
A Metacognition Study: Relationship with Students' Academic Achievement"

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ABSTRACT

Metacognitive knowledge includes knowledge about one's ability to understand, control, and manipulate one's cognitive processes. It includes knowing when and where to use particular strategies for learning and problem solving as well as how and why to use specific strategies. This research article briefly describes the metacognition of college students with regard to gender and relationship between metacognition and academic achievement. In order to study the problem, the survey method was used to collect the data. The sample for the study was collected from the three degree colleges of Sonipat city (Haryana). 80 students (40 male and 40 female) were randomly selected only from 1st year form all discipline. Score obtained in class 12th by the selected students, divided in two groups i.e. high scorer (above 65%) and low scorer (below 65%) were recorded for testing their level of Academic Achievement. Metacognitive inventory developed by Govil P. (2003) was administered to the selected sample to assess metacognition. The data so collected was analyzed statistically by employing Mean, SD and t-test. The finding reveals that the level of metacognition of most of the female students is found to be higher than male students. The research reveals that there is significant difference between male and female students in their metacognition but there is no significant difference in metacognition and academic achievement of high and low scorer. Moreover to this the academic achievement is less affected by metacognition means results found a low degree of correlation between both.

INTRODUCTION

With the rapid development of information diffusion technologies, students can acquire new knowledge with ease. However, in face of diverse e-learning environments, how they can choose useful information and monitor their self-learning process is an issue that educators should pay attention to. Metacognition includes- a) Regulation of cognition, includes all those mechanisms through which we regulate our thinking process, such as orientation, planning, monitoring, testing, repairing, evaluating etc. and b) Knowledge of cognition deals with all the concept, which are related to our thinking processes such as self- concept of knowledge, self intelligence, self memory, attention, study habits etc.

Metacognition is awareness and management of one's own thought. (Kuhn & Dean, 2004) Metacognition plays an important role in communication, reading comprehension, language acquisition, social cognition, attention, self-control, memory, self-instruction, writing, problem solving, and personality development (Flavell, 1979). Wang, Haertel, and Walberg (1990) discovered that metacognition ranks first among the 200 some factors affecting schooling outcomes. They pointed out that metacognitive skills is the ability to associate important messages with prior knowledge, draw inferences, and monitor or assess personal performance demonstrated in the reading process. Flavell (1979) research yielded two key concepts: metacognitive knowledge and metacognitive experience. A person may have metacognitive knowledge of some factors that affect his/her learning (these factors may relate to beliefs about oneself as a learning creature, the learning task, or the strategies engaged to achieve the learning goal). Simultaneously one may have metacognitive experiences that can be explained as conscious thoughts or feelings about the learning process the very moment this occurs. Pintrich (1994) defines academic metacognition as a

construct comprised of three major elements: (a) active control over learning-related behaviors such as when, how much, and with whom a student is learning; (b) self-regulation of motivation and affect, in which students learn how to control their emotions and even use them in goal setting; (c) control over various cognitive strategies for learning, such as rehearsal and memory strategies. More precisely, it refers to the processes used to plan, monitor, and assess one's understanding and performance. Metacognition includes a critical awareness of a) one's thinking and learning and b) oneself as a thinker and learner. Metacognitive practices increase students' abilities to transfer or adapt their learning to new contexts and tasks (Bransford, Brown, & Cocking, 2000; Palincsar & Brown, 1984). They do this by gaining a level of awareness above the subject matter. Brown (1987) also commented that metacognition was seen by many as a blanket term under which many cognitive and other non metacognitive phenomena could be hidden. It is a special type of knowledge and ability that develops with personal experience and with schooling. It is in a recursive loop with cognitive development in that it both produces and is a product of cognitive development. (Paris and Winograd, 1990). Further, Schraw (1998) describes metacognition as a multidimensional set of general, rather than domain-specific, skills. These skills are empirically distinct from general intelligence, and may even help to compensate for deficits in general intelligence and/or prior knowledge on a subject during problem solving.

Hacker's (1998) definition is considered to sum up efficiently the core meaning of metacognition as viewed in this paper: "It is the knowledge of one's knowledge, processes and cognitive and affective states; and the ability to consciously and deliberately monitor and regulate one's knowledge, processes and cognitive and affective states". In addition, several studies have shown that meta-cognition is not a set of idiosyncratic behaviors but a finite set of common skills that are highly correlated to academic success (Garcia & Pintrich, 1994; Pintrich, 1994). There is also ample evidence that metacognition can guide further cognitive development (Kuhn, 2000). Those who know their strengths and weaknesses in these areas will be more likely to "actively monitor their learning strategies and resources and assess their readiness for particular tasks and performances" (Bransford, Brown, & Cocking, p. 67). Metacognition is "not generic" (Bransford, Brown, & Cocking, 2000) but instead is most effective when it is adapted to reflect the specific learning contexts of a specific topic, course, or discipline (Zohar & David, 2009).

A variety of studies have examined the influence of metacognitive skills on adult performance. Metacognitive practices help students become aware of their strengths and weaknesses as learners, writers, readers, test-takers, group members, etc. The effective use of metacognition has been shown to predict learning performance (Pintrich & DeGroot, 1990). Students with higher metacognitive skills outperformed those with lower metacognitive skills in problem-solving tasks, regardless of their overall aptitude. Research has consistently shown that students who are high achievers in academic learning domains such as reading, writing, math and science also exhibit higher levels of metacognitive knowledge about that domain, and have developed greater abilities in self-regulation (Baker & Cerro, 2000). Therefore educational institutions and the instructors are in need to prepare students to enable the metacognition while teaching any subject, which helps the learners to solve the concern problems. In this context it is imperative to assess the metacognition students.

