

Multiple Intelligences as Predictors of Resource Management and Motivational Self-Regulated Learning

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ABSTRACT: *The present study aimed to investigate the relationship between multiple intelligences and self-regulated learning components of Iranian EFL university students majoring in Teaching English and English Translation. To this end, a sample of 150 intermediate level students from Imam Khomeini International University in Qazvin and Islamic Azad University in Takestan were selected. Data were gathered by means of questionnaires and were analyzed using stepwise multiple regression procedures. Results indicated that there were significant relationships between multiple intelligences and resource management self-regulated learning. However, the relationship between multiple intelligences and the motivational self-regulated learning was not statistically significant.*

Keywords: *Multiple Intelligences, Self- Regulation, Resource Management Self-Regulation, Motivational Self-Regulation*

ORIGINAL ARTICLE

INTRODUCTION

Howard Gardner developed his theory of MI and published his book "Frames of Mind" in 1983. MI theory provides new conditions for schools and institutions to design their curriculum. In the past two decades, MI theory has been the center of heated debate in language learning. MI theory provides new insights in educational settings. All humans possess varying amounts of intelligences that are located in different areas of the brain (Gardner, 1999).

The emergence of the term self-regulated learning or SRL is due to the increased focus on self-regulation in academic contexts in the 1980s and the gained prominence in the 1990s (Dinsmore et al., 2008). Educational researchers have recently begun to study the processes through which learners self-regulate their own academic learning. Psychology emerged as a science in the early years of the 20th century, and the notion of individual differences in educational curriculum attracted researchers to this issue (Zimmerman, 2002).

Multiple intelligences and the components of self-regulated learning have become a significant subject in educational psychology and academic curriculum design. Since there are few studies done before in Iran to investigate this relationship, there seems to be a need for future research on this topic. Several previous studies have investigated various aspects of multiple intelligences and self-regulated learning. However, few studies, if any, have focused on the relationships between multiple intelligences and resource management and motivational self-regulation. The present study aims to fill part of this gap. It attempts to answer the following research questions:

1. Which type of multiple intelligences is a better predictor of resource management self-regulated learning?
2. Which type of multiple intelligences is a better predictor of motivational self-regulated learning?

LITERATURE REVIEW

Multiple Intelligences

The story of intelligence starts with Alfred Binet and a group of colleagues whose research were conducted at the end of the 19th century and the beginning of the 20th century when psychological studies moved from prescientific understanding to empirical investigations. Binet and his colleagues believed that intelligence was measurable; so they provided a series of questions that could be administered and scored quickly (Akbari and Hosseini, 2008; Armstrong, 2009; Denig, 2004). Gardner (1999) redefines intelligence as a "bio-psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture".

Multiple intelligences theory can have applications in education and can develop language teaching and learning. Gardner and Hatch (1989) assert that linguistic and logical intelligences are of more concern in traditional education systems. In 1999, Gardner made a distinction between traditional education systems and MI theory application. MI theory emphasizes that all intelligences should be taken into account productively in



society and teachers should focus on all intelligence types as equally important. Moreover, Christison (1998) states that MI theory helps teachers and educators to put it together in different ways and apply it in their lesson planning and curriculum development, which allows them to understand the diversity in students and offers a framework to examine the teaching techniques and strategies with respect to the learners' differences.

A number of studies have investigated the effects of MI on various aspects of language learning. Cluck and Hess (2003) found that the incorporation of MI helps students to improve their assignment completion, class participation, and engagement. Moreover, the implementation of MI and cooperative learning improved students' motivation.

Razmjoo (2008) conducted a study to determine the relationship between MI and language proficiency of Iranian EFL PhD candidates. The results showed no significant relationship between the two variables.

Abdulkader et al. (2009) sought to find the effect of the application of the MI program on reading comprehension and word recognition in 5th- year learners with learning disabilities. They found that MI program was effective in improving the reading comprehension and word recognition skills.

Alghazo et al. (2009) investigated the types of multiple intelligences in the social studies, Arabic and English books. The results showed that the visual intelligence was the most common kind of intelligence in all three books and physical intelligence was the least common type of intelligence in the social studies and English books, and the environmental intelligence was the least common kind both in English and Arabic books.

Saricaoglu and Arikan (2009) investigated the relationship between particular intelligence types and students' success in foreign language skills. The results showed a positive relationship between musical intelligence and writing, but a negative relationship between bodily-kinesthetic, spatial, and intrapersonal intelligences and grammar. In a similar study, Eng and Mustapha (2010) investigated how multiple intelligences can be used to improve the writing ability of students. They reported significant improvement in the overall writing ability of students.

