

The relation of short term memory and long term memory with students' academic improvement

Leyla Mostafazadeh Girkandy¹, Mostafa Sheikhzadeh^{1*} and Ali zeinali²

1- Department of education, Urmia branch, Islamic Azad University, Urmia, Iran

2- Department of education, Khoy branch, Islamic Azad University, Khoy, Iran

Corresponding author: Mostafa Sheikhzadeh

ABSTRACT: This research is done by the aim of analyzing the relation of short term memory and long term memory with students' academic improvement. Memory contains those activities that appear as memorizing, remembering, recognizing and doing what is learned before. Statistical population of this research covers 1540 girl students in guidance stage in Salmas Township that are educating in academic year 2012- 2013. Sample volume calculated equal to 308 ones through formula and participants have been selected by cluster random sampling and according to academic stage, among guidance schools for girls in Salmas Township of Iran. Then for measuring capacity of students' short term and long term memory PRMQ (proactive and retroactive short term and long term memory questionnaire) of Smith, Della Sala, Lagie, Maylar, (2000) was used. Reliability of questionnaire calculated equal to 89% by using Cronbach's alpha. For evaluating Students' academic improvement their GPA of last three semesters was used. Main result of this research is this matter that there is a positive and significant relationship between operation of students' short term and long term memory with their academic improvement and status and in analysis of age and operation of students' short term memory, but there is no positive and significant relation in analysis of age and operation of long term memory and between students' long term memory and short term memory operation with their academic stages.

Keywords: short-term memory, long term memory, academic achievement, academic status.

INTRODUCTION

Problem expression

Memory is a general sense and refers to those set of mental progresses that makes able the individual to save experiences and perceptions and recalling them (Poorafkari, 2001). Memory is a kind of mental activity that allows us to maintain self- consciousness states such as pleasures, pains, leanings, demands, emotions, emotional perceptions, thoughts and judgments and restore them again in mind. Memory allows us to recognize and refer to the past. Memory refers to brain capability in accumulating, keeping and remembering information (Chaild, 1994; Asadzadeh quotes, 2007). Research findings suggest that most of student's problems are due to their lack of awareness from memory and cognitive processes (Gage and Berliner, 1992; Seif, 2006). Just parts of the information that are considered in emotional memory enter to the short term memory and remaining information is destroyed. Entered information to the short term memory is saved for a short time (Maximum 30 seconds). Part of these information that are repeated or are under mental rehearsal or communicate with previously learned information, transfer to the long term memory and remaining information in short term memory substitute new information and come out from short term memory. The academic improvement term refers to manifestation of a student's academic standing.(Seif quotes, 2010) believes that academic improvement is result of things that student had been learned them from some educational experiences. This research is intended to study more accurate the relation of short term and long term memory in girl students' academic improvement and status in guidance period and wants to answer this question that what relation exists between academic improvement and status and students' short term and long term memory?

MATERIALS AND METHODS

Method of research

Method of research is descriptive in survey type. Statistical population of this research covers 1540 girl students in guidance schools of Salmas Township in Iran, in academic year 2012- 2013. Sampling method is cluster random sampling and from each of these three schools randomly 2 classes were selected for second grade and two classes for third grade. Sample volume is equal to 308 students. Questionnaire of research is PRMQ (Smith et al., 2003) and is confirmed by factor analysis, and suitability indexes (CFI, NFI, X^2 , RMSEA) confirmed model's fitting with data. Also, reliability of questionnaire is obtained equal to 89% by using Cronbach's alpha.

RESULTS AND DISCUSSION

Findings and discussion

Examining first hypothesis

There is relation between operation of girl students' short term and long term memory and their academic improvement and status in guidance stage.

Table 1. correlation matrix of students' memory's operation with academic improvement and status

Academic improvement	Long term memory	Short term memory	Correlation matrix
		0/55**	Long term memory
	0/31**	0/36**	Academic improvement
0/46**	0/17**	0/12	Academic status

** Correlation is significant in 0.01 level (two ranges)

* Correlation is significant in 0.05 level (two ranges)

shows the correlation matrix between predictor variables (short term and long term memory) and criterion (academic improvement and status). There is a positive and significant relation between operation of short term memory and academic improvement, but there is no positive and significant relation between short term memory and academic status. There is a positive and significant relation between operation of long term memory and academic improvement. And also there is a significant and positive relation between operation of short term and long term memory and academic improvement and status. So first hypothesis is confirmed, means that there is a significant and positive relation between girl students' short term and long term memory and their academic improvement and status in guidance stage. Short term memory, alone, with not considering other predictor variables, explains 13% and 1% of variances between students' academic improvement and status respectively. Also, long term memory, alone, with not considering other predictor variables, explains 10% and 3% of changes (variance) between academic improvement and status respectively.

Examining research question

How much percent operation of girl students' short term and long term memory in guidance stage explains their academic improvement and status variance?

