

The Efficacy of Teaching Metacognitive Strategies on Improving Achievement Motivation and Academic Achievement of Blind Students

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ABSTRACT: The current study aimed at examining the efficacy of metacognitive strategies on improving achievement motivation and academic achievement of Blind students. This research is quasi-experimental and enjoyed a pre-test, post-test design with control group. Accordingly, considering the entry requirements to the study and using multi-stage sampling, 30 persons were selected out of the blind students of middle schools in Tabriz during 2012-2013 academic year and were randomly assigned to experimental and control groups. The experimental group was instructed about metacognitive strategies for 10 sessions, but the control group received no intervention. To gather data three instruments were used: a) Herman's 29-item questionnaire of achievement motivation. B) The academic report cards of first and second semesters of the students. The data were analysed and interpreted by making use of MANCOVA of SPSS-18 software. The results proved that teaching metacognitive strategies lead to a significant difference between the performance mean of both the experimental and control groups in respect of achievement motivation and academic achievement in the post-test stage ($P < 0.001$). In line with the results, to improve achievement motivation and academic achievement, metacognitive strategies of study and learning can be utilized.

Keywords: Blind Students, Metacognition, Achievement Motivation, Academic Achievement

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INTRODUCTION

Blindness is the most common sensory impairment [1]; without visual sense and individual's perception of his/her surrounding will be different and this can result in emotional, social, academic and motivational problems such as small adaptation, lack of activity, lack of interest in others, lack of motivation and academic achievement, depression as well as low self-concept. Blindness places an individual in an extremely critical condition and changes him from an independent to a dependent person. Restricting and transforming the range of the experiences of blind children and adolescents along with decreasing the ability to move, control over and communicate with environment, blindness affects their cognitive and emotional growth. Consequently, not having the opportunity to fully experience the environment can reduce academic, motivational, personal, social achievement and growth of a blind person and incurs the feeling of incompetency, dependency and low self-esteem which ultimately lead to less social, emotional and educational-academic adaptation.

The findings of an investigation by Pekrun et al. [2] signify that achievement motivation is associated with learning, academic achievement and the emergence of negative emotions as stress and anxiety which give rise to a drop in academic achievement; thus, those who are of high motivation and desire to progress will endeavor more in all fields especially academic ones. Besides, motivation and academic achievement can be promoted by deploying some strategies; hence, we can create and improve motivation and academic achievement in students through teaching cognitive and metacognitive methods.

The structure of academic achievement motivation is attributed to those behaviors that are related to learning and progress. Academic Achievement motivation has been defined in line with various approaches; some of these approaches deal generally with success-related motivation, one of these is the approach of goals. This approach is created based on adaptive and maladaptive motivations [3]. Pieces of research on the goal-oriented approach have demonstrated that children with similar abilities present a variety of responses when faced with learning difficulties. Some, despite high-level ability exaggerate difficulties in a way that it seems their abilities are limited and they are disappointed at making any effort for success which is interpreted in terms of a learned therapy and is maladaptive since it is a barrier for a child to achieve worthwhile goals. On the contrary, there are other people who think these problems can be tackled and in lieu of sadness, they have the pleasurable feeling of overcoming challenges, they reinforce the ability to solve problems by changing their strategies that these reactions are called Mastery oriented responses.

In Husent's view [4]; academic achievement motivation is an aspect of motivation which is called student's intrinsic motivation through which the individual perceives him/herself as one who has enough competence and self-control. Self-control is divided into the two following sections:

1-Control opportunity that is an opportunity given to students so as to decide for their academic affairs.

2- The control ability that is a situation in which the student must feel competent so that h/she can control and dominate it.

Academic achievement motivation can lead to other outcome such as academic success and interest in the study and the institute. Thus, it is essential that factors related to students' academic achievement motivation and academic achievement be recognized and presented to educational system's organizers, teachers and parents.

Another variable that is associated with academic achievement motivation and academic achievement is metacognitive strategies. The term metacognition is ones' knowledge about his/her cognitive processes and the way to use them efficiently to achieve learning objectives. In other words, metacognition is the self-knowledge or self-awareness of cognitive system [5]. For Flavell [6]; metacognition is a tool to manipulate and organize cognitive processes which the main goal of teaching it, is self-control and self-instruction, so that learners can become independent learners who can direct, observe and ameliorate their cognitive and learning processes in line with their determined goals. Plenty of learning difficulties and learning transfer stem from the lack of metacognitive processes and strategies. A cognitive strategy includes organization, repetition and mental review, expansion or making connection between materials. Metacognition means the awareness of self-instruction and the supervision on it. As cognitive strategies are learning strategies, metacognitive strategies are the tact to monitor cognitive strategies and direct them. The major metacognitive strategies can be divided in to three categories of planning, monitoring and organizing. Metacognition plays a key role in successful learning. The study of successful learning is important for examining metacognitive activity and determining effective components of metacognition, Swanson [7]. Students, who have a strong intrinsic motivation for learning and competence, use complex cognitive processes including expansion or organization.

