



METACOGNITION AND ITS CORRELATES: A STUDY

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ABSTRACT: The present study attempts to investigate correlates of metacognition of undergraduate students. The study explored the relationship of metacognition of undergraduate students with demographic variables like gender, place of living, academic achievement and parents' education. The study was conducted on the sample of 313 undergraduate students of Aligarh District. The metacognitive inventory (MCI) developed by Dr. Punita Govil (1) has been used as a measure of metacognition of students. 't' test and analysis of variance have been employed to analyze the data. The findings of the study reveal that gender has no significant impact on the metacognition of undergraduate students on the other hand the metacognitive level of urban students differs significantly from their rural counterparts. The high and low achieving undergraduate students differ significantly on their metacognitive level. Moreover, fathers' educational qualification found to have no significant impact on metacognition of the students under study while mothers' education has significant impact on it. This study suggests learners to understand and regulate their own thinking process to resolve the real life complexities. Further the present study also recommends some strategies for parents and teachers to facilitate learning among students at college level.

KEYWORDS: Metacognition, Academic achievement and parental education

1. INTRODUCTION: Since education at under graduation level is the first terminal stage of education, students are expected to come out as adults with discernible learning outcomes in the form of competencies at the end of the course. The present educational system is aimed at, besides providing knowledge to the learner, to teach them 'learning how to learn', to organize their thinking processes to solve different problems and to develop competencies to meet future challenges.

In the context of present education system, a student needs to acquire information, application of knowledge, judging ability, critical thinking, analytical skills, problem solving, creativity and innovative attitude, aptitude for research, quantitative ability, multidisciplinary knowledge, computer skills, communication skills, soft skills, leadership, working in a team, positive attitudes, broader world view etc. A student develops these competencies and skills in an institution, through the curricular, co-curricular and extra-curricular activities.

Sometimes students experience difficulties in acquiring these competencies and behaviors due to their inability to make use of knowledge and skills and take control of their learning. This inability to self-regulate their learning and behavior often results in poor academic performance along with difficulties in social interaction. Lindner and Harris (2) suggested that the self-regulated learner is "organized, autonomous, self-motivated, self-monitoring, self-instructing, in short, behaves in ways designed to maximize the efficiency and productivity of the learning process". Thus a careful guidance in recognizing and regulating one's own thinking processes may help learners to solve problems of their lives. Instead of telling them the solution of a particular problem it will be better to equip them with the knowledge to have a practical assessment of their own skills and cognitive processes which may enable them not only to solve the present problem but the problems throughout their lives. This concept of self-regulating of behavior is known as 'metacognition'. The following paragraphs describe the concept of metacognition in detail.

1.1. METACOGNITION: The above description delineates about metacognition, learning strategies, which is of the interest of students, educators and career counselors today. Flavell (3) describes meta-cognition as "knowledge and cognition about cognitive phenomena". According to him, a person's ability to control "a wide variety of cognitive enterprises occurs through the action and interactions among four classes of phenomenon: a) metacognitive knowledge b) metacognitive experiences c) goals or tasks and d) actions or strategies". In other words an individual with his metacognitive knowledge undergoes metacognitive experiences to meet the demands raised by the task, and applies suitable strategies for accomplishing the task to make progress towards the goals. Baker and Brown (4) decode metacognition into two categories: knowledge about cognition and regulation of cognition. Knowledge about cognition focuses on one's own awareness and appraisal of one's cognitive process; while regulation of cognition

takes into account self-regulation and strategies leading to the achievement of self-regulation. Applegate et al. (5) address metacognition as learners' knowledge and use of their own cognitive resources. A recent definition describes metacognition as "one's knowledge and beliefs about one's own cognitive processes and one's resulting attempts to regulate those cognitive processes to maximize learning and memory" (6).

1.1.1. IMPORTANCE OF METACOGNITION: 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 (3). Metacognition is a special type of knowledge and ability that develops with personal experience and with schooling.

