"Metacognitive Reading Strategies and Its Relationship with English Achievement of IX Standard Students of Raipur City"

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ABSTRACT: *This paper focuses on study of Metacognitive Reading Strategy in relation to English achievement. The research was carried out in Raipur city on a sample of 456 IX standard students. Metacognitive Awareness of Reading Strategies Inventory (MARSI) by Kouider Mokhtari and Carla Reichard was used for the present study. The research findings revealed that there is positive and high relationship between Global Reading Strategy, Problem Solving strategy, Support Reading Strategy and English Achievement of students. It is also found that there is significant difference between Metacognitive Reading Strategies of Boys and Girls but there is no significant difference between Global Reading Strategy of Boys and Girls. It is also found that there is significant difference between Problem Solving Strategy and Support Reading Strategy of Boys and Girls.*
Keywords: Metacognition, Metacognitive strategies, Achievement in English

I. INTRODUCTION

Metacognition is a method of higher thinking or "Thinking about thinking". In the process of metacognition activities such as planning how to approach a learning task, monitoring comprehension and evaluating the progress are involved. Metacognition is used by people in their everyday basis. For example after reading a paragraph or page the reader may ask himself questions about the text. If the reader can not answer his questions then he must go back and reread the text for better understanding. A recent definition describe metacognition as ―One's knowledge and beliefs about one's own cognitive process and one's resuting attempts to regulate these cognitive process to maximize learning and memory."

Metacognition includes knowledge and regulation of one's thinking process. It plays an important role in communication, reading comprehension, writing, problem solving and personality development. Though related, cognition and metacognition differ. Cognitive skills are those needed to perform a task whereas metacogntive skills are necessary to understand how it was performed. Successful adult learners employ a range of metacognitive skills, and effective teachers of adults attend to the development of these skills.

Meaning of Metacognition:-
Metacognition is an important part of intentional learning, since it involves actively thinking about what you know, what you don't know, and how you can get better at knowing and applying what you know. Metacognition is defined as "cognition about cognition", or "knowing about knowing." It can take many forms; it includes knowledge about when and how to use particular strategies for learning or for problem solving.

- **J. H. Flavell** first used the word "metacognition". He describes it in these words:
  Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them, e.g., the learning-relevant properties of information or data.‖ For example, I am engaging in metacognition if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact.
- Metacognition refers to learners' automatic awareness of their own knowledge and their ability to understand, control, and manipulate their own cognitive processes.
- Metacognition refers to a level of thinking that involves active control over the process of thinking that is used in learning situations. Planning the way to approach a learning task, monitoring comprehension, and evaluating the progress towards the completion of a task: these are skills that are metacognitive in their nature.
- Different fields define metacognition very differently. Metacognition variously refers to the study of memory-monitoring and self-regulation, consciousness/awareness and auto-consciousness/self-awareness. In practice these capacities are used to regulate one's own cognition, to maximize one's potential to think, learn and to the evaluation of proper ethical/moral rules.

Metacognition is classified into three components:
1. **Metacognitive knowledge** (also called metacognitive awareness) is what individuals know about themselves and others as cognitive processors.
2. **Metacognitive regulation** is the regulation of cognition and learning experiences through a set of activities that help people control their learning.
3. **Metacognitive experiences** are those experiences that have something to do with the current, on-going cognitive endeavor.

Metacognition is a relatively new field, and theorists have not yet settled on conventional terminology. However, most metacognitive research falls within the following categories:

1) *Metamemory*:- This refers to the learners' awareness of and knowledge about their own memory systems and strategies for using their memories effectively. Metamemory includes (a) awareness of different memory strategies, (b) knowledge of which strategy to use for a particular memory task, and (c) knowledge of how to use a given memory strategy most effectively.

2) *Metacomprehension*: - This term refers to the learners' ability to monitor the degree to which they understand information being communicated to them, to recognize failures to comprehend, and to employ repair strategies when failures are identified. Learners with poor metacomprehension skills often finish reading passages without even knowing that they have not understood them. On the other hand, learners who are more adept at metacomprehension will check for confusion or inconsistency, and undertake a corrective strategy, such as rereading, relating different parts of the passage to one another, looking for topic sentences or summary paragraphs, or relating the current information to prior knowledge.

