking, autonomy and academic achievement were significantly correlated. Furthermore, the results show that instrumental motivation did not significantly correlate with critical thinking, but it had significant correlation with academic achievement.

Table 1: Descriptive statistics of participants' responses to CCTST, instrumental motivation, and autonomy questionnaires, and their marks in academic achievement

	N	Minimum	Maximum	Mean	Std. deviation
Critical thinking	100	.09	.41	.2573	.07202
Instrumental motivation	100	2.27	4.80	3.8512	.51803
Autonomy	100	2.05	3.95	3.1908	.37540
Academic achievement	100	13.00	19.12	16.0466	1.49313
Valid N (listwise)	100				

Table 2: Multiple correlation investigating the relationship among critical thinking, instrumental motivation, autonomy and academic achievement

		Academic achievement	Instrumental motivation	Autonomy	Critical thinking
Academic achievement	Pearson correlation	1	.395	.417	.365
	Sig. (2-tailed)		.000	.000	.000
	N	100	100	100	100
Instrumental motivation	Pearson correlation	.395	1	.448	.158
	Sig. (2-tailed)	.000		.000	.115
	N	100	100	100	100
Autonomy	Pearson correlation	.417	.448	1	.214
	Sig. (2-tailed)	.000	.000		.032
	N	100	100	100	100
Critical thinking	Pearson correlation	.365	.158	.214	1
	Sig. (2-tailed)	.000	.115	.032	
	N	100	100	100	100

The second research question set out to examine, among critical thinking, instrumental motivation and autonomy, which one was a significantly stronger predictor of the participants' academic achievement. To this end, a multiple regression analysis was conducted, as summarised in Tables 3, 4 and 5.

First, Table 3 shows the multiple correlation coefficient, and the adjusted and unadjusted correlation of critical thinking, instrumental motivation, and autonomy with academic achievement.

Table 3: Model summary investigating the multiple correlation coefficient, the adjusted, and unadjusted R of critical thinking, instrumental motivation, autonomy with academic achievement

Model	R	R square	Adjusted R square	Std. error of the estimate	Durbin-Watson
1	.547	.299	.277	1.26974	1.878

As the results in Table 3 indicate, the multiple correlation coefficient (R), using all predictors (i.e. critical thinking, instrumental motivation, and autonomy) simultaneously, is 0.55 ($R^2 = 0.30$) and the adjusted R squared is 0.28. It indicates that 28% of the variance in

learners' academic achievement can be predicted from the combination of critical thinking, instrumental motivation, and autonomy.

Next, ANOVA was run to investigate whether the combination of the predictors (i.e. critical thinking, instrumental motivation, and autonomy) significantly predicted Iranian EFL learners' academic achievement, the results of which are summarised in Table 4.

Table 4: ANOVA Investigating the prediction of the combination of critical thinking, instrumental motivation, and autonomy of academic achievement

	Sum of squares	df	Mean square	F	Sig.
Regression	65.939	3	21.980	13.633	.000
Residual	154.774	96	1.612		
Total	220.714	99			

As shown in Table 4, the combination of critical thinking, instrumental motivation, and autonomy predicted academic achievement of the participants, $F(3, 96) = 13.63$, $p = .000 < .05$. Table 5 shows the amount of contribution of each of the independent variables (critical thinking, instrumental motivation, and autonomy) to the dependent one (academic achievement).

Table 5: Multiple regressions investigating the predictive power of critical thinking, instrumental motivation, and autonomy of academic achievement

	Unstandardised coefficients		Standardised coefficients	t	Sig.
	B	Std. error	beta		
(Constant)	8.746	1.224		7.147	.000
Instrumental motivation	.691	.276	.240	2.502	.014
Autonomy	.998	.385	.251	2.590	.011
Critical thinking	5.655	1.819	.273	3.110	.002

As the results in Table 5 indicate, among critical thinking, instrumental motivation, and autonomy, the former was stronger predictor of academic achievement of the participants, (beta = .27, $t = 3.1$, $p = .002 < .05$). Autonomy stood at the second place, (beta = .25, $t = 2.6$, $p = .011 < .05$), and instrumental motivation was at the third place, (beta = .24, $t = 2.5$, $p = .014 < .05$).

Discussion

The present study addressed the relationship among critical thinking, instrumental motivation, autonomy, and academic achievement of Iranian EFL learners. The results suggested positive relationships among the independent variables (i.e. critical thinking, instrumental motivation, and autonomy) and the dependent variable (i.e. academic achievement). The results also revealed significant and insignificant relationships among the independent variables. The results further proposed that critical thinking was a significantly stronger predictor of Iranian EFL learners' academic achievement.