To answer research question, students' short term and long term memory operation entered into multi variable regression equation as predictor variable (independent) and by simultaneous method, in order to analyze their relation and effectiveness on academic improvement and status as criterion variable (dependent). First column of Table 2 shows multi variable regression analysis of students' short term and long term memory operation with their academic improvement. In this model 16% of students' academic improvement variance is explained through operation of short term and long term memory. The significant result of variance analysis examining shows that presented model is significant ($P < 0.001$, $280 = 26.69$, F_2). In this model short term and long term memories have positive and significant effects on students' academic improvement and are its significant predictors ($B = 0.10$, $P < 0.001$) and ($B = 0.13$, $P < 0.001$) respectively.

Second column of Table 2 shows multi variable regression analysis of students' short term and long term memory with their academic status, in this model 3% variance of students' academic improvement is explained by operation of short term and long term memory. Significant result of variance analysis examining shows that presented model is significant ($P = 0.020$, $280 = 3.95$, F_2). In this model short term and long term memory have positive and significant effect on students' academic improvement and their predictors are significant. Respectively ($B = 0.10$, $P < 0.001$) and ($B = 0.13$, $P < 0.001$). (Beta measures show relative importance criterion of predictor variables between academic improvement and status).

Table 2. multi variable regression analysis of students' short term and long term memory operation with academic improvement and status

Significant level	β	Significant level	F	Freedom degree	R ²	R	Method	Academic status	Short term memory	long term memory
0/001 0/001	0/28 0/18	0/001	26/69	2 278 280	0/16	0/40	Simultaneous	Academic status	Short term memory	long term memory
0/050 0/043	0/10 0/13	0/020	3/95	2 278 280	0/03	0/17	simultaneous	Academic status	Short term memory	Long term memory

Examining second hypothesis

There is relation between girl students' short term and long term memory in guidance stage.

Table 3. Pearson correlation coefficient between age and operation of students' short term and long term memory

age	Pearson correlation
0/11	Short term memory
0/04	Long term memory

* Correlation is significant in 0.05 level (two ranges)

Table 3 shows that there is a positive and significant relation between students' age and with their short term memory operation but there is no significant relation between students' age with long term memory. Short term memory operation, alone, with not considering effect of other predictor variables explains 1% age changes in students.

Examining third hypothesis

There is a difference between academic stages and operation of girl students' short term and long term memory in guidance stage.

Table 4. difference of students' short term and long term memory operation in guidance second and third grade

Significant level	Freedom degree	t	Variance equality test		mean	grades	t- test
			Significant level	F- level			
0/056	296	1/92	0/20	2/15	15/93 16/95	Second Third	Short term memory
0/698	296	0/39	0/12	2/39	13/35 13/18	Second third	Long term memory

Table 11 shows that there is no significant difference between students' short term and long term memory operation in second and third grades. So third hypothesis is rejected ($t(296) = 1.92, P=0.056$) and ($t(296) = 0.39, P=0.698$). Operation of girl students' short term and long term memory is equal in guidance second and third grade.

Discussion

There is a positive and significant relation between operation of short term and long term memory and between academic improvement and status. This hypothesis is consistent with researches of Tozani et.al (Karimiyan, 2013) that development and improvement in memory's operation due to practice has direct relation with learning approaches and can reach the memory's operation to the desired level. Also it is consistent with research of Ghorbanlizada (Karimiyan quotes, 2013) that learning approaches can affect active memory capacity that is a part of short term memory. Results show that academic improvement and status have direct relation with students' short term and long term memory. Students with high active memory capacity use more learning approaches and further students with high active memory capacity have higher academic status. Research of Asadzadeh confirms existence of the positive relation between active memory capacity and academic improvement. Reviewing and analyzing the performed studies in this field indicates that learning approaches can be taught and teaching these

approaches is effective in academic improvement, improving the learning speed and problem solving. These results are consistent with researches of Motavali, (1997) and Avansiyan, (1998). Then by using memory improvement strategies like repeating and exercising, mental rehearsal and organizing, academic improvement can be greatly enhanced.

REFERENCES

- Asadzadeh H. 2007. Active memory, educational technology and learning, in almanac of second seminar of educational technology.
- Asadzadeh H, Mofakhari Haji Mirzaie S and Karimi Y 2010. Effect of teaching educational approaches on girl students' active memory, in high school grade of Tehran city.
- Avansiyan E. 1998. Role of teaching Meta cognitive approaches in girl students' comprehension and learning speed in guidance schools of Tehran city. Master's thesis, faculty of psychology and training sciences, Alame Tabatabaie University.
- Karimiyan H. 2013. Take a look to memory and amnesia in psychology. <http://marifat.nashriyat.ir>.
- Motavali SM. 1997. Analyzing effect of teaching Meta cognitive approaches on reading, comprehension, and learning speed on high school students in first grade, in Ferdos Township. Master's thesis, faculty of psychology and training sciences, Alame Tabatabaie University.
- Poorafkari N. 2001. Comprehensive dictionary of psychology, psychiatry English- Persian, first volume, third edition, Tehran, contemporary culture.
- Seif A. 2006. Training psychology (learning and teaching psychology), Tehran: Agah.
- Seif A. 2010. Learning and studying methods.