



STUDY OF METACOGNITION AND SELF EFFICACY AMONG B.ED STUDENTS IN RELATION TO THE LOCATION OF THEIR INSTITUTION

Neena Sawhney, Ph.D

Principal, Chandigarh College of Education, Landran, Sector 112 Greater Mohali, Distt Mohali

Abstract

Metacognition is the awareness about and control over the way information is acquired, processed and stored in the human mind whereas Self-efficacy refers to a belief in one's ability to successfully perform a particular behavior or task. The present study was conducted to find the relationship of Metacognition and Self efficacy among prospective teachers studying in urban area and rural area on a sample of 200 B.Ed students. The results indicate that students of urban area showed greater mean score in KOC (knowledge of cognitive process), ROC (Regulation of Cognitive process) and total Metacognition, than students of rural area. No significant difference was found in self efficacy of B.Ed students studying urban and rural area institutions. Significant relationship was observed between Self efficacy and metacognition of B.Ed students studying in institutions located in urban area and no significant relationship was found between Self efficacy and metacognition of B.Ed students studying in rural area.

Keywords: *Metacognition, KOC, ROC, Self Efficacy, Prospective teachers*



Scholarly Research Journal's is licensed Based on a work at www.srjis.com

Introduction

The future of any nation depends upon its youth. An emancipated, forward thinking, self reliant, self sufficient, self aware individual will be open to the changing needs of the society and act accordingly for furthering its role in global collaboration. The intellectual bank of the country is

roughly those 5 % individuals whom we call the Engines “the leaders” who contribute in pulling the country in their wake for greater glory and good of the nation. In fact certain sources claim that only 1 % of committed people have the capability of leading and changing the world. The leaders in any field are easily identified by their commitment, creativity, passion, ability to take charge of any situation, and are easily distinguishable for using their intellect/cognition to further their cause. Skill sets required from leaders today are different as the virtual world demands an understanding of handling complexity, communicating virtually, and working across cultures. James O’Toole (1996) has emphasized that today’s leaders need to have value based qualities like understanding of the differing and conflicting needs of your followers, ability to energize followers to pursue a better goal that they had thought possible and skills in creating a values-based umbrella large enough to accommodate the various interests of followers, but focused enough to direct all their energies in pursuit of a common good.

At the same time qualities like Metacognition, self efficacy, self belief play a large role in differentiating leaders from the followers.

Metacognition

Metacognition is the “executive” process that monitors and controls one’s cognitive processes, and is often defined in terms of metacognitive knowledge and metacognitive experiences (Flavell, 1979; 1987). The more students are aware of their thinking processes as they learn, the more they can control such matters as goals, dispositions, and attention. Self-awareness promotes self-regulation. If students are aware of how committed (or uncommitted) they are to reaching goals, of how strong (or weak) is their disposition to persist, and of how focused (or wandering) is their attention to a thinking or writing task, they can regulate their commitment, disposition, and attention (Marzano et al., 1988). Metacognitive skills include taking conscious control of learning, planning and selecting strategies, monitoring the progress of learning, correcting errors, analyzing the effectiveness of learning strategies, and changing learning behaviors and strategies when necessary." (Ridley, D.S., Schutz, P.A., Glanz, R.S. & Weinstein, C.E., 1992)

Metacognition is an important concept in cognitive theory. It consists of two basic processes occurring simultaneously: *monitoring your progress* as you learn, and *making changes and adapting* your strategies if you perceive you are not doing so well. (Winn, W. & Snyder, D., 1998) It's about self-reflection, self-responsibility and initiative, as well as goal setting and time

management. Metacognition can be loosely defined as “thinking about one’s own thinking”. More specifically, metacognition is “an appreciation of what one already knows, together with a correct apprehension of the learning task and what knowledge and skills it requires, combined with the ability to make correct inferences about how to apply one’s strategic knowledge to a particular situation, and to do so efficiently and reliably” (Peirce, 2003, p. 2). Students who are able to identify suitable learning strategies in the proper situation are using metacognition. For example a student may understand that he has difficulty in finding the connection between important concepts within a story. If he/she has been taught to use a graphic organizer, such as a concept map, to identify the main concepts and link them together using lines, similar to a spider web, then that student has used metacognition to complete the task (Nelson & Conner, 2008). In general, metacognition is the engine that drives self-directed learning.