Investigations of how learners' critical thinking relates to their academic achievement are rare. However, the present study addressing this issue, found that the learners who received a high score in the CCTST had a high GPA, and those who received a low score had a low GPA. As a result, it can be stated that critical thinking might significantly predict academic achievement. The findings of the study in this regard seem to be in line with those of Barzdžiukienė et al. (2006) who found that learners who were taught how to think critically were better language learners. Also the findings are thought to be in line with those of Dehghani et al. (2011), who suggested a significant relationship between learners' achievement goals and their critical thinking. The findings, however, are not in line with those of Emir (2009) who revealed that academic success did not have a meaningful relationship with critical thinking.

Halvorsen (2005) claimed that, to think critically about an issue is to consider different perspectives of that issue. He further suggested that learners should be provided with opportunities to look at and challenge any possible assumptions that may underlie the issue, and to explore its possible alternatives. Traditional methods of teaching English did not allow learners to challenge learning directives. That is, the learners were not given the opportunities to ask questions or to contribute to the classroom discourse. Nowadays, modern methods of learning and teaching should be based on developing and encouraging critical thinking in language learners. In order to make learning meaningful, learners should be encouraged not to accept things easily. They should be encouraged to relate and compare new events or items to ones known and be doubtful about them. As a result, they can ask many questions and challenge the new learning items until the message is completely illuminated for them, and also until they are satisfied.

Critical thinking is important and applicable to so many areas of life and learning. It has been said that when people are not able to think critically and intelligently about the myriad of issues and problems that confront them, they then may come across many answers, and still do not know what the answers mean (Halpern, 1998). Walker (2003) suggests that in order to promote critical thinking in learners, teachers should teach them some strategies. He claims that learners should be encouraged to be inquisitive, ask questions, and not believe and accept everything they are told. Two other strategies suggested by Walker (2003) are classroom discussion and debates and written assignments. He further claims that thinking develops with practice and evaluation over time by using multiple strategies.

Critical thinking also seems to play a role in language teaching and learning. Williams and Burden (1997) claim that learners need to use their minds to observe, think, categorise and hypothesise in order to work out how a language operates.

It was also found in the present study that the learners who received a high score in instrumental motivation had a high GPA; those who received a low score, had a low GPA. The findings of the study in this regard seem to be in line with those of Latifah et al. (2011) who found that instrumental motivation significantly correlated with learners' performance in the English courses. It was suggested that instrumental motivation played an important role in academic achievement of EFL learners.

The findings of the study also align with those of a study conducted by Wong (2011) who found that instrumental motivation was more significant in learning a second language than the learners' integrative motivation. Therefore, almost all EFL learners might be assumed to have some kind of instrumental motivation. They might choose English as their major for academic reasons, getting a job, going abroad, making financial benefits, etc. That is why that the number of EFL learners who choose English as a useful instrument is increasingly becoming high.

The relationship between autonomy and academic achievement was also investigated in the present study. It was found that the learners who received a high score in the autonomy questionnaire, had a high GPA, and those who received a low score, had a low GPA. Corroborating our findings, Hashemian and Soureshjani (2011) also found a significant relationship between autonomy and academic performance. The findings of this study also seem to be harmonious with those of Little (2007) who suggests that learner autonomy be seen as a successful way of better and successful learning. The findings here are also in line with the results of Guay, Ratelle, Larose, Vallerand, and Vitaro (2013) who found that the learners who are autonomous, show better academic achievement.

However, as the findings of Ming and Alias (2007) indicate, a considerable number of learners in the world in general and in Iran in particular, in reality, prefer a teacher-centred approach to learning and show lack of autonomy in their learning of English as a foreign language, most probably because they see the teacher as the authority and a very versatile person in the class. There is also a minority of learners who tend to become autonomous. That is, they desire the freedom and responsibility to decide what, where, when, and how to learn. They seemingly employ their own learning styles and strategies, and are independent from their teachers. Learners who take charge of their own learning might highly feel autonomous from their teachers and are apparently more able to diagnose their weaknesses and by applying their own strategies and styles they can consequently improve them.