3) *Self-Regulation*:- This term refers to the learners' ability to make adjustments in their own learning processes in response to their perception of feedback regarding their current status of learning. The concept of self-regulation overlaps heavily with the preceding two terms; its focus is on the ability of the learners themselves to monitor their own learning (without external stimuli or persuasion) and to maintain the attitudes necessary to invoke and employ these strategies on their own. To learn most effectively, students should not only understand what strategies are available and the purposes these strategies will serve, but also become capable of adequately selecting, employing, monitoring, and evaluating their use of these strategies

- **Metacognitive Strategies:-**

    Metacognitive-like processes are especially ubiquitous when it comes to the discussion of self-regulated learning. Being engaged in metacognition is a salient feature of good self-regulated learners. Groups reinforcing collective discussion of metacognition are a salient feature of self-critical and self-regulating social groups. The activities of strategy selection and application include those concerned with an ongoing attempt to plan, check, monitor, select, revise, evaluate, etc. Metacognition is 'stable' in that learners' initial decisions derive from the pertinent fact about their cognition through years of learning experience. Simultaneously, it is also 'situated' in the sense that it depends on learners' familiarity with the task, motivation, emotion, and so forth. Individuals need to regulate their thoughts about the strategy they are using and adjust it based on the situation to which the strategy is being applied. At a professional level, this has led to emphasis on the development of reflective practice, particularly in the education and health-care professions.

II. SIGNIFICANCE OF THE STUDY

Metacognitive skills are important not only in school, but throughout life. For example, Mumford (1986) says that it is essential that an effective manager be a person who has learned to learn. He describes this person as one who knows the stages in the process of learning and understands his or her own preferred approaches to it - a person who can identify and overcome blocks to learning and can bring learning from off-the-job learning to on-the-job situations.

If students are taught metacognitive awareness concerning the purpose and usefulness of a strategy as they are taught the strategy, they are more likely to generalize the strategy to new situations. Given the importance of high-stakes accountability and the use of standards, it is imperative to teach metacognitive skills in the ABLE classroom.

We engage in metacognitive activities everyday - being aware of and monitoring our learning. In addition to its obvious cognitive components, metacognition often has important affective or personality components. For example, an important part of comprehension is approaching a reading task with the attitude that the topic is important and worth comprehending. Being aware of the importance of a positive attitude and deliberately fostering such an attitude is an example of a metacognitive skill.

Learners with good metacognitive skills are able to monitor and direct their own learning processes. Like many other processes, metacognitive skills are learned by applying principles. When learning a

metacognitive skill, learners typically go through the following steps: - (Pressley, Borkowski, & Schneider, 1987):

1. They establish a motivation to learn a metacognitive process. This occurs when either they themselves or someone else points gives them reason to believe that there would be some benefit to knowing how to apply the process.
2. They focus their attention on what it is that they or someone else does that is metacognitively useful. This proper focusing of attention puts the necessary information into working memory. Sometimes this focusing of attention can occur through modeling, and sometimes it occurs during personal experience.
3. They talk to themselves about the metacognitive process. This talk can arise during their interactions with others, but it is their talk to themselves that is essential. This self talk serves several purposes:
o It enables them to understand and encode the process.
o It enables them to practice the process.
o It enables them to obtain feedback and to make adjustments regarding their effective use of the process.
o It enables them to transfer the process to new situations beyond those in which it has already been used.
4. Eventually, they begin to use the process without even being aware that they are doing

so.

This process usually represents a high-level implementation of the phases of learning and instruction described by Gagne. When teachers intervene to help students develop a metacognitive process, they often use the scaffolded instruction strategies. In addition, the techniques of cooperative learning and peer tutoring often provide opportunities for students to talk to others about their thought processes; and it is often the process of formulating thoughts in order to express them to others that leads to metacognitive development .