Metacognition plays a pivotal role in the learning process. For a teacher and learner, metacognition means that learners are capable of promoting their learning to introspection while they are reading, writing and problem solving and teacher can simply enhance this awareness by informing the students about effective strategic solving problems and discussing about motivational and cognitive characteristics of thought. Learner can obtain commitment, positive and individualistic attitude towards learning and the accuracy of and metacognitive elements through introspection and regular activity. A variety of studies have been conducted on the nature of the effect of using metacognitive strategies. They have generally reflected that learners who use appropriate strategies that are tailored to learning assignment can achieve greater progress in their learning activities. Garner [8]; has proposed that existing pieces of research illuminate that strategic behavior enhances learning. It has also been made clear that skilled learners know when to act strategically. Flavell [9]; indicated that poor students are often ignorant of recall strategies, are not engaged in metacognitive activities and do not feel the need to be engaged in this field. In a study on high school students, [10]; drew the conclusion that there is a meaningful positive correlation between metacognitive monitoring on reading comprehension with GPA score.

Hence, the research hypotheses are:

1 -Teaching learning and study strategies (metacognitive) has a positive effect on the achievement motivation of blind students.

2 -Teaching learning and study strategies (metacognitive) has a positive effect on academic achievement of blind students.

MATERIAL AND METHODS

The Research methodology enjoyed a quasi-experimental, pre-test and post-test design along with control group. The statistical population of the study comprised all blind students of middle schools of Tabriz, Iran. To select the statistical sample, 30 students were chosen according to the entry requirements of the study, by multi stage sampling. Then, they were randomly assigned to experimental and control groups.

Measurement instruments of the study are:

A-Hermans' 29-item questionnaire of achievement motivation [11]: In 1970, Hubert Hermans designed a motivation Achievement questionnaire on the basis of current theoretical and experimental knowledge about the need to progress by examining the studies related to this field. The questionnaire's validity was verified through internal consistency and factor analysis and its reliability was determined to be 0.83 and 0.74 through Cronbach's alpha and test-retest method, respectively. The items of the questionnaire are incomplete sentences and each sentence is followed by four choices. To have a homogeneous questionnaire, for all the 29 questions, four choices are written. The choices are scored in terms of the intensity of achievement motivation from low to high or high to low. As a result, some questions are positive and others are negative and the choices range from 1-4 and the variation range of the whole questions is from 29-116. The test interpretation is based on the total score, that is, high total score reveals high achievement motivation and low score reveals low achievement motivation of an individual.

B-The GPA score of the first and second academic semester of students was utilized to determine the academic achievement of the students .

The post-test related to achievement motivation questionnaire was performed on both groups in identical, natural and simultaneous condition. To examine the academic achievement of the students, their scores were taken from the school's office and the average score of each student in the first semester along with the results of filled out questionnaires were recorded and saved. After giving the pre-test the teaching course began for the experimental group in 10 sessions.

The teaching course introduces the students to activities which are associated with planning strategies, monitoring, evaluating, and organizing (which is fully listed in Table 1), necessary theoretical materials (presented by the instructor) as well as practical ones through doing assigned activities (under the supervision and control of the teacher).

After the termination of teaching period, the post-test related to Herman's achievement motivation questionnaire was given to the experimental and control groups once more in an identical and simultaneous condition and after the end of the second semester, the students' academic achievement was determined through their average scores.

To analyze and interpret the data, descriptive and inferential statistical methods were used. Considering the research design, the type of hypotheses and the derived data, MANCOVA of SPSS software was used for investigating the hypotheses.

RESULTS

Table 1. Mean and standard deviation of the scores of academic achievement and achievement motivation in experimental and control groups in pre-test and post-test

Variables	Stage	group	M	SD	N
Academic achievement	Pre-test	Experimental	12.5540	0.96541	15
		Control	12.4620	0.93085	15
	post-test	Experimental	13.5833	0.99313	15
		Control	12.5340	0.93292	15
Achievement motivation	Pre-test	Experimental	71.9333	8.59790	15
		Control	71.4667	9.61299	15
	Post-test	Experimental	76.1333	8.48416	15
		Control	71.0000	9.69536	15

As it is presented in table 1, the mean and standard deviation of academic achievement in pre-test stage of the experimental group are respectively 12.5540 and 0.96541, control group are 12.4620 and 0.93085, in post-test stage the mean and standard deviation of experimental group are 13.5833 and 0.99313 and control group are 12.5340 and 0.93292. As for the variable of achievement motivation in pre-test stage, the mean and standard deviation for the experimental group are respectively 71.9333 and 8.59790, for the control group are 71.4667 and 9.61299, and in the post-test stage the mean and standard deviation of the experimental group are 76.1333 and 8.48416 and the control group are 71.0000 and 9.69536.