Veenman (2006) attempted to correlate intelligence with metacognition yielded the result that intelligent people usually have high metacognition, but some metacognitively advanced students do not score as having high intelligence. While there is a strong correlation between the two, it is far from predictive. Nelson & Conner (2008) studied the influence of metacognition on various stages of learning. It was concluded that the main struggles that the students face in trying to develop an understanding of metacognition is the lack of awareness to their learning process. Students even at the rudimentary level, have some basic understanding of their own knowledge and thinking. Ozsoy et al. (2009) investigated the relationship between fifth grade students’ metacognition levels, and their study habits and attitudes. The results revealed that there is a medium positive relationship between metacognitive knowledge and skills and study habits, study attitudes and study orientation. Additionally, the results of the study showed that there is no significant relationship between metacognition and study habits and attitudes for low and medium achievers but, there is a significant relationship for high achievers.

Andrew (2010) undertook a study on the Influence of cognitive and metacognitive strategies on deep learning and concluded that metacognitive strategies help children of all ages to develop highly critical cognitive functioning ability, which results in deep understanding and develop problem solving skills. Metacognition is similar to self-efficacy in that metacognitive self-assessments have been related to an individual’s ability to perform a task, solve problems, or acquire new skills (Cuevas et al., 2004; Davidson et al., 1994; Hartman, 2001; Paris &

Winograd, 1990). Improving the accuracy of metacognitive judgments has also been found to lead to an improvement in learning or task performance (Kruger & Dunning, 1999).

Self Efficacy

Self-efficacy refers to a belief in one's ability to successfully perform a particular behavior or task (Cassidy & Eachus, 1998). Although the knowledge and skills people possess play critical roles on the choices they make, people's level of motivation, and actions are based more on what they believe than on what is objectively true. Self-efficacy beliefs provide the foundation for human motivation, well-being, and personal accomplishment. People have little incentive to act if they believe that the task in their hands exceed their capabilities, but they undertake and perform activities if they believe that their actions can produce the desired outcomes (Bandura, 1977; 1986; Pajares, 2002).

According to Bandura, 1977, there are four major sources of self-efficacy. **Mastery Experiences** "i.e performing a task successfully strengthens our sense of self-efficacy; **Social Modeling** i.e witnessing other people successfully completing a task ; **Social Persuasion** i.e people could be persuaded to believe that they have the skills and capabilities to succeed, and **Psychological Responses** i.e our own responses and emotional reactions to situations also play an important role in self-efficacy.

Perceived self-efficacy influences the level of goal challenge people set for themselves, the amount of effort they mobilize, and their persistence in the face of difficulties. Perceived self-efficacy is theorized to influence performance accomplishments both directly and indirectly through its influences on self-set goals." Zimmerman et al. (1992: 665)

Motivation suffers when self-efficacy is low. Learners won't attempt a task if they feel their chance of success is poor. They need to feel efficacious enough to meet the difficulties of the task head on and plug in needed effort and strategies (Schunk, 1994).

Staples et al. (1998) has elaborated upon the self-efficacy theory and suggests that there are four major sources of information used by individuals when forming self-efficacy judgments. In order of strength:

1. **Performance accomplishments:** personal assessment information that is based on an individual's personal accomplishments. Previous successes raise mastery expectations, while repeated failures lower them.

2. **Vicarious experience:** gained by observing others perform activities successfully. This is often referred to as modeling, and it can generate expectations in observers that they can improve their own performance by learning from what they have observed.

3. **Social persuasion:** activities where people are led, through suggestion, into believing that they can cope successfully with specific tasks. Coaching and giving evaluative feedback on performance are common types of social persuasion

4. **Physiological and emotional states.** The individual's physiological or emotional states influence self-efficacy judgments with respect to specific tasks. Emotional reactions to such tasks (e.g., anxiety) can lead to negative judgments of one's ability to complete the tasks.