III. REVIEW OF RELATED LITERATURE

A variety of studies have examined the influence of metacognitive skills on adult performance. Everson and Tobias (2001) report that research shows there is a difference in the metacognition of effective learners and ineffective learners. 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. In a study comparing self-regulated learning in college undergraduates and graduate students (Lindner, Harris, and Gordon, 1996), research showed a strong correlation between metacognition and degree completion. 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). Studies of adults in the work force have also shown a positive influence of metacognition on performance. Nurses and electronics technicians considered excellent at their jobs were found to have greater metacognitive awareness and strategy use than workers who were average performers (Baker, 1989).

1)Metacognitive Development in Professional Educators; Susan Sunny Cooper, Penée W. Stewart, Weber State University.
Paper presented at the annual meeting of the Northern Rocky Mountain Educational Research Association, Jackson Hole, Wyoming, and October 2005 and at the annual convention of the American Educational Research Association in San Francisco, April 2006. Results indicated that metacognition improves significantly with age and with years of teaching experience. Male and female respondents showed no significant difference in metacognition, and teachers of grades from preschool to post-secondary showed no significant difference in metacognition.

2) The relationship between goals, metacognition, and academic success; by Savia A. Coutinho; Northern Illinois University, United States of America.
This study examined the relationship between mastery goals, performance goals, metacognition, and academic success. Regression analyses revealed a partial mediation effect in the relationship between mastery goals and academic performance. Performance goals were unrelated to academic performance. This study supports research findings suggesting that students with mastery goals reap the rewards of academic success.

3)The Measurement and Predictive Ability of Metacognition in Middle School Learners; Sperling, Rayne A.; Richmond, Aaron S.; Ramsay, Crystal M.; Klapp, Michael; Journal of Educational Research, v105 n1 p1-7 2012.
Findings indicated expected significant correlations between 2 measures of metacognition, the Junior Metacognitive Awareness Inventory (Sperling, Howard, Miller, & Murphy, 2002) and an open-ended version of Swanson's (1990) metacognition measure and a significant correlation between the Swanson measure and

general science teacher ratings of students' metacognition. Student measures demonstrated sound psychometric properties and both were significant predictors of science achievement.

4)Assessing Metacognition in an Online Community of Inquiry; Akyol, Zehra; Garrison, D. Randy; Internet and Higher Education, v14 n3 p183-190 Jul 2011.

The purpose of this research is to develop and validate a metacognitive construct that provides the opportunity to assess metacognition in online discussions. Furthermore, the Community of Inquiry (COI) theoretical framework provided the conceptual coherence to construct, operationalize and interpret metacognition in an online collaborative inquiry. The results provided evidence of metacognition indicators in student discussion postings and the frequency of these indicators increased over time.

5) Training Metacognition in the Classroom: The Influence of Incentives and Feedback on Exam Predictions; Miller, Tyler M.; Geraci, Lisa; Metacognition and Learning, v6 n3 p303-314 Dec 2011.

Students' predictions were almost always higher than the grade they earned and this was particularly true for low-performing students. Experiment 1 demonstrated that providing incentives but minimal feedback failed to show improvement in students' metacognition or performance. However, Experiment 2 showed that when feedback was made more concrete, metacognition improved for low performing students although exam scores did not improve across exams, suggesting that feedback and incentives influenced metacognitive monitoring but not control.

6) Enhancement of Metacognition Use and Awareness by Means of a Collaborative Intervention; Sandi-Urena, Santiago; Cooper, Melanie M.; Stevens, Ron H; International Journal of Science Education, v33 n3 p323-340 Feb 2011.

Findings reveal that, compared to the control group, the treatment group showed a significant increase in metacognition awareness, as evidenced by the MCAI, increased ability in solving non-algorithmic chemistry problems of higher difficulty, and with higher per cent correctness (IMMEX). These findings are consistent with an overall increase in the use of regulatory metacognitive skills by the treatment group.

