THE PREDICTIVE DEGREE OF UNIVERSITY STUDENTS' LEVELS OF METACOGNITION AND NEED FOR COGNITION ON THEIR ACADEMIC ACHIEVEMENT

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Abstract:

The purpose of this study is to find out the predictive degree of university students' levels of need for cognition and metacognition on their academic achievement. A total of 253 university students formed the study group. To collect the data of the study, 'The Metacognition Awareness Inventory' (MAI) and 'The Need for Cognition Scale' (NFCS) were used to measure students' metacognitive awareness and their tendency to think and enjoy thinking. For the students' academic performance, the average points (GPA) that they got during the term were taken into consideration. The correlation analysis revealed the fact that there is a significant and positive relationship between students' levels of need for cognition, metacognition and their academic achievement at the level of p<0.01. The multiple linear regression analysis suggested that the power of need for cognition and metacognition to predict academic achievement are meaningful. In another word, the two independent variables, namely need for cognition and metacognition can be considered as the significant predictors of the dependent variable, academic achievement.

Keywords: need for cognition, metacognition, academic achievement, language learning

1. Introduction

Variables belonging to cognitive domain and their relationship with academic achievement have been one of the concerns of educators as well as researchers for a

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long time (Coutinho, 2006; Coutinho, 2007), since these variables are linked not only with individual's cognitive capabilities but also their cognitive investment (Fleischhauer et al., 2010). It is suggested that cognitive preferences of students influence their perception of tasks, goals, determination, etc. (Chen & Wu, 2012). Among the cognitive preferences thought to affect academic achievement, metacognition and need for cognition can be considered as important variables. Martinez (2006) argues that the introduction and meticulous elaboration of metacognition has formed a kind of revolution in cognitive research.

Conceptualized by Flavell (1979), metacognition is generally described as knowledge about cognitive processes (Flavell, 1979; Schraw & Moshman, 1995; Aljaberi & Gheith, 2015) or in its simplest form 'knowledge about learning' (Wenden, 1998). In other words, it can be depicted as the capability to know what one can perform and what one cannot (Costa & Kallick, 2001). Since it refers to observe and control cognitive processes (Flavell, 2000; Efklides, 2006) which involve learning, setting goals, determining strategies, making plans (Karakelle, 2012; Wichadee, 2011), metacognition is considered as one of the most important predictors of academic achievement (Coutinho, 2007; Costa & Kallick, 2001; Van der Stel & Veenman, 2010).

Ambrose et al., (2010, 192-193) argue that as there is a mutual interaction between observing (monitoring) and controlling, metacognitive processes have a 'cyclic' feature and they suggest 'a five-step model' in which the learners evaluate the given task; calculate their own knowledge abilities, merits and determine the weak and strong sides; form their way; carry out methods to implement their strategy, observe the improvement and finally conform essential steps. Zulkiply (2006) puts forward the idea that these skills are crucial for learning and if the learners have knowledge of what they know or they do not know, then they have metacognitive consciousness.

Studies conducted by many researchers have yielded mostly the same results asserting that students having higher metacognitive knowledge are more successful with regard to academic performance than those with lower metacognitive knowledge (Young & Fry, 2008; Coutinho, 2006; Amzil, 2014; Kramarski et al. 2002; Hoffman & Spatariu, 2007; Aurah, 2013; Zulkiply, 2006; Wong, 2012; Sawhney & Bansal, 2015; Owo & Ikwut, 2015; Narang & Saini, 2013).

Flavell (2000) posits that the term metacognition, among other fields, has also been employed to language acquisition. According to Wenden (1998), who uses the term interchangeably with 'learner beliefs' (Wenden, 1999, 436), metacognitive knowledge is a significant component of language acquisition now that apart from being instructed, students are also in need of being taught how to enhance and improve their own knowledge on language acquisition in order to be more self-directed and

independent in their ways to learn the target language. In this way, students will settle on the ultimate verdicts concerning how to acquire the language efficiently and how to enhance their learning. Several studies put support behind these assumptions and they suggest that there is a positive association with metacognitive beliefs or knowledge and foreign language achievement (Wang et al., 2009; Zenotz, 2012; Meier et al., 2014). Raoofi et al., (2014, 36) in their meta-analytic review of 33 published studies concluded that the interference of metacognitive knowledge could enhance language performance.

Just as the individuals who have higher metacognitive knowledge or awareness show considerable academic performance, the ones being high in need for cognition also display remarkable capability 'to be motivated to acquire information and to think' (Coutinho et al. 2005, 322). Need for cognition, which is closely related with metacognition (Petty et al., 2009), is a notion based on the idea of 'the tendency for an individual to engage in and enjoy effortful cognitive endeavours' (Cacioppo et al., 1984, 306) or in other words, the term defines the individuals' orientation to think or enjoy thinking (Gülgöz & Sadowski, 1995).