Self-efficacy affects all aspects of life, including exercise and health behaviors, emotional responses, academic pursuits, and career choices. When one possesses high self-efficacy, one is more likely to choose tasks one believes one will succeed at, set and focus on higher goals, persevere, even in the face of adversity, and learn and achieve more than those without high self-efficacy (Ormrod, 2008). Anna et al (2005) investigated the joint effects of academic self-efficacy and stress on the academic performance of 107 nontraditional, largely immigrant and minority, college freshmen at a large urban commuter institution. The results suggested that academic self-efficacy was a more robust and consistent predictor than stress of academic success. In high school students, science self-efficacy correlates with science achievement and is a better predictor of achievement and engagement with science-related activities in and out of the classroom than are gender, ethnicity, and parental background { Britner et al (2006), Kupermintz (2002). Palincsar et al. (1988)}.

According to Schunk, & Zimmerman (2007) a reciprocal relationship exists between the capacity of self-regulation and the self-efficacy beliefs. As students increase their self-regulation capacity, they increase their self-efficacy beliefs, and vice versa: these self-efficacy beliefs allow the student to face new, self-regulated learning. Self-regulated learners are more self-efficacious for learning than are students with poorer self-regulatory skills; the former believe that they can use their self-regulatory skills to help them learn,{Pintrich (2000), Schunk (2001), Zimmerman (2000)} .

Research Method

The study was conducted through descriptive survey method of research. 100 prospective teachers from Mohali area and 100 prospective teachers from Moga area studying in teachers training course in B.Ed colleges to become middle school teachers were selected randomly.

Objectives: This study was conducted to determine the self efficacy and metacognition awareness among prospective teachers studying in B.Ed colleges of Mohali and Moga. Further, this study sought to achieve the following objectives:

- (1) To determine the difference in the Metacognition awareness of B.Ed. students studying in urban and rural area
- (2) To determine the difference in the Self Efficacy of B.Ed. students studying in urban and rural area
- (3) To find the relationship between Self efficacy and Metacognition of B.Ed. (graduate)

Tools Used

Self Efficacy Scale: The self efficacy scale is a 5 point Likert developed by G. P. Mathur and R. K. Bhatnagar. The scale consists of 22 items (15 positively worded and 7 negatively phrased) in Eight Area—I. Self Regulatory Skills, II. Self influence, III Self Confidence, IV. Social Achievement, V. Self, VI. Self Evaluation, VII. Self Esteem, VIII. Self Cognition.

Metacognition Inventory (MCI): To measure the metacognition aspect of the sample the investigator used the Metacognition Inventory developed by P. 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.

Discussion

The data obtained was subjected to statistical analysis and descriptive analysis as mean and standard deviations were used wherever required. Correlation was computed to find out relationship between the variables. The mean differentials on the Metacognition awareness, the 2 aspects of metacognition i.e KOC (knowledge of cognitive process) and ROC (Regulation of Cognitive process) and Self efficacy were computed and the results are discussed below.

Table 1: Mean differentials in KOC (Knowledge of Cognitive process) of B.Ed students studying in Mohali and Moga

Variable	B. Ed students of Mohali (n=100)		B.Ed students of Moga (n=101)		t-value	Level of Significance
	Mean	S.D.	Mean	S.D.		
KOC	36.88	6.9910	32.8118	7.7790	3.9003	.01

Table 1 depicts the mean differentials on KOC (Knowledge of Cognitive Process). On the variable of KOC the mean of prospective teachers of Mohali area was 36.88 and the standard deviation was 6.9910 whereas the mean of prospective teachers of Moga was 32.8118 and the standard deviation was 7.7790. The t test revealed that the difference in their values was 3.9003 which was found to be significant at .01 level of significance. Thus this indicates that there is a significant difference in KOC i.e. knowledge of cognitive process in relation to location of their institute.