7) The Relationships and Impact of Teachers' Metacognitive Knowledge and Pedagogical Understandings of Metacognition ; Wilson, Nance S.; Bai, Haiyan; Metacognition and Learning, v5 n3 p269-288 Dec 2010

The data analysis results, using mixed research method, suggest that the participant's metacognitive knowledge had a significant impact on his/her pedagogical understanding of metacognition. The results revealed that teachers who have a rich understanding of metacognition report that teaching students to be metacognitive requires a complex understanding of both the concept of metacognition and metacognitive thinking strategies.

8)Explorations of Metacognition among Academically Talented Middle and High School Mathematics Students ; Young, Adena Elizabeth; ProQuest LLC, Ph.D. Dissertation, University of California, Berkeley.

Results of exploratory factor analysis indicated that scores on an existing metacognition questionnaire were structurally valid although they lacked concurrent and predictive validity. Metacognition as measured by the existing questionnaire was not significantly or meaningfully related to measures of academic achievement or problem solving metacognition. However, problem solving metacognition was related to both problem solving accuracy and students' diagnostic test score and summer course grade

9) Sixth Graders' Understanding of Their Own Learning: A Case Study in Environmental Education Course ; Pihlainen-Bednarik, Kaisa; Keinonen, Tuula ; International Journal of Environmental and Science Education, v6 n1 p59-78 Jan 2011. In this qualitative case study the metacognition of Finnish sixth graders (N = 19) was studied in a virtual learning environment, ENO--Environmental Online. Pupils' metacognitive knowledge and skills were studied in one ENO course. The aim was to describe what and how pupils monitor in their learning processes. It was found that 11-year-old sixth graders possessed declarative and procedural metacognition, and also some conditional metacognition. In this study, the social component of learning was especially emphasized.

10) A component analysis of metacognition in reading comprehension: The contributions of awareness and self-regulation ; Lawrence O'Shea, Dorothy O'Shea (1994); International Journal of Disability Development Education 41 (1) p. 15-32

Findings reveal that students trained to underline key words and phrases as they read a passage answered more comprehension (COMP) questions on an acquisition probe and recalled more propositions on acquisition and generalization probes. Although cuing students to the purpose of reading was beneficial, the combination of awareness of purpose and employment of a self-regulated strategy generated better (COMP) performance.

11) Aspects of linguistic awareness in reading comprehension; Ellen Bialystok (1988)**;** Applied Psycho Linguistics 9 (2) p. 123-139

A study was conducted in which 159; 8-yr-olds were tested with these metalinguistic tasks, general measures of intelligence, and a test of reading comprehension. Results show that the relation among performance on the metalinguistic tasks was strongest for those tasks relying on the same processing skill component and that one of these components was most significant in determining the child's level of reading comprehension.

12) Assessment of metacognition and its relationship with reading comprehension, achievement, and aptitude ; Pelin Çetinkaya, Emine Erktin (2002) *;*Bogaziçi University Journal of Education 19 (1) p. 1-11
The results showed that the awareness and cognitive strategies subscales of the inventory were significantly and positively correlated with reading comprehension. Self- checking and evaluation subscales of the inventory were significantly and positively correlated with science course grades of the gifted students.

13) Enhancement of Metacognition Use and Awareness by Means of a Collaborative Intervention ; Santiago Sandi- Urena, Melanie M Cooper, Ron H Stevens (2011); International Compared to the control group, the treatment group showed a significant increase in metacognition awareness, as evidenced by the (Metacognitive Activities Inventory) MCAI, increased ability in solving non- algorithmic chemistry problems of higher difficulty, and with higher per cent correctness Interactive Multimedia Exercises (IMMEX). These findings are consistent with an overall increase in the use of regulatory metacognitive skills by the treatment group.

14) The role of metacognition in the relationship between objective and subjective measures of situation awareness ; Robert Rousseau, Sebastian Tremblay, Simon Banbury, Richard Breton, Adel Guitouni (2010) **;** Theoretical Issues in Ergonomics Science 11 (1) p. 119-130
No correlation was found between (Quantitative Assessment of Situation Awareness) QUASA confidence and accuracy scores. However, (Situation Awareness Rating Technique) SART SA (Situation Awareness), SART S (supply) and SART U (understanding) scores showed a negative correlation with QUASA accuracy scores.