The use of metacognition appears to be related to academic achievement and enhanced learning outcomes [(7) – (9)]. Use of metacognitive strategies may be linked to efficient ways to improve performance in academic and work environments. For example, young adults in college regulate their learning behavior with a variety of specific strategies. They manage their own time, decide with whom to study, and monitor their comprehension with a variety of internal (self-regulation, strategies) and external (peers, family, faculty) supports. Watkins and Hattie (10) reported that high academic achieving students are more likely to utilize strategies congruent with their motivational states. Academic success and level of achievement are related to students' degree of self-regulation. Students seem to acquire metacognitive or learning strategies that are perceived under their control that will positively or negatively affect their academic success and level of achievement. Biggs (11) and Bondy (12) suggested that the capacity to understand and apply metacognitive knowledge and strategies varies with age. In addition, several studies have shown that metacognition is not a set of idiosyncratic behaviors but a finite set of common skills that are highly correlated to academic success (13). In a study Peklaj and Pecjak (14) found that metacognitive knowledge increased from low to high achieving students. Sperling et al. (15) investigated the relationship between achievement and metacognition. The significant correlations between the achievement and metacognition were found for grades 3rd to 5th. The investigator also examined the effects of gender on the two dimensions of the metacognitive skills (knowledge of cognition and regulation of cognition) but could not observe any gender differences in these two dimensions of metacognitive skills. Zimmerman (16) concluded that metacognitive or learning strategies that are perceived under students' control will positively or negatively affect their academic success and level of achievement. Annevirta and Vauras (17) stated that children's ability to regulate their performance is influenced by environmental variables, social interaction, child's own regulatory skills and adult's role in problem solving processes. They emphasized that in order to accurately measure young children's metacognition researchers need to consider the effects of those variables. Findings of this study supported that environmental variable such as going to schools in urban setting, social interaction with parents, and parents' educational level were significantly influenced the young students' metacognition. The present investigation aims to find out the effect of certain demographic variables such as gender, place of living, academic achievement and parents' education level on the metacognition level of undergraduate students.

2. OBJECTIVES OF THE STUDY: The objectives of this study are as follows:

1. To investigate the significance of the difference between metacognitive level of male and female undergraduate students.
2. To study the difference in the level of metacognition of undergraduate students living in rural and urban areas.
3. To find out the difference of the metacognition level between high and low achievers at undergraduate level.
4. To study the difference of metacognitive level of undergraduate students whose parents are either illiterate, primary educated, secondary educated or university educated.

3. METHODOLOGY:

3.1. POPULATION AND SAMPLE: The present investigation is based on the population of under-graduate students. So the aggregate of all the students who have passed 12th class and have enrolled themselves in the first year B.A., B.Sc., and B.Com. in different colleges/universities of Aligarh district, constitute the population of this study. Simple random sampling technique was employed to collect the data. The study was conducted on the sample of 313 undergraduate students.

3.1.1. TOOLS: METACOGNITIVE INVENTORY (MCI): To measure the metacognitive aspect of the sample the investigator used the Metacognitive Inventory developed by Govil (1). This inventory includes 30 items dealing with both aspects of metacognition i.e., knowledge of cognitive process and regulation of cognitive process. The value of reliability coefficient was found to be 0.82 for the inventory.

3.1.1.1. PERSONAL DATA SHEET: For other information i.e. gender, place of living, academic achievement scores (12th grade), parents' education separately for father and mother indicating their level of educational qualification i.e. illiterate, primary educated, secondary educated, university educated, a personal data sheet had been developed and required entries were filled up by the respondents.

3.1.1.2. DATA PROCESSING: After collecting the data, the results were drawn with the help of SPSS. The analysis was conducted at two levels. At the first level, basic statistics like measures of central tendencies were computed. At

the second level, significance of difference between means was computed. The following tables and subsequent interpretation presents a detailed description of the analysis.

4. RESULTS AND DISCUSSION:

Variables	Groups	N	Mean	S.D.	t-value	Level of Significance
Gender	Male	162	91.98	8.59	1.06	Not Significant
	Female	151	93.04	9.11		
Place of Living	Rural	143	91.14	7.83	2.50	0.01 level
	Urban	170	93.62	9.49		
Academic Achievement	High Achievers	140	95.58	6.84	5.86	0.01 level
	Low Achievers	173	89.98	9.49		

Table I: Descriptive statistics of metacognitive level of undergraduate students based on gender, place of living and academic achievement

The table 1 and its corresponding figure (I) depicts that the mean score of female undergraduate students (93.04) is higher than the mean score (91.98) of their male counterparts on the variable of metacognition. It is clear by the 't' value (1.06) that the difference between these two mean scores is not significant indicating that gender has no significant effect on the metacognitive level of undergraduate students. However, the difference between the mean scores of rural and urban students has been found significant at 0.01 level as shown by the 't' value (2.50).