Table 2: Mean differentials on ROC (Regulation of Cognitive process) of B.Ed students studying in Mohali and Moga

Variable	B. Ed students of Mohali (n=100)		B.Ed students of Moga (n=101)		t-value	Level of Significance
	Mean	S.D.	Mean	S.D.		
ROC	50.44	7.9051	44.148	10.9867	4.6635	S*

The mean differentials on ROC (Regulation of Cognitive process) reveal that the mean of prospective teachers of Mohali area was 50.44 and the standard deviation was 7.9051 whereas the mean of prospective teachers of Moga was 44.148 and the standard deviation was 10.9867. The t test revealed that the difference in their values was 4.6635, which was found to be

significant at .01 level of significance. Thus this indicates that there is a significant difference in ROC (Regulation of cognitive process) in relation to location of their institute.

Table 3: Mean differentials in Metacognition awareness of B.Ed students studying in Mohali and Moga

Variable	B. Ed students of Mohali (n=100)		B.Ed students of Moga (n=101)		t-value	Level of Significance
	Mean	S.D.	Mean	S.D.		
Metacognition awareness	87.32	14.14633	76.960	17.84372	4.56337	S*

Table 3 reveals that on variable of Metacognition awareness, the mean of prospective teachers of Mohali area was 87.32 and the standard deviation was 14.14633 whereas the mean of prospective teachers of Moga was 76.960 and the standard deviation was 17.84372. The t test revealed that the difference in their values was 4.56337 which was found to be significant at .01 level of significance. Thus this indicates that there is a significant difference in metacognition of prospective teachers in relation to location of their institute.

Table 4: Mean differentials in Self Efficacy of B.Ed students studying in Mohali and Moga

Variable	B. Ed students of Mohali (n=100)		B.Ed students of Moga (n=101)		t-value	Level of Significance
	Mean	S.D.	Mean	S.D.		
Self Efficacy	70.31	5.9334	71.24	7.3993	-1.03986	N.S

Table 4 reveals that on variable of Self Efficacy, the mean of prospective teachers of Mohali area was 70.31 and the standard deviation was 5.9334 whereas the mean of prospective teachers of Moga was 71.24 and the standard deviation was 7.3993. The t test revealed that the difference in their values was -1.03986 which was not significant at any level. Thus this indicates that there is no difference in self efficacy of prospective teachers in relation to location of their institute.

Relationship between Metacognition and Self Efficacy

Table 5 Showing relationship between KOC, ROC , Metacognition and Self Efficacy of B.Ed students studying in Mohali (Urban Area)

	<i>KOC</i>	<i>ROC</i>	<i>MCI</i>	<i>SES</i>
KOC	-			
ROC	0.802978	-		
MCI	0.942907	0.955638	-	
SES	0.304562*	0.271635*	0.302306*	-

The relationship between Self efficacy and metacognition was analyzed for students studying in Mohali on the outskirts of Chandigarh (Urban area) and it was found that correlation between SES and KOC was .304562 which is significant at the .01 level of significance. Correlation between Self efficacy and ROC was .27163 and between Self Efficacy and Total Metacognition it was .302306 which was significant at .01 level of significance . Thus this indicates that there is a significant relationship between Self efficacy and metacognition of prospective teachers studying in Mohali.

Table 6 Showing relationship between KOC, ROC , Metacognition and Self Efficacy of B.Ed students studying in Moga (Rural Area)

	<i>KOC</i>	<i>ROC</i>	<i>MCI</i>	<i>SES</i>
KOC	-			
ROC	0.802515	-		
MCI	0.93008	0.96558	-	
SES	0.096996	0.157805	0.139449	-

The relationship between Self efficacy and metacognition was analyzed for students studying in Moga (Rural area) and it was found that even though the correlation between ROC and KOC at .802515; Metacognition and KOC at .93008; and Metacognition and ROC at .96558 was highly significant at .01 level. Yet correlation of Self efficacy with KOC (knowledge of cognitive process) was .0969 which is not significant at any level significance. Between Self efficacy and ROC (Regulation of Cognitive process) was .157805 and between Self Efficacy and Total Metacognition it was .139449 which was not significant any level of significance. Thus this

indicates that there is no significant relationship between Self efficacy and metacognition of prospective teachers studying in Moga.

