Relationship between Metacognitive Ability and Academic Achievement of B. Ed Students - A Study

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Abstract: *Recently, the partnership for 21st century skills has identified self-directed learning as one of the life and career skills necessary to prepare students for post secondary education and at the workplace. The purpose of this study is to assess the Meta cognitive ability of B. Ed students and its relation to their academic achievement. A sample of 300 B. Ed Students have been selected randomly from six teacher training colleges of Kamrup district of Assam. Meta cognitive Inventory, constructed and standardized by Punita Govil has been used for collection of data. A significant positive relationship has been observed between Meta cognitive ability and academic achievement of B. Ed students.*

Keywords: Meta cognitive ability, Academic achievement, B. Ed Students

1. Introduction

Individuals acquires different knowledge, attitudes and skills through the process of learning. To learn and understand different subjects in schools, students and teachers have to employ different learning strategies. In teacher training colleges, teacher trainees need critical observation and transferable thinking. Besides, for better understanding and use of knowledge in practice, systematic and meaningful learning strategies are necessary. In this regard, Meta cognitive strategies can be used by teachers and students for meaningful learning. Meta cognition has emerged as a major focus of research due to it's growing