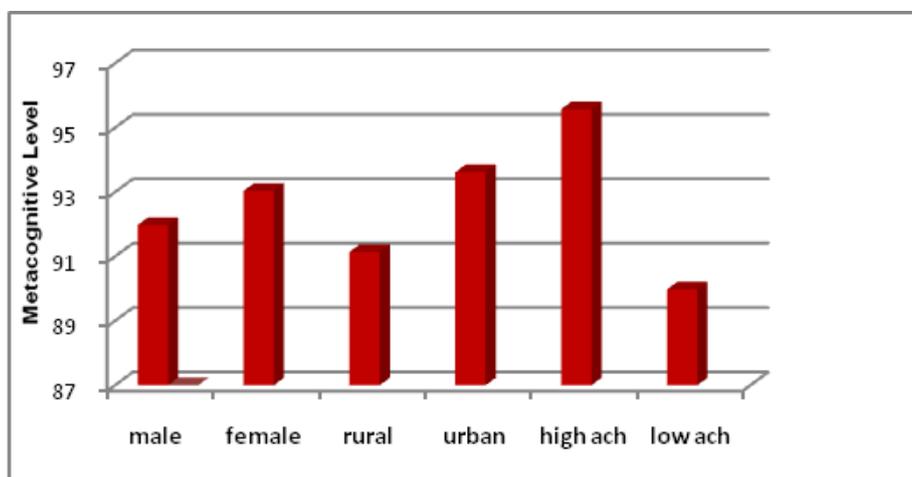


Figure I: Distribution of mean scores on metacognitive level of undergraduate students based on gender, place of living and academic achievement

This result may be due to greater exposure of the college students to self awareness skills as compared to those living in rural areas. Urbanization makes them aware about concurrent challenges and opportunities on the other hand in rural areas opportunities are still limited. So far as relationship of metacognition and academic achievement is concerned, the above result shows that high achievers' metacognition level is significantly higher than their counterparts. The obtained 't' value i.e. 5.86 confirms this difference to be significant at 0.01 level. This may be because high achievers use metacognitive strategies linked to efficient ways of improving performance in academics and work environment. They may regulate their learning behavior with a variety of specific strategies by managing their own time etc. The above results are in coordination with the findings of the studies conducted by Peklaj and Pecjak (14), Sperling et al. (15), Annevirta and Vauras (17) etc.

Groups	N	Mean	S.D.	F-value	Level of Significance
Illiterate	36	91.42	10.44	.283	.838 (not significant)
Primary Education	46	92.28	8.46		
Secondary education	97	92.41	8.53		
University Education	134	92.90	8.81		

Table II: - Descriptive statistics of metcognitive level of undergraduate students in relation to their fathers’ educational qualification

It is clear from the table II that the mean score of students whose fathers’ are illiterate is 91.42 with S.D. 10.44 while mean scores of students for primary educated, secondary educated and university educated fathers’ are 92.28, 92.41 and 92.90 with S.D. 8.46, 8.53 and 8.81 respectively. The ‘f’ value computed to compare these means is 0.283 indicating no significant difference in the metacognitive level of the undergraduate students on the basis of their fathers’ educational level (i.e. illiterate, primary educated, secondary educated or university educated). This finding indicates that fathers’ educational qualification does not contribute significantly to the metacognition of their wards. The figure II given below also depicts mean values of metcognitive level of undergraduate students in relation to their fathers’ educational qualification. These findings may be due to the fact that fathers, generally, pay less attention to the studies of their children. Moreover, interaction and communication of students with their fathers is comparatively less in comparison to mothers. It may be the cause of less understanding among them.

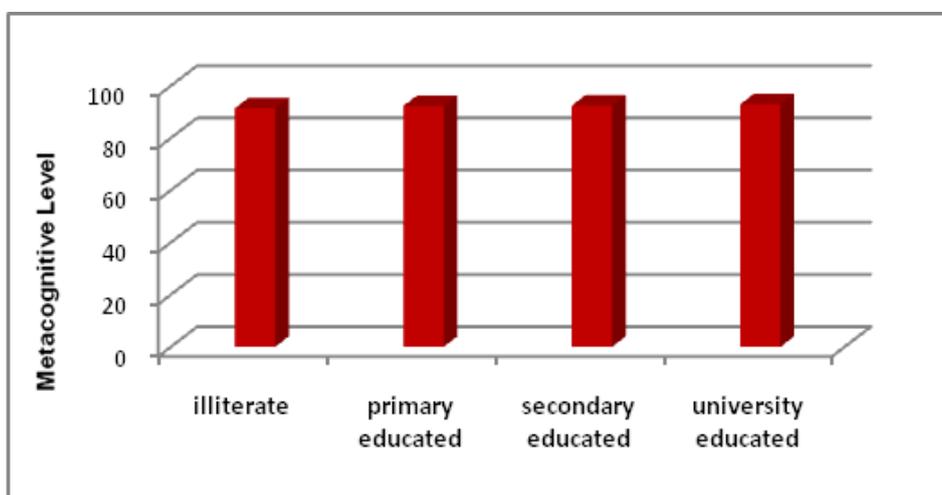


Figure II: Distribution of mean scores on metcognitive level of undergraduate students based on fathers’ educational qualification