FINDINGS AND CONCLUSION

1. There is a significant difference in KOC i.e. knowledge of cognitive process in relation to students studying in rural area and urban area. The students of urban area showed greater mean score in knowledge of cognitive process.
2. There is a significant difference in ROC i.e. regulation of cognitive process in relation to students studying in rural area and urban area. The students of urban area showed greater mean score in regulation of cognitive process.
3. There is a significant difference in total metacognition of B.Ed students studying in rural area and urban area. The students of urban area showed greater mean score in regulation of cognitive process.
4. There is no difference in self efficacy of B.Ed students in relation to location of their institute i.e. urban and rural.
5. There is a significant relationship between Self efficacy and metacognition of B.Ed students studying in institutions located in Mohali (urban area).
6. There is no significant relationship between Self efficacy and metacognition of B.Ed students studying in Moga (rural area).

The findings of the present study revealed that area plays a significant role in developing the metacognition and self efficacy of graduate students. Promoting metacognitive awareness and self efficacy could be a valuable method for improving learning and performance at all ages. Teachers can play a very significant role in this regard. Parents, the family environment, teacher and community influence the behavior and decisions taken by students. If a learner is well acquainted with his own concept of knowledge i.e. existing knowledge, acquiring knowledge, along with the regulation of his cognitive processes, he can achieve success. Positive correlation between self efficacy and metacognition in students of urban area also showed that location /area of institution helped learner not only understand the task/activity/content but also develop positive belief for achieving the goal. However, no relationship between self efficacy and metacognition in students of rural area revealed that knowledge of metacognitive awareness does not impact the self efficacy of the learners studying in rural area. Based on these results we

suggest that further research is needed to clarify the relationship between self-efficacy and metacognition in learners of urban and rural area.

References

- Andrew D. Cohen and Ernesto Macaro. (2010). *Language Learner Strategies: Thirty years of research and practice*, (pp. 141–160). Oxford: Oxford University Press
- Anna Zajacova, Scott M. Lynch, and Thomas J. Espenshade (2005) *Research in Higher Education*, Vol. 46, No. 6, September 2005 DOI: 10.1007/s11162-004-4139-z
- Bandura, A. (1986). *Social foundations of thought and action: a social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*, New York: W.H. Freeman.
- Britner, S. L., & Pajares, F. (2006). Sources of Science Self-Efficacy Beliefs of Middle School Students. *Journal of Research in Science Teaching*, 43(5), 485.
- Cassidy, S. & Eachus, P. (1998). Developing the computer self-efficacy (CSE) scale: investigating the relationship between CSE, gender and experience with computers. *Journal of Educational Computing Research*, 26(2), 133-153.
- Cuevas, H.M., Fiore, S.M., Bowers, C.A., and Salas, E. (2004). “Fostering Constructive Cognitive and Metacognitive Activity in Computer-Based Complex Task Training Environments,” *Computers in Human Behavior*, Vol.20, No.2, pp. 225-241.
- Davidson, J.E., Deuser, R., and Sternberg, R.J. (1994). “The Role of Metacognition in Problem Solving,” in Metcalfe, J., and Shimamura, A.P. (Eds.), *Metacognition: Knowing about Knowing*, Cambridge, MA: MIT Press, pp. 207-226.
- Hartman, H.J. (2001). *Metacognition in Learning and Instruction: Theory, Research, and Practice*, Amsterdam: Kluwer Academic Press.
- Kruger, J. and Dunning, D. (1999). “Unskilled and Unaware of It: How Difficulties in Recognizing One’s Own Incompetence Lead to Inflated SelfAssessments,” *Journal of Personality and Social Psychology*, Vol.77, No.6, pp. 1121-1134.
- Kupermintz, H. (2002). Affective and conative factors as aptitude resources in high school science achievement. *Educational Assessment*, 8, 123-137