SIGNIFICANCE OF THE STUDY

Academic achievement is a very complex variable and it is affected by many variables like achievement goals, interest, motivation, knowledge of learning style, parents support, financial situation etc. Research indicates that knowledge about meta-cognition may help the stakeholders to improve the quality and outcome of education. Therefore, the results of the study may help us to have a clearer understanding of correlation between metacognition and academic achievement.

OBJECTIVES of THE STUDY

1. To find out the level of metcognition of college students.
2. To find whether there is any significant difference between college students in their metacognition with regard to their gender.
3. To find whether there is any significant difference between metacognition Level of high and low achievers college students.
4. To find whether there is any significant correlation between metacognition and academic achievement.

HYPOTHESES

1. There is no significant difference between college students in their metacognition with regard to their gender.
2. There is no significant difference between metacognition Level of high and low achiever college students.
3. There is no significant correlation between metacognition and academic achievement.

METHODOLOGY

The researcher used the survey method for the present study. For data collection, the investigator used the “Metacognitive inventory” which comprises of 30 items, developed by Govil P. (2003). For the purpose of the present study, random technique was used and 80 students (40 male and 40 female) students enrolled in 1st year form all disciplinewere randomly selected from three degree colleges of Sonipat city (Haryana).

Score obtained in class 12th by the selected students,divided in two groups i.e. high scorer(above 65%) and low scorer (below 65%) were recorded for testing their level of Academic Achievement. The data were analyzed by using Mean, Standard Deviation and t-test.

ANALYSIS OF DATA

The data were subjected to statistical treatment leading to the findings which may satisfy the requirements of the objectives of the study.

Table 1

Level of metacognition of college students with regard to gender and Academic Achievement

Variables		N	Very Low	Low	Average	High	Very High
Gender	Male	40	5%	7.5 %	60 %	27.5%	0 %
	Female	40	0 %	15 %	37.5 %	40 %	7.5 %
Academic Achievement In Class 12 th (Male & Female)	High Scorer*	44 (21M+23 F)	0 %	11.4 %	47.7 %	36.4%	4.5 %
	Low Scorer*	36 (19M+17 F)	5.6 %	11.1 %	50 %	30.6%	2.7 %

*High Scorer = Score Above 65%

*M= Male

*Low Scorer= Score Below 65%

*F= Female

It is inferred from the above table that:-

- The metacognition level in most of the females is higher whereas it's found Average level in majority of Males.
- The majority of the students have average level of metacognition irrespective to their Academic Achievement.

Table 2

Shows the mean, standard deviation and t- ratio for testing the significant difference in male and female students

Gender	N	Mean	S.D	S _{Ed}	t-value	Level of Significance
Male	40	86.829	10.722	2.261	2.121	Sig.
Female	40	91.625	9.469			

It is inferred from the above table that:-

- There is a significant difference between male and female students in their metacognition level.
- A close look of table clearly reveals that mean value of metacognition of female students is higher than male students.

So the hypothesis, "There is no significant difference between college students in their metacognition with regard to their gender" is Rejected.

Table 3

Shows the mean, standard deviation and t- ratio for testing the significant difference in high and low Achieversstudents

Level of Achievement	N	Mean	S.D	S _{Ed}	t-value	Level of Significance 0.05
High < 65 %	44	91.477	8.785	2.333	1.585	Not sig.
Low > 65 %	36	87.777	11.531			

It is inferred from the above table that:-There is no significant difference between higher and low achieverstudents in their metacognition level. A close look of table clearly reveals that mean ofstudents with high achievement level is greater than low achievement level students but the difference in both the group is not significant.

So the hypothesis, “There is no significant difference between metacognition level of high and low achiever college students” is accepted

Table 4

Shows the variables, N, Correlation and df for testing the significant correlation between Meta-cognition and Academic Achievement (AA)

Variables	N	Pearson Correlation (r)	df	Level of Significance 0.05
12 class % and Metacognition level	80	0.1074	78	Not sig.

The table reveals that the there:- is low degree of correlation found between Meta-cognition and Academic Achievement and with 78 degree of freedom, correlation found no significant relationship, at 0.05 level of significance so that null hypothesis “There is no significant correlation between metacognition and academic achievement” is accepted.

FINDINGS OF THE STUDY

The major findings derived from the study are:

1. The level of metacognition is found to be average with regard to gender and their discipline. Female students found to be little better than male students in their metacognition.
2. There is a significant difference between male and female college students in their metacognition. After comparing the mean scores of male and female students, female students are better than male students in their metacognition.
3. There is no significant difference between metacognition Level of high and low achiever college students. While comparing the mean scores, students with high achievement level have slightly better metacognition than low achievement level students.
4. There is no significant correlation between metacognition and academic achievement. The result shows a low degree of correlation between both. So the academic achievement of students is less influence by their metacognition but more influenced by the other factors like level of intelligence, interest, goals, motivation level, parents and teacher support etc.

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