Groups	N	Mean	S.D.	F-value	Level of Significance
Illiterate	98	92.17	10.27	3.668	.013 (significant)
Primary Education	39	88.71	6.54		
Secondary education	95	92.82	7.60		
University Education	81	94.30	8.87		

Table III: - Descriptive statistics of metcognitive level of students on the basis of their mothers’ educational qualification

As shown in the above table the mean scores of students’ metacognition in relation to their mothers’ educational qualification are 92.17, 88.71, 92.82 and 94.30 with standard deviation 10.27, 6.54, 7.60 and 8.87 for illiterate, primary educated, secondary educated and university educated respectively. These mean scores were compared to know the significance of difference among them. The ‘F’ ratio found for this difference is 3.668, which is significant at 0.01 level. The figure III given below also describes the difference in the mean values.

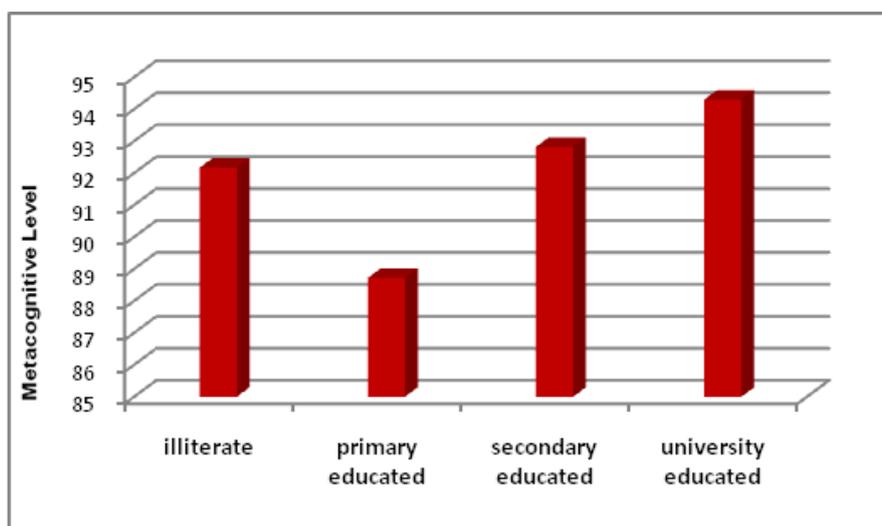


Figure III: Distribution of mean scores on metcognitive level of undergraduate students based on mothers' educational qualification

On the basis of these findings it may be concluded that mothers' educational qualification significantly affect the metacognition of undergraduate students. The students whose mothers were highly educated were having better metacognition than those whose mothers were less educated. Surprisingly students whose mothers are illiterate also have high metacognitive level than those whose mothers are primary educated. This finding may because of the fact that mothers are more devoted for their family in general and for the education of their children in particular. They are more concerned about the studies of their wards and if they are educated and aware enough they may contribute much to develop overall personality of their children and it will significantly improve the metacognitive level of their young ones. The above findings are in co-ordination with the studies of Annevirta and Vauras (17); Mustafa and Ozgul (18) who concluded that parental education level is positively correlated with metacognition of their children.

CONCLUSION: The findings of the present study reveal that developing metacognitive strategies is important for reaching the goals of learning. Promoting metacognitive awareness and skills could be a valuable method for improving learning and performance at all ages. Teachers can play a very significant role in this regard. National Curriculum Framework, 2005 (19) emphasizes constructivist approach towards the teaching learning processes. This approach emphasizes that learning is not simply an activity, which can be taught to the learner. The learner learns or rather constructs his knowledge through experiences, therefore, the task of the teacher is to provide rich and authentic problem-solving environment. So that, the learner, while solving the problem may construct his gamut of learning. According to Jean Piaget the learner is the constructor of his own knowledge through processes of accommodation and assimilation. He constructs his own world of knowledge. The task of the teacher is to provide a variety of experiences to the learner. If a learner is well acquainted with his own concept of knowledge i.e. existing knowledge, acquiring knowledge, study habits etc. along with the regulation of his cognitive processes, he can achieve success. Parents and the family environment influence the behavior and decisions taken by adolescents. There is also a wealth of evidence on the positive relationship between parental education, especially mother's education, and offspring's education. Thus, parents of students at every level may play a very crucial role in enhancing the metacognitive level of their wards by promoting strategies to construct and regulate their knowledge. In this way our youth may become ready to face and resolve the upcoming challenges and complexities of real life.

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