ASSESSING DIMENSION OF METACOGNITIVE SKILLS AND ITS RELATIONSHIP WITH ACADEMIC ACHIEVEMENT IN HIGH SCHOOL STUDENTS

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ABSTRACT

Background and aim: *The present study, which was conducted in correlational framework, aims to examine the relationship between cognitive skills with academic achievement in a sample of high school students in Kermanshah city, Iran.*

Materials and methods: *The population included a total number of 27627 high school students in Kermanshah in 2013- 2014, among whom 200 applicants were selected through multistage cluster sampling. Cognitive and metacognitive questionnaires were employed as research tools and their reliability were measured through split half and coefficient alpha, which were reported as 0.84 and 0.73 for cognitive questionnaires and 0.92 and 0.79 for metacognitive questionnaire. To examine applicant academic achievement. Their academic files in schools as well as their mean scores were carefully considered. The data were analyzed through Persons correlation coefficient and multistage regression in SPSS, v. 20.*

Results: *The finding showed that there was a correlation between cognitive skills and academic achievement and between metacognitive skill and academic achievement. The results of multistage regression, in addition, showed that semantic expansion among cognitive components and control and supervision among metacognitive components could explain the variance of academic achievement. Furthermore, it was revealed that learners' views were significantly related to the metacognitive skills, and both cognitive and metacognitive skills based on gender and region, respectively.*

Conclusion: *According to the finding concluded that students who are recruited cognitive and metacognitive skills, experience high academic achievement and using of these strategies and effective in academic achievement.*

Key words: *Cognitive skills, metacognitive skills, academic achievement, education in Kermanshah, high school.*

Introduction

Metacognitive means the supervision of learners on their own learning and regulating knowledge process[1]. One of the most effective methods of the metacognitive skill training is equipping the students with knowledge's strategy, cognitive process, training experiences and using the metacognitive strategies and evaluating the results[2]. Many studies reported that using the cognitive method in class caused the improvement of problem-solving learning skills, research and thinking in higher order[3]. Academic achievement is the knowledge, public or private acquired skill in relation with lessons subject which usually evaluated by teacher through tests or symptom or both of them[4]. Academic achievement not only depend on the individual's base knowledge but also it related to the other factors such as awareness of different knowledge and learning strategies and how to take advantage of this knowledge[5]. In educational systems, academic achievement considered as one of the most important indicator for improving the educational and scientific activities[6]. Yang (2005)[7] in his research found that metacognitive strategies caused enhanced of the self-learning skill, improve the

independence of learner and facilitate the learning capability in students. Many of the studies in the metacognitive field showed that students who used metacognitive strategies for more leaning have better academic performance than students who don't have tendency to use this strategies[8-12].

The main aim of the metacognitive training is self-controlling and self-learning in order to independent the learners[13]. Most of the learning and transfer learning problem is due to the lack of skills and metacognitive strategies[14]. Also metacognitive strategies help the individuals in increasing the efficiency of learning[15]. One of the most important reason of the lack of metacognitive training skills strategies in class is that, the teacher do not valued this strategies or doesn't have knowledge about it. Therefore it is necessary to nurture this property in teachers[16]. Metacognitive should not considered as a final goal in education, it should consider as an opportunity for equipping the learners with knowledge and necessary skills for managing their own learning[17, 13].

The results of the Ashoori et al. (2014) study confirmed the meditative role of the metacognitive strategies among the academic achievement goal direction. Salehi and Mirzakhani (2014) in their research showed that using each of these metacognitive strategies could increase the academic performance[18]. Also Karami et al. (2013) in their study showed that training the metacognitive strategies could improve the motivation and academic self-concept[19]. Safari and Mohammad-Jani (2012) in their research reported that there was a significant and positive correlation between metacognitive skills and average score of the students and a significant correlation between metacognitive component and the average score of the students which these correlation were diagnosed significant in relation with strategies and study's method and the types of the metacognitive knowledge[20]. Abolghasemi and GolpoorNarimaniGhamari (2010) in their research showed that by increasing the impaired metacognitive beliefs the academic successes of the students with anxiety would decreased[21]. AminiZorar (2007) in his study found that metacognitive have a positive and significant correlation with academic achievement[22].