❖ **Research Questions:-**
The following research questions are focused for this study:-
1. Is there any correlation between different metacognitive reading strategies and English achievement of students?
2. Is there any difference between overall metacognitive reading strategies and English achievement of students?
3. Is there a difference in metacognitive awareness of reading strategies between male and female students?

❖ **Hypothesis of the study:-**
1) There is positive and high correlation between Global reading strategy and English achievement of students.
2) There is positive and high correlation between Problem solving strategy and English achievement of students.
3) There is positive and high correlation between Support reading strategy and English achievement of students.
4) There is no significance difference between metacognitive reading strategies of boys and girls.
5) There is no significance difference between Global reading strategies of boys and girls.
6) There is no significance difference between Problem solving strategies of boys and girls.
7) There is no significance difference between Support reading strategies of boys and girls.

❖ **Population:**- Population isl IX standard students of all English medium schools in Raipur city.
❖ **Sample: -** A sample is a portion of people drawn from a larger population

The sample for the present study is taken from all English medium schools running in Raipur city. The whole city is divided in 5 zones, North, South, East, West and Central zone. From each zone one school is selected randomly and 100 Ninth standard students are selected from each school and from each zone situated in Raipur city. The total number of sample is 456 out of which 229 are boys and 227 are girls.
❖ **Method: -** Survey method was used for the study.
❖ **Tool used for the study:-** Metacognitive Awareness of Reading Strategies Inventory (MARSI), constructed and standardized by Kouider Mokhtari and Carla Reichard was used for the present study.

❖ **Analysis and Interpretation:-**
The data was collected and coefficient of correlation was found between:-
1) Global reading strategy and English achievement of students.
2) Problem Solving strategy and English achievement of students.
3) Support reading strategy and English achievement of students.
4) Mean, Standard Deviation, t-value is also calculated to measure the level of significance in Metacognitive reading strategies of male and female students.

5) Mean, Standard Deviation, t-value is also calculated to measure the level of significance in male and female students and Global reading strategy.
6) Mean, Standard Deviation, t-value is also calculated to measure the level of significance in male and female students and Problem solving strategy.
7) Mean, Standard Deviation, t-value is also calculated to measure the level of significance in male and female students and Support reading strategy.

*Table1:-** Showing Co-efficient of Correlation Between

Co-efficient of Correlation Between	r-value

Co-efficient of Correlation Between	r-value
Global Reading Strategy and English Achievement	0.54
Problem Solving Strategy and English Achievement	0 .59
Support Reading Strategy and English Achievement	0.61

*Table 2:-** Table showing Mean, S. D., t-value of the scores of Metacognitive Reading Strategies of Boys and Girls of IX standard students of Raipur city.

N	Mean		S.D.		t – value	Table value at	Significant /Insignificant
	Boys (229)	Girls (227)	Boys	Girls		0.05/0.01	
456	103.721	109.379	13.922	13.772	4.36	1.97/2.60	Significant

*Table 3:-** Table showing Mean, S. D., t-value of the scores of Global Reading Strategy of Boys and Girls of IX standard students of Raipur city.

	Mean of Global Reading strategy		S.D.		t – value	Table value at	Significant /Insignificant
N	Boys (229)	Girls (227)	Boys	Girls		0.05/0.01	
456	43.323	44.361	7.012	7.173	1.560	1.96/2.60	Insignificant

*Table 4:- Table showing Mean, S. D., t-value of the scores of Problem Solving Strategy of Boys and Girls of IX standard students of Raipur city.

N	Mean of Problem Solving Strategy		S.D.		t – value	Table value at	Significant /Insignificant
	Boys (229)	Girls (227)	Boys	Girls		0.05/0.01	
4 5 6	29.23 9	31.54 6	4.948	4.758	5.081	1.96/2.60	Significant

*Table 5:- Table showing Mean, S. D., t-value of the scores of Support Reading Strategy of Boys and Girls of IX standard students of Raipur city.