Yenic and Aktamis (2010) aimed to determine the multiple intelligences domains and learning styles of the 1st grade (who had not taken the teacher training education yet) and 4th grade (who were at the final finishing stage of the education faculty) teacher candidates. The findings indicated that logical intelligence domain was developed at both 1st grade and 4th grade, but visual-spatial intelligence and instinctive domain were developed only at 1st grade.

In still another study, Ahmadian and Hosseini (2012) reported a statistically significant relationship between participants' MI and their performance on writing. They also showed that linguistic intelligence was the best predictor of writing performance.

Sarani et al. (2012) attempted to investigate the relationship between students' multiple intelligences and their narrative writing performances including: content, coherence, vocabulary, language use, and mechanics. They reached the conclusion that the only positive relationship was between mechanics of writing performance and verbal intelligence.

Self-Regulated Learning

Since the 1960s, there has been a shift from behaviorism to cognitivism in educational psychology. Learners are perceived as active beings who are responsible for their own learning rather than passive ones (Schraw et al., 2006). Pintrich (1999) defines self-regulated learning as those that students apply to monitor and regulate their cognitive, metacognitive, and resource management strategies to control their learning process. Besides, Boekaerts (1999) defines self-regulation as being able to promote knowledge, skills, and attitudes which can be conveyed from one learning context and situation to another.

Zimmerman (2002) states that every student should possess the self-awareness and strategic knowledge to select correct actions when they do not understand some aspects of a lesson. If it were possible for teachers to accommodate every student's limitations, it would damage corrupt students' capability to self-regulate.

Zimmerman (2002) organizes self-regulated processes under three 'cyclical phases' including 'forethought phase', 'performance phase', and 'self-reflection phase'. The 'forethought phase', or 'proactive phase', refers to the beliefs and processes that occur before learners' effort to learn; it involves two main sections: 'task analysis' and 'self-motivation'. The 'performance phase' consists of two sub-phases sections: 'self-control' and 'self-observation. The 'self-reflection phase' consists of two major categories: 'self-judgment' and 'self-evaluation'. This self-regulated process is cyclical because the subsequent phase can be influenced by the prior phase.

Pintrich and De Groot (1990) state that self-regulated learning involves three major components: a) cognitive strategies, b) metacognitive strategies, and c) students' management and control of their effort on academic tasks.

Bandura (1993) and Pintrich (2000) believe that cognitive and meta-cognitive self-regulated learning strategies are not enough to enhance students' learning and academic performance; students must also be motivated to use their motivational strategies to build upon their own understanding of the material. Schraw, et al. (2006) declare that the motivation component consists of two important subcomponents, consisting of self-efficacy and epistemological beliefs. Bandura (1993) and Pintrich (2000) believe that motivational beliefs consist of three general types: a) self-efficacy beliefs, b) task value beliefs, and c) goal orientation. In the present study, we have focused on goal orientation.



According to Pintrich (2000), the term 'goal-orientation' is based on the notion that "achievement goals are not just simple target goals or more general goals, but represent a general orientation to the task that includes a number of related beliefs about purposes, competence, success, ability, effort, errors, and standards". He continues that achievement goals orientation is a constructs that clarify the purpose or reason for which students persisting in an achievement task.

Characteristics of self-regulated learners, according to Zimmerman (1990), are identified by whether 1) they are aware of the strategic relations between regulatory processes or responses and learning outcomes, and 2) they apply these strategies to achieve their academic goals.

Moreover, Chen (2002) believes that if students become aware of their learning strategies and select appropriate one, they can become better learners. The two components of self-regulated learning, namely; resource management and goal orientation achievement are the main concern of this study.

A number of studies have been conducted on various aspects of self-regulated learning. Pintrich (1999) studied the relationship between motivation and self-regulated learning. The findings revealed that positive self-efficacy and task value beliefs can promote self-regulated learning. The adoption of mastery and relative ability goals turned out to facilitate self-regulated learning, whereas the adoption of extrinsic goals hindered self-regulated learning.

Mousoulides and Philippou (2005) found that self-efficacy was a positive predictor of mathematics achievement, whereas self-regulation strategies were a negative predictor of mathematics achievement. They also found that task value beliefs were a positive predictor of self-regulation strategies, but mastery and extrinsic goal orientation were negative predictors of self-regulated strategies.

Mirhassani et al. (2007) examined the relationship between Iranian EFL learners' goal-orientation and self-regulated learning and their language proficiency. The result indicated that there was a significant relationship between goal-oriented learning and language proficiency. Moreover, there was a significant relationship between self-regulated learning and language proficiency.

Amini (2008) studied the relationship between self-regulatory learning strategies and motivational beliefs with academic progress of students. The result revealed that self-regulatory learning strategies were correlated with academic progress, and that all components of self-regulation could predict learning progress.