The results of the Ibabe and Jauregizar (2010) study showed a relation between metacognitive variables and students efforts and performance[23]. Parviz and Sharifi (2011) studies considered the using of the metacognitive strategies effective in academic achievement[24]. Malekian and Narimani and SahebJamei (2010) study, showed that among the metacognitive strategies, control and monitoring have the main role in the achievement motivation of learners(25).Tan and Laswad(2008) showed that the context and previous metacognitive knowledge have significant effect on the students performance(26). Therefore the present study in line with the importance of the metacognitive skills and the effect of these skills on the academic achievement would evaluate the relationships between the student's metacognitive skills and its relation with their academic achievement in high schools.

Materials and methods

This study was descriptive correlational. The statistical population is all the boys' students in high schools of third district in Kermanshah (the pre-university wasn't considered in the study). The sample volume was determined by using Gerjesi and Morgan table and the sampling method was multi-scale cluster random. First, from all the male high schools of the Kermanshah's third district, 6 schools were selected randomly then among some of the classes in each school 200 students selected randomly as a sample and surveyed. For collecting data, after the necessary coordination with the Department of Education District three in Kermanshah, a list which contain a number of the male high school would receive and then the other stages of sampling were done. The collecting data tools were the metacognitive strategy's questionnaire.

The questionnaire were used in Malekian and Narimani and SahebJamei (2010) study and its validity was confirmed[25].the questions of this questionnaire contain the metacognitive strategies. These strategies include planning, regulating, control and monitoring which in Likert scale formed 5 range (the lowest=1 to the highest= 5). Also the reliability of this questionnaire were analyzed by Alpha cronbach and the Alpha cronbach coefficient of metacognitive strategies was calculated 0.92. For analyzing the data the average statistical method and standard deviation were used. The kolomogrov-smirovtest were used for evaluating the normal distribution of data. The Pearson correlation was used for evaluating the relation between the variables and the multi-regression were used for estimation of the metacognitive skills dimension's portion in predicted academic achievement.

The data were analyzed by SPSSv-20 software. For showing the descriptive level of the data the average, the standard deviation were used and in inferential statistical level the Pearson correlation and regression step to step coefficient were used.

Results and discussion

Based on the main hypothesis of the research, there was a relation between metacognitive skills and academic achievement in high school students of Kermanshah. Table 1 by showing the results of the Pearson correlation Matrix in relation with metacognitive skills and its component and academic achievements, explain this hypothesis.

Correlationmatrix		Academic achievement
Metacognitiveskill	Correlation Coefficient	0.481
	Significant level	0.001
	Mean	52.9
	Standard Deviation(S.D)	9.323
	Number	200
Planning skill	Correlation Coefficient	0.335
	Significant level	0.001
	Mean	13.05
	Standard Deviation(S.D)	3.559
	Number	200
Regulation skill	Correlation Coefficient	0.357
	Significant level	0.001
	Mean	13.095
	Standard Deviation(S.D)	3.084
	Number	200
Controlandsurveillanceskill	Correlation Coefficient	0.44
	Significant level	0.001
	Mean	26.755
	Standard Deviation(S.D)	5.005
	Number	200

Table 1: Pearson correlationmatrixon the relationship betweenits components and themetacognitiveskillsandacademic achievement.

The table 1, showed the correlation coefficient between metacognitive and academic achievement. Therefore, the obtained results, null hypothesis (lack of relation between researches variables) rejected, and research hypothesized (existing a rela-

tion between researches variables) confirmed (r= 0.481, P= 0.000). Also, based on the findings, it could be said that, the correlation coefficient between three components of the metacognitive skill with academic achievement is as bellows: The planning skill (r= 0.335, P= 0.001). The regulating skill (r= 0.357, P=.000). The control and monitoring skill (r=0.440, P=0.000) (Table 2).

Index	R	R²	The standard error ofestimate
Value	0.487	0.237	1.291

Table 2: Summary of regressionpatternbetweenmetacognitiveskillsand academic achievement.

The regression pattern findings between metacognitive skills and academic achievement showed that the metacognitive skill explain the academic achievement based on the amount of the variables variance ($R2= 0.237$). For evaluating the significant of this amount, F test was reported. (Table 3).

Test	Sum of squares	Df	Mean of squares	F	Significant level
Regression	101.497	3	33.832		
Residue	326.768	196	1.667	20.293	0.001
Total	428.265	199			

Table 3: Ftest and significance level between metacognitive skillsand academic achievement.