Opportunities should thus be provided for learners to become more responsible for their learning. Teachers can do so by providing an atmosphere in which the learners could correct their own mistakes (i.e. through self-correction, peer-correction, etc.) and guide and motivate themselves. In order to promote autonomy in learners, Cotteral (1995) considers the role of six important variables as essential. They include the teacher, feedback, the learners' sense of self-efficacy, learning strategies, dimensions of strategy-related behaviour and the nature of language learning. Similarly, Bocanegra and Haidl (1999) propose that in order to make the learners responsible for their learning, teachers should teach them to make decisions, face their consequences, and manage their lives.

The present study also investigated the relationship between critical thinking and instrumental motivation on the one hand and between instrumental motivation and autonomy on the other. It was found that critical thinking and instrumental motivation were not significantly correlated. Since there is paucity of research in the literature of the field investigating this relationship, the need for the conduct of more research in this

regard becomes more evident. However, in the present study, instrumental motivation was found to have significantly correlated with autonomy, a finding which contradicts the results of Hashemian and Soureshjani (2011) who found no significant relationship between motivation and autonomy.

Attempts were also made in the present study to investigate the relationship between critical thinking and autonomy. It was found that the learners who received a high score in the autonomy questionnaire, also gained a high score in their CCTST, and those who received a low score in the autonomy questionnaire, gained a low score in the CCTST too. Such findings seem to be harmonious with the results of Fahim and Behdani (2011) who found that autonomy significantly correlated with the critical thinking abilities of Iranian learners. Similarly, Paul and Elder (2013) indicated that autonomous learners were independent of others for the direction and control of their thinking. They further claimed that these learners typically adhered firmly to their beliefs, values, and ways of thinking. That is, autonomous learners seem to reflect, decide, and act critically and independently and might mindfully form principles of thought and action.

The second research question of the study sought to investigate the extent to which the Iranian EFL learners' academic achievement could be accounted for by their critical thinking, instrumental motivation and autonomy. It was found that all the three variables to some extent predicted academic achievement. It was further found that critical thinking was the strongest predictor of academic achievement.

This finding sheds more light on the important role such higher order thinking skills as analysis, inference, argumentation, inductive and deductive reasoning can play in mastering a foreign language.

Conclusion and implications of the study

The study set out to investigate the relationship among critical thinking, instrumental motivation, autonomy and academic achievement of Iranian EFL learners. The findings revealed a positive relationship among the independent variables of the study and academic achievement of the learners. The results of the study also indicated there was no significant relationship between critical thinking and instrumental motivation; however, instrumental motivation and autonomy were significantly correlated. Furthermore, the findings revealed among the independent variables of the study, critical thinking was a significantly stronger predictor of Iranian EFL learners' academic achievement.

The implications of the study are threefold. First, it suggests that course designers and materials writers incorporate in their courses and contents, materials that stimulate learners' thinking processes and encourage learner autonomy and learner-centeredness. EFL teachers are also recommended to train their learners in thinking critically and analytically (e.g., by asking them and encouraging them to ask challenging and inferential questions). Secondly, teachers should gradually remove themselves from the centre of attention, encouraging learners to take more responsibility for their own learning. Thirdly, teachers should make learners conscious of the advantages that learning a foreign language

like English could bring to them. The findings may benefit EFL learners in that they could seek opportunities to enhance their higher-order thinking skills (i.e. critical thinking), depend more on their own abilities in learning, and motivate themselves by thinking of the practical benefits of learning a foreign language.

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Dr Hassan Soodmand Afshar (corresponding author) is an Assistant Professor in TEFL teaching MA and PhD courses at Bu-Ali Sina University, Hamedan, Iran. He is also Cambridge ESOL Centre Exams Manager of IR056 (Hamedan Marefat Language Institute, a Cambridge Open Centre). He is the author of some books and various articles in TEFL and has presented extensively both in and outside the country. His research interests include vocabulary learning strategies, critical thinking, autonomy and emotional intelligence, oral language assessment, ESP and teacher education.

Email: soodmand@basu.ac.ir, hassansoodmand@gmail.com

Dr Ali Rahimi is an Associate Professor of Applied Linguistics at Bangkok University, Thailand. He has presented extensively in international conferences and published in international journals. His main research interests include critical discourse analysis, materials evaluation, identity and language.

Email: ali.r@bu.ac.th, rahimijah@yahoo.com

Masoud Rahimi is an MA graduate of Teaching English as a Foreign Language (TEFL) from Bu-Ali Sina University, Hamedan, Iran. His main research interests include critical thinking, emotional intelligence, autonomy, and speaking ability studies.

Email: rahimimasoud87@gmail.com

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