N	Mean of Problem Solving Strategy		S.D.		t – value	Table value at	Significant /Insignificant
	Boys (229)	Girls (227)	Boys	Girls		0.05/0.01	
4 5 6	31.16 2	33.47 1	5.561	4.948	4.69	1.96/2.60	Significant

III. FINDINGS

1} Table 1 reveals that Coefficient of Correlation between the scores of

a) Global Reading Strategy and English achievement of IX standard students of Raipur city is **0.540**. Hence the hypothesis is accepted. The relationship between Global Reading Strategy and English achievement is positive & high.

b) Problem Solving Strategy and English achievement of IX standard students of Raipur city is **0.59**. Hence the hypothesis is accepted. The relationship between Problem Solving Strategy and English achievement is positive & high.

c) Support Reading Strategy and English achievement of IX standard students of Raipur city is **0.61**. Hence the hypothesis is accepted. The relationship between Support Reading Strategy and English achievement is positive & high.

2} Table 2 reveals that t-value of the scores of Metacognitive Reading Strategies of Boys and Girls of IX standard students of Raipur city is **4.36** which is greater than the table value at both 0.01 and 0.05 level. The difference in the scores of Metacognitive Reading Strategies of Boys and Girls is significant and hence null hypothesis is rejected.

3} Table 3 reveals that t-value of the scores of Global Reading Strategies of Boys and Girls of IX standard students of Raipur city is **1.560** which is less than the table value at both 0.01 and 0.05 level. The difference in the scores of Global Reading Strategies of Boys and Girls is insignificant and hence null hypothesis is accepted.

4} Table 4 reveals that t-value of the scores of Problem Solving Strategies of Boys and Girls of IX standard students of Raipur city is **5.081** which is greater than table value at both 0.01 and 0.05 level. The difference in the scores of Problem Solving Strategies of Boys and Girls is significant and hence null hypothesis is rejected.

5} Table 5 reveals that t-value of the scores of Support Reading Strategies of Boys and Girls of IX standard students of Raipur city is **4.69** which is greater than table value at both 0.01 and 0.05 level. The difference in the scores of Support Reading Strategies of Boys and Girls is significant and hence null hypothesis is rejected.

IV. CONCLUSION

After analysis and interpretation the following conclusions were drawn:--

1) There is positive and high correlation between Global Reading Strategy and English achievement of ninth standard students of Raipur city‖ is approved and accepted as coefficient of correlation between Global Reading Strategy and English achievement is **0.540** which is positive and high.

2) There is positive and high correlation between Problem solving strategy and English achievement of ninth standard students of Raipur city‖ is approved and accepted as coefficient of correlation between Problem solving strategy and English achievement is **0.59** which is positive and high.

3) There is positive and high correlation between Support Reading Strategy and English achievement of ninth standard students of Raipur city‖ is approved and accepted as coefficient of correlation between Support Reading Strategy and English achievement is **0.61** which is positive and high.

4) There is no significance difference between metacognitive reading strategies of boys and girls‖ is disapproved as the t-value is **4.36** which are significant at both 0.05 and 0.01 level of significance.

5) There is no significance difference between Global reading strategies of boys and girls‖ is accepted as the t-value is **1.560** which is insignificant at both 0.05 and 0.01 level of significance.

6) "There is no significance difference between Problem solving strategies of boys and girls‖ is disapproved as the t-value is **5.081** which are significant at both 0.05 and 0.01 level of significance.

7) "There is no significance difference between Support Reading strategies of boys and girls‖ is disapproved as the t-value is **4.69** which are significant at both 0.05 and 0.01 level of significance.

❖**Educational Implications: -**

• Metacognition is essential to successful learning because it enables individuals to better manage their cognitive skills and to determine weaknesses that can be corrected by constructing new cognitive skills. Almost anyone who can perform a skill is capable of metacognition – that is, thinking about how they perform that skill.