- Marzano, R. J., Brandt, R. S., Hughes, C. S., Jones, B. F., Presseisen, B. Z., Rankin, S. C., & Suhor, C. (1988). *Dimensions of thinking: A framework for curriculum and instruction*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Nelson, S., & Conner, C. (2008). *Developing self-directed learners*. Retrieved January 15, 2008 <http://www.nwrel.org/planning/reports/self-direct/self.pdf>.
- Ormrod, J. E. (2008). *Human learning* (5th ed.). Upper Saddle River, N.J.: Pearson Education Inc.
- O'Toole, James. 1996. *Leading change: The argument for value-based leadership*. New York: Ballentine Books.
- Ozsoy, G., & Ataman, A. (2009). The effect of metacognitive strategy training on problem solving achievement. *International Electronic Journal of Elementary Education*, 1(2), 67–82.
- Pajares, F. (2002) Overview of social cognitive theory and of self-efficacy. Retrieved from <http://www.des.emory.edu/mfp/eff.html>
- Palincsar, A. S., & Brown, A. L. (1988). Teaching and practicing thinking skills to promote comprehension in the context of group problem solving. *Remedial and Special Education (RASE)*, 9(1), 53-59.
- Paris, S.G., and Winograd, P. (1990). “How Metacognition Can Promote Academic Learning and Instruction,” in Jones, B.F., and Idol, L. (Eds.), *Dimensions of Thinking and Cognitive Instruction*, Hillsdale, NJ: Lawrence Erlbaum & Associates, pp. 15-51
- Peirce, W. (2003). *Metacognition: Study strategies, monitoring, and motivation*. Retrieved from <http://academic.pg.cc.md.us/~wpeirce/MCCCTR/metacognition.htm>
- Pintrich, P. R. (2000). The Role of Goal Orientation in Self-Regulated Learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-Regulation* (Pp. 451-501). San Diego, CA: Academic Press.
- Ridley, D.S., Schutz, P.A., Glanz, R.S. & Weinstein, C.E. (1992). Self-regulated learning: the interactive influence of metacognitive awareness and goal-setting. *Journal of Experimental Education* 60 (4), 293-306

- Schunk, D.H. & Zimmerman, B.J. (2007). Influencing Children's Self-Efficacy and Self-Regulation of Reading and Writing through Modeling. *Reading and Writing Quarterly*, 23, 7-25.
- Schunk, D.H. (1994, April). Student motivation for literacy learning: The role of self-regulatory processes. Paper presented at the annual meeting of the American Educational Research Association, New Orleans LA.
- Schunk, D.H. (2001). Social Cognitive Theory and Self-Regulated Learning. In Zimmerman, B.J., & Schunk, D.H. (Eds.). *Self-Regulated Learning and Academic Achievement: Theoretical Perspectives-Theories-An Educational Perspective*. New Jersey: Prentice Hall. (Pp 125-151). New York, NY: Lawrence Erlbaum Associates.
- Staples D. Sandy, John S. Hulland & Christopher A. Higgins, (1998), *Journal of Computer-Mediated Communication*, 3 (4).
- Veenman , Marcel V. J. (2002). Metacognition and learning: conceptual and methodological considerations, *Metacognition Learning* , 3-14 , DOI 10.1007/s11409-006-6893-0
- Winn, W. & Snyder D. (1996). Cognitive perspectives in psychology. In D.H. Jonassen, ed. *Handbook of research for educational communications and technology*, 112-142. New York: Simon & Schuster Macmillan
- Zimmerman Barry J.; Albert Bandura; Manuel Martinez-Pons (1992). Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal Setting, *American Educational Research Journal*, Vol. 29, No. 3. (Autumn, 1992), pp. 663-676.
- Zimmerman, B. J. (2000). Attaining Self-Regulation: A Social Cognitive Perspective. In P. R. P. Boekaerts & M. Zeidner (Eds.), *Handbook of Self-regulation* (Pp. 13-41). San Diego, CA: Academic Press.