Kitsantas et al. (2009) investigated the role of self-regulated learning strategies and goal orientation in predicting academic achievement. The results revealed that goal orientation and self-regulated strategies significantly predicted students' achievement. In another study, Al khatib (2010) concluded that intrinsic goal orientation, self-efficacy, test anxiety, and metacognitive self-regulated learning were the positive predictors of students' performance, whereas extrinsic goal orientation, task value, and control beliefs did not predict students' performance.

Aghajani et al. (2012) investigated the relationship between self-directed learning and self-directed evaluation among Iranian students. The results indicated that there was a significant correlation between self-directed learning of students and their self-directed evaluation in academic departments.

To conclude, although there are a number of studies exploring the relationship between MI and language strategies and learning styles, there seems to be a gap in the relationship between MI and self-regulated learning components. To fill part of this gap, this study aims to investigate the types of MI as predictors of resource management and motivational self-regulated learning components.

METHODS

Participants

In the present study, a sample of 150 intermediate level college students (male and female) majoring in TEFL at Imam Khomeini International University and Islamic Azad University in Qazvin were selected. The participants were all adult learners of English ranging in age from 20 to 35.

Instruments

The first instrument used to assess the participants' intelligence profile was Mckenzie's (1999) MI inventory questionnaire, which consists of 90 Likert- type scale statements related to the nine intelligences proposed by Gardner (1999). This questionnaire includes 10 statements related to each of the nine intelligences. Learners were required to complete the questionnaire by placing 0 or 1 next to each statement. A validated sample of the test is available at [http://surfaquarium.com/MI/MI Invent.htm](http://surfaquarium.com/MI/MI%20Invent.htm).

The second instrument was "Motivated Strategies for Learning Questionnaire-MSLQ" developed by Pintrich et al. (1993). It included 81 items of which only 19 items were used. The MSLQ consists of a motivation section (31 items) and a learning strategies section (50 items). The learning strategy section contains 31 items regarding students' use of different cognitive and metacognitive strategies and 19 items concerning students' management of different resources. Effort management consists of 19 items, which includes managing one's time and study environment, regulation of one's effort, peer learning, and help-seeking. A validated sample of the test is available at <http://epm.sagepub.com/content/53/3/801>.

The third instrument was the "Goal Oriented Scale" developed by Midgley et al. (1998). This questionnaire consisted of 18 items, every 6 items measuring a different goal orientation; namely, task goal orientation, ability-approach goal orientation, and ability-avoid goal orientation.



RESULTS AND DISCUSSION

Investigation of the First Research Question

The first question attempted to see which types of multiple intelligences are predictors of resource management self-regulated learning. To this end, a stepwise multiple regression was used. Table 4 shows that kinesthetic and interpersonal intelligences entered into the regression equation (stepwise criteria: $p < 0.05$).

Model summary (Table 5) shows that the kinesthetic intelligence and resource management self-regulated learning share 42% of variance. Kinesthetic and interpersonal intelligences together share 6.3% of variance with resource management self-regulated learning.

Table 6 gives the results of the ANOVA performed on the model. The F-value and the significance level ($F(1,148) = 7.51, p < 0.05$) indicate that both models are significant.

Table 7 shows the Beta value and significance level of the observed T-value for each of the two intelligences that entered the regression equation. To see how much of the variance in resource management self-regulated learning is accounted for by each of the nine predictors, the standardized coefficients and the significance of the observed t-value for each predictor were checked. As the table shows, of the nine predictors, only kinesthetic and interpersonal intelligences account for a statistically significant portion of the variance in the dependent variable (resource management self-regulated learning). Both kinesthetic and interpersonal intelligences are equally the best predictor of resource management self-regulated learning; for every one standard deviation of change in one's kinesthetic and interpersonal intelligence, there will be about 0.17 of a standard deviation change in one's resource management self-regulated learning.

These findings indicate that two types of intelligence (kinesthetic and interpersonal intelligences) are predictors of resource management self-regulated learning. Based on these results, it can be concluded that the first null hypothesis is rejected.

Table 4: Variables Entered/ Removed¹

Model	Variables Entered	Variables Removed	Method
1	Kinesthetic	.	Stepwise (Criteria: Probability-of-F-to-enter $\leq .050$, Probability-of-F-to-remove $\geq .100$).
2	Interpersonal	.	Stepwise (Criteria: Probability-of-F-to-enter $\leq .050$, Probability-of-F-to-remove $\geq .100$).

¹Dependent Variable: resource management self-regulated

Table 5: Model Summary^c

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.220 ^a	0.048	0.042	9.954
2	0.274 ^b	0.075	0.063	9.846

a. Predictors: (Constant), kinesthetic; b. Predictors: (Constant), kinesthetic, interpersonal; c. Dependent Variable: resource management self-regulated learning.