• Promoting metacognition begins with building an awareness among learners that metacognition exists, differs from cognition, and increases academic success. The next step is to teach strategies, and more importantly, to help students construct explicit knowledge about when and where to use strategies. A flexible strategy repertoire can be used next to make careful regulatory decisions that enable individuals to plan, monitor, and evaluate their learning.

• Metacognition helps people to perform many cognitive tasks more effectively. Strategies for promoting metacognition include self-questioning (e.g. "What do I already know about this topic? How have I solved problems like this before?"), thinking aloud while performing a task, and making graphic representations (e.g. concept maps, flow charts, semantic webs) of one's thoughts and knowledge. Carr, 2002, argues that the physical act of writing plays a large part in the development of metacognitive skills.

• By definition, metacognition involves individual commitment and reflection. However, research suggests that a learner's ability to learn can be increased when an instructor spends some time discussing and helping students to use metacognitive strategies.

• Students who demonstrate a wide range of metacognitive skills perform better on exams and complete work more efficiently.

• They are self-regulated learners who utilize the "right tool for the job" and modify learning strategies and skills based on their awareness of effectiveness.

• Individuals with a high level of metacognitive knowledge and skill identify blocks to learning as early as possible and change "tools" or strategies to ensure goal attainment.

• Metacognologists are aware of their own strengths and weaknesses, the nature of the task at hand, and available "tools" or skills. A broader repertoire of "tools" also assists in goal attainment. When "tools" are general, generic, and context independent, they are more likely to be useful in different types of learning situations.

A mantra for metacognition:-

• State the learning problem with some specificity: identify what you want to know and what you want to do with that knowledge.

• Choose strategies to solve the learning problem—draw upon your own prior knowledge and the knowledge of others.

• Observe how you used the strategies—keep a learning journal or blog.

• Evaluate the results: What worked? What didn't work?

• Rinse and repeat: Apply successful strategies to new learning problems.

REFERENCES

[1].   http://education.calumet.purdue.edu
[2].   http://www.ericdigests.org
[3].   http://wik.ed.uiuc.edu
[4].   http://en.wikipedia.org/wiki/metacognition.
[5].   http://www.educatejournal.org/ 39
[6].   Educate~ Vol.7, No.1, 2007, pp. 39-47
[7].   http://www.ijese.com/60
[8].   http://www.tandfonline.com/doi/abs/
[9].   Vandana Singh, Self-Directed Learning Meaning and Praxis in classrooms, Journal of Indian Education, August 2010.
[10].   Azevedo, R., & Cromley, J. G. (2004). Does training on self-regulated learning facilitate students' learning with hypermedia? *Journal of Educational Psychology*, 96(3), 523-535.
[11].   Scruggs, Thomas E.; Mastropieri, M. A.; Monson, J.; & Jorgenson, C. (1985, Fall). Maximizing what gifted students can learn: Recent findings of learning strategy research. Gifted Child Quarterly*, 29(*4), 181-185.
[12].   Flavek, J.H.(1987) A new area of cognitive development inquiry. American Psychologist 34,906 – 911.
[13].   Journal of Educational Research, v105 n1 p1-7 2012.
[14].   Internet and Higher Education, v14 n3 p183-190 Jul 2011.
[15].   Metacognition and Learning, v6 n3 p303-314 Dec 2011.
[16].   International Journal of Science Education, v33 n3 p323-340 Feb 2011.
[17].   Metacognition and Learning, v5 n3 p269-288 Dec 2010
[18].   International Journal of Environmental and Science Education, v6 n1 p59-78 Jan 2011.
[19].   International Journal of Disability Development Education 41 (1) p. 15-32
[20].   Applied Psycho Linguistics 9 (2) p. 123-139
[21].   Bogaziçi University Journal of Education 19 (1) p. 1-11
[22].   International Journal of Science Education 33 (3) p. 323-340
[23].   Theoretical Issues in Ergonomics Science 11 (1) p. 119-130
[24].   http://www.informaworld.com/10.1080/14639220903010076
[25].   Handbook of metacognition in education.