For the sake of investigating the effect of the treatment (metacognition teaching) on achievement motivation and academic motivation, due to having two dependent variables (achievement motivation and academic motivation) and the correlation between these two variables, MANCOVA was used.

To answer the research question, the researcher chose Wilks' Lambda out of the four statistics of Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root.

Table 2. Multivariate analysis on achievement motivation and achievement motivation scores, considering experimental and control groups as dependent variables according to Wilks' Lambda statistic.

Indicator variable	value	F	df	df error	sig
Group	0.125	87.382	2.000	25.000	0.0001

As it is demonstrated in table 2, $p < 0.000$ and $F = 87.382$. As a result, it can be mentioned that Wilks' Lambda statistic proves that the similarity hypothesis of the population averages based on dependent variables is rejected.

Table 3. The results of MANCOVA analysis, the effect of metacognition teaching on improving academic achievement and achievement motivation of students

Source of variation	Variable	SS	df	MS	F	sig	Eta	S. power
Pre-test	academic achievement	0.190	1	0.190	1.52	0.22	0.05	0.22
	motivation	0.044	1	0.044	0.007	0.93	0.001	0.05
Group	academic achievement	6.913	1	6.913	55.53	0.0001	0.68	1
	motivation	161.211	1	161.211	25.73	0.0001	0.49	0.99

As the results of table 3 illustrate, by omitting the effect of pre-test scores, there is a significant difference ($p \leq 0.0001$) between the mean of the scores of participants' academic achievement and achievement motivation in terms of group membership (experimental and control); therefore, this hypothesis is verified. The impact value has been 0.68 and 0.49, respectively. In other words, 68 per cent variance of academic achievement and 49 per cent variance of academic motivation are explained by metacognition activities. The statistical power of 1.00 and 0.99 show that provided that this research is repeated for 100 times, there is no possibility of verifying the null

hypothesis. That is to say, the test accuracy was so high in discovering the distinctions that proves the sufficiency of sample.

DISCUSSION

Examining the results, we showed that both groups' conditions are relatively similar in pre-test stage and there is no meaningful difference in GPA of the first semester and achievement motivation of the students.

The first hypothesis of this study, concerning the positive effect of teaching metacognitive strategies on achievement motivation of blind students, has been confirmed which is consistent with the results of conducted studies by the MCelland et al. [12]. This shows that the group with high achievement motivation had much better performance than the group with low achievement motivation. Franken [13] also found that learners with high achievement motivation have better performance on tests and examinations.

Regarding the second hypothesis of this study on the positive effect of teaching metacognitive strategies on academic achievement of blind students, it has also been confirmed and accords with the results of Gardner's studies [8], he who has argued that strategic behavior increases learning. Flavell [6], demonstrated that weak students often do not get involved in metacognitive activities. Ehteshami Tabar [14]; proved that there is a meaningful and positive correlation between making use of metacognitive strategies and academic performance of students. Likewise, Karami [15] declares that students' academic achievement can be predicted through scores of learning and studying strategies.

The outcomes of this study have shown that there is a meaningful difference between the second semester GPA (post-test) of the experimental group and the second semester GPA of the control group and students of the experimental group have higher GPA. Furthermore, the meaningful relationship between metacognitive strategies and achievement motivation as well as the meaningful relationship between metacognitive strategies and academic achievement is confirmed.

Considering the fact that not only metacognitive skills and strategies are highly effective in learning and academic achievement, but also these skills can be taught by teachers and learned by students, it is necessary to teach metacognitive learning and studying strategies, so that students (especially the blind) can develop their awareness of them and can monitor their learning process. As these students have had less treatments such as these strategies, they have to be instructed more to reach the necessary motivation for continuing learning and accomplishing higher academic achievement by intrinsic reinforcement and awareness.

As a consequence, paying attention to how students learn and study, the propitious correction of the teacher and attending various effective factors in learning, that one of them is achievement motivation, could be effectual for students to benefit learning opportunities. Especially, because of sensory impairment of blind students and the resulted problems, the importance and necessity of the above-mentioned issues grows.

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