It is argued that individuals being high in need for cognition search for information autonomously, make sensible inferences, have positive attitudes and behaviours towards problem solving (Karakelle, 2012); consider thinking as a pleasing activity, cope with matters that involve high mental endeavours (Gray et al., 2015; Meier et al. 2014); contemplate matters and think about everything deeper than those who are low in need for cognition (Petty et al., 2009) and view thinking as fun (McIntosh & Noels, 2004).

Studies indicate that need for cognition is a significant predictor of intellectual performance (Cacioppo & Petty, 1982; Coutinho, 2006; Elias and Loomis, 2002; Stuart-Hamilton & McDonald, 2001; Fleischhauer, et al., 2010). At this point, Sojka (2008) argues that the concept of need for cognition has to be separated from intelligence; as intelligence indicates intellectual ability whereas need for cognition is a matter of motivation to contemplate matters and to figure out problems as well as cognitive processing disposition.

McIntosh and Noels (2004) establishes a connection between learning a new language and the concept of need for cognition. According to this, acquisition of a language is a matter of cognition and thus it likely appeals to individuals who are high in need for cognition in that this could provide them a chance to exercise their mental abilities. It, therefore, might be anticipated that the ones who have higher level of need for cognition would display more efforts and attempts to acquire the target language.

It is, hence, essential to analyse metacognition and need for cognition as potential factors in learning and academic achievement since they are susceptible to interference,

conducive to improvement and they pave the way for better performance. Thus, studying and determining the relationships between the mentioned variables are thought to promote the academic performance of students and to improve educational activities as well as planning. In this regard, the research reported in this article aimed to investigate whether the individuals who are high in the aforementioned variables are actually more successful in terms of academic achievement than those who are low.

2. The Research Problem

In the light of theoretical framework above, this study addresses the following research question: *"What is the prediction degree of university students' levels of metacognition and need for cognition on their academic achievement?"*

3. Methodology

A correlational research design was applied to describe the statistical relationship among abovementioned independent variables, need for cognition and metacognition and dependent variable, academic achievement. Further, to determine the predictive degree of independent variables on the dependent variable, multiple linear regression analysis was applied.

3.1 Participants
The data of the study were collected from students attending prep classes of a public university in Turkey during the 2016-2017 Academic Year. The participants were randomly chosen and the scales were administered to a total of 253 students; 103 (40.7 %) were females and 150 (59.3 %) were males. Since it gives the chance to every member of the population to be selected and as the data are to be unbiased (Arık, 1998), in this study random sampling was put into practice.

3.2 Instruments
To collect the data of the study, The Metacognition Awareness Inventory (MAI) and The Need for Cognition Scale (NFCS) were used. For the students' academic performance, the average points (GPA) that they got during the term were taken.

3.3 The Metacognition Awareness Inventory
The Metacognitive Awareness Scale (MAI), originally developed by Schraw and Dennison (1994), was used to measure students' metacognitive awareness. The scale

was adapted into Turkish by Akın et al., (2007). Having 52 items in total, it is a five-point Likert scale. The internal consistency of the whole scale was found to be .95. The item-total correlations were found to range from .35 to .65 and test-retest reliability coefficient of the scale was found to be .95.

3.4 The Need for Cognition Scale

Originally developed by Cacioppo and Petty (1984), the Need for Cognition Scale was used in the present study to measure students' tendency to think and enjoy thinking. The scale was adapted into Turkish by Gülgöz and Sadowski (1995). Being a nine-point scale, the scale itself has 18 items in total and it was formed in such a way that half of the items have positive the other half has negative expressions. The test-retest reliability coefficient of the scale was found to be 0.55 (p<.001) and internal consistency of the entire scale was found to be 0.78. The item-total correlations ranged from .11 to .67.

3.5 Assessment of Academic Performance

The academic performance of the students were assessed through the general average points (GPA) that they got during the term were taken. The assessment criteria were as follows: two mid-term exams (40%), three pop-quizzes two reading exams (10%), writing portfolio work (10%), presentation and oral exam (15%) and class participation (5%).

4. Findings

In this study, the purpose is to determine the prediction degree of university students' levels of metacognition and need for cognition on their academic achievement. To achieve this aim, the data obtained from the study have been analysed in order to find out range, medium, maximum and minimum values as well as standard deviation. The findings are illustrated in Table 1.

Table 1: Range, Minimum and Maximum, Medium, Standard Error, Standard Deviation and of Students' Need for Cognition, Metacognition and Academic Achievement Values

	N	Range	Minimum	Maximum	X-Value	SE	SD
Need For Cognition	253	45.00	-6.00	39.00	20.00	.63	10.16
Metacognition	253	157.00	115.00	272.00	181.00	1.58	25.16
Academic Achievement	253	67.00	33.00	100.00	71.00	.82	13.16

In order to have a regression model, Pearson Correlation analysis has been applied to find out the relationship between dependent and independent variables. The results of the analysis have been demonstrated in Table 2.

Table 2: The Results of Correlation Analysis between Students' Levels of Need for Cognition, Metacognition and Their Academic Achievement

	Academic Achievement	Need for Cognition	Metacognition
Academic Achievement	1.00	.61**	.43**
p		.00	.00
Need for Cognition	.61**	1.00	.28**
p	.00		.00
Metacognition	.43**	.28**	1.00
p	.00	.00	
N	253	253	253

** significant at the level of p<0.01

The figures in Table 2 demonstrate the analysis between dependent and independent variables. It can be observed that there is a significant and positive relationship between students' levels of need for cognition, metacognition and their academic achievement at the level of p<0.01.

After determining the fact that the independent variables correlate with the dependent variable, the regression analysis of prediction degree of the students' levels of need for cognition and metacognition in academic achievement has been computed. The findings obtained from the analysis have been shown in Table 3.

Table 3: The Results of Regression Analysis of Prediction Degree of Students' Levels of Need for Cognition and Metacognition on Academic Achievement

Model	B	SE	β	t	p
Stable	28.93	4.52		6.39	.00**
Need for Cognition	.69	.06	.53	10.89	.00**
Metacognition	.14	.02	.28	5.78	.00**

Dependent Variable: Academic Achievement R^2=.58   F=102.66

** Significant at the level of p<0.01

Through the regression analysis, firstly, it has been examined that how much of the variance in academic achievement is explained by independent variables, need for cognition and metacognition. As it is illustrated in Table 3, 58% (R^2=.58) of the variance in academic achievement is explained by need for cognition and metacognition. What is

more, the prediction degree has been found to be F=102.66, which is significant at the level of p<0.0.1. Examining prediction degrees of independent variables in academic achievement, it is observed that, the power of need for cognition (t=10.89, p<0.01) and the power of metacognition (t=5.78, p<0.01) to predict academic achievement are meaningful. In another word, the two independent variables, namely need for cognition and metacognition are significant predictors of dependent variable, academic achievement.

5. Results and Discussions

The primary objective of this study has been to identify the prediction degree of students' levels of metacognition and need for cognition on their academic achievement. The findings gained from the data have revealed the fact that the two independent variables, metacognition and need for cognition are significant and meaningful predictors of academic achievement. It appears that the results of the present study are consistent with the findings of some studies in the literature. For instance, Wang et al., 2009, in their study, concluded that the students having high level of metacognitive beliefs are more successful in learning a foreign language than those who do not have. Similarly, Raoofi et al., (2014), in their meta-analysis pointed out that metacognitive interventions likely promote foreign language acquisition. Sawhney and Bansal (2015) also investigated the relation of metacognitive awareness with academic achievement and asserted that there is a significant and positive relationship between academic achievement and metacognitive awareness. Likewise, Kana (2014) found significant relationship between students' using metacognitive strategies and their academic achievement. Narang and Saini (2013) also studied the effects of metacognition on academic achievement and they came to the conclusion that students who have high level of metacognition made better in academic tasks.

As for the relationship between need for cognition and academic achievement, the findings from the study are also consistent with several studies. For example, Coutinho et al., (2005) argued that students having high level of need for cognition showed better performance in fulfilling the tasks. What is more, Coutinho (2006) investigated the relation of need for cognition with academic performance and maintained that the need for cognition was a significant predictor of intellectual performance. Another study conducted by Sadowski and Gülgöz (1996) indicated that students being high in need for cognition demonstrated better performance and academic success than those who are low in need for cognition. Similarly, Elias and Loomis (2002) in their study with undergraduate students came to the conclusion that

there is a significant correlation between students' level of need for cognition and their general point average.

6. Recommendations

It must be borne in mind that there are certain limitations of the present study. Firstly, the scales have been applied to the university students only studying in preparatory classes. Including students from other English courses in the research may yield different findings. What is more, even though the sample size of the present study is thought to be adequate for the necessary statistical analysis, having a larger sample size could increase the efficacy of the research. Another limitation may arise from the timing of application of the scales. Since the scales were applied towards the end of the term, when the students might feel that they are overloaded with homework, assignments or projects, the responses may not reflect their real attitudes, thoughts or feelings. Even so, the findings of the study are thought to have helpful implications for teachers, policy makers in education as well as the other stakeholders in teaching and learning.

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