Table 6: ANOVA^c

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	745.049	1	745.049	7.518	0.007 ^a
	Residual	14666.451	148	99.098		
	Total	15411.500	149			
2	Regression	1158.671	2	579.336	5.975	0.003 ^b
	Residual	14252.829	147	96.958		
	Total	15411.500	149			

a. Predictors: (Constant), kinesthetic

Table 7: Coefficients^a

Items	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	51.217	2.988			17.143	0.000
Kines	1.148	0.419	0.220		2.742	0.007
2 (Constant)	48.748	3.188			15.292	0.000
Kines	0.914	0.429	0.175		2.128	0.035
Inter	0.796	0.385	0.170		2.065	0.041

a. Dependent Variable: resource management self-regulated learning



Investigation of the Second Research Question

The second question attempted to see which types of multiple intelligences are predictors of motivational self-regulated learning. To this end, a stepwise multiple regression was used. The finding indicated that there is not significant relationship between multiple intelligences and motivational self-regulated learning. None of the intelligences entered into the regression equation; therefore, the second null hypothesis is safely supported.

DISCUSSION

Some of the findings of the present study are partially in line with a number of previous studies (eg. Ahmadian and Hosseini, 2012; Alghazo et al., 2009), which investigated MI as predictors of language learning and strategies. However, the findings are not in accordance with some other studies (eg. Razmjoo, 2008; Saricaoglu and Arikan, 2009), which have not emphasized MI types as predictors of language learning and strategy use. The important point is that self-regulated learning components (resource management and motivation) are two major language learning strategies. Therefore, we can conclude that if there is a positive relationship between MI types and language learning strategy, MI can also have a direct relationship with self-regulated learning components.

Based on Ahmadian and Hosseini (2012) study, linguistic intelligence was the best predictor of writing performance. Therefore, the present study is in accordance with their study. The present study is also compatible with the study of Sarani et al. (2012), which showed that the only positive relationship was between writing performance and verbal intelligence. The results of these studies generally approve the existence of a relationship between multiple intelligences and self-regulatory components.

The results of the present study are different from a number of studies that were reviewed in chapter two. Razmjoo (2008) reported that there was no significant relationship between language proficiency and MI types, while the present study indicated that except for motivational self-regulated learning, there was a significant relationship between MI and self-regulated strategies.

In the same way, Saricaoglu and Arikan (2009) found a negative relationship between kinesthetic, visual, and intrapersonal intelligences and grammar, whereas in this study except for motivational self-regulation, there were significant relationships between MI and self-regulated learning strategies.

One of the possible reasons for such differences may be partially attributable to the proficiency level of the participants. In this study, the participants were intermediate level students while in studies such as Razmjoo (2008), the participants were Ph.D. students.

Another possible reason could be gender differences in participants. In this study, gender was not considered. However, studies such as Razmjoo (2008), Saricaoglu and Arikan (2009) emphasized the prominent role of gender differences in MI area.

Another factor which makes this study different from other studies is that this study was conducted in the context of EFL, while most of the mentioned studies were carried out in ESL contexts. These areas of conflicts are probably indicative of the need for further research.

CONCLUSIONS AND IMPLICATIONS

The findings of the present study showed that kinesthetic and interpersonal intelligences made significant contributions to predicting resource management self-regulated learning, but there was no significant relationship between multiple intelligences and motivational self-regulated learning.

Based on these results, it may be concluded that MI types can be significant predictors of resource management self-regulated learning components, except motivational self-regulation. It can be concluded that not all learners have the same level of intelligences. Some students are stronger in one or more intelligences than others. Moreover, they use various types of self-regulated learning strategies. Since learners are equipped with different levels of various types of intelligence, and since they employ various types of self-regulated learning strategies, the logical conclusion to be drawn is that learners experience learning in different ways.

It is hoped that this research will provide implications for teachers, learners and material developers. The present study can help teachers of English to develop a clear understanding of MI theory to be implemented in a pedagogical context. Taking the findings of the study into consideration, teachers would be able to understand the significance of multiple intelligences and make informed choices in terms of methods and techniques to apply in their teaching in order to develop students' intelligences. When teachers know about the MI profile and learning strategies of learners, they can plan activities and provide learners with the best possible instruction.

The present study may also have implications for learners. As Arnold and Fonseca (2004) state, framework of MI theory is a helpful and beneficial tool for planning language learning tasks by which students can face different challenges. When students know about their potentiality and ability, it increases their self-esteem and motivation and also can help them to enhance their success in language learning. Moreover, by applying strategies of self-regulation, learners become responsible for their own learning and also learn how to solve problems, make decisions, manage and monitor their own learning.



Moreover, the present study may have implications for material developers. Materials developers should consider the impact of MI types and self-regulated learning and their relationship in language learning. They need to consider some helpful strategies like critical thinking and planning, responding to the communication needs of the learners and increase their responsibility for learning.

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