The F statistical test results showed that, the metacognitive skills were statistically significant ($R2= 0.237$, df= 3196, F= 20.293). This fact indicate that, metacognitive skills have a significant explain for student's academic achievement. In table 4, the portion of each three component (planning, regulation, control and monitoring) were showed significantly and separately in predicting of the academic achievement.

Components	Standard coefficients		t	Significant level
	B	β		
Constant Value	11.526		21.444	0.001
Planning skills	0.233	0.141	1.855	0.061
Regulation skills	0.248	0.13	1.667	0.097
Control and surveillance skill	0.763	0.335	4.537	0.001

Table 4: Components regression coefficients of metacognitive skills and academic achievement.

The results showed that, just the control and monitoring skills component have a significant

explain for academic achievement of high schools students (β= 0.335, P= 0.001). According to the relation level of 335% between planning skill and academic achievement, it could be said that, this relation was significant and positive. The conclusion was consistent with the bellows researches results:Yang (2007) believed that meta-cognition strategies were caused the increase of the self-learning skills and the independence of the learners and facilitate the learning capabilities of the students[7]. Ibabe and Jauregizar (2010) showed a relation between metacognitive variables and the student's effort and performance[23].

Cooper and Stewart (2006) showed that, metacognitive would increase with the teaching experiences. Also the teacher's awareness of metacognitive, caused the performance improvement and also development of the students as an independent leaner which by high metacognitive awareness could learn and have creativity and thinking ability in different position[27]. Safari (2009) by evaluating the effect of the meta-cognitive training on the academic performance and students metacognitive awareness found that, the average of the academic achievement and the level of the metacognitive awareness in the case group was significantly more than the control group[2]. Malekian, Narimani, SahebJamei (2010) found that among the metacognitive strategies, control and monitoring have the most important role in learners achievement motivation[25].

Safari and Mohammadjani (2012) showed that between the metacognitive skills and average score of the students, there was a positive and significant relation and between metacognitive component and student's average score there was a significant correlation and this correlation was significant for strategies and studying method and the types of the metacognitive knowledge[20]. Salehi and Mirzakhani (2014) reported that between using the metacognitive strategies and each of the component with academic achievement there was a significant relation and using each of these strategies caused the increase of the academic performance[18].

Pearson correlation coefficient showed that, the student's use of regulation strategies in a level of 357% was related with their academic achievement and this relation was reported positive and significant. These results were consistent with the bellows study's results: Liem et al. (2008) reported that the students which used the metacognitive method for more effort in learning have better acad-

emic performance than students who don't have tendency to use this strategy[11, 20, 25, 27]. The results showed that, the control and monitoring skill was related to the student's academic achievement (0.44) and it considered as a third dimension of metacognitive dimensions.

The results were consistent with Ibabe and Jauregizar (2010) study which showed a relation between the metacognitive variation and the student's effort and performance. Also inclusion of the self-evaluation in lesson planning for improving the metacognitive knowledge in students is necessary[18, 23, 25, 27]. The regression analysis results showed that the meta-cognition skills, explain the academic achievement for 237% from variable variance and this explain was significant. Also, the F test results confirmed this effectiveness.

This results were consistent with Liem et al. (2008)[11] research and Tan and Laswad (2008) study which evaluate the effect of context and pervious metacognitive knowledge in students performance in a primary accounting period and one of the aims of their study was evaluating the reflect of the students difference in context and previous metacognitive knowledge on students academic performance in a primary accounting period. Also, the independent variables have significant effect on the previous knowledge context and students academic performance [20, 25, 27].

Conclusion

The metacognitive skills dimension have a significant explain for student's academic improvement in Kermanshah's high school. In evaluating the portion of the dimensions in predicting the academic achievement, just the control and monitoring skill could showed a significant explain for the academic achievement. But other component were not significantly effective. A significant positive relation between planning skill and academic achievement showed that, students who could control and monitor their intellectual process reach their learning goals better because these students could diagnose the proper time for using the skills and if in the way of completion their cognitive structure faced with a problem, they could try to improve the progress and learning by review and controlling their intellectual mechanism. In learning process, before everything, having a proper plan for methods and time of the study is necessary for students. By proper planning students could learn with more

interests and focus and as a results, the students learning and academic achievement is increased. Also the students who regulate their study and use their metacognitive skills to learn better have better improvement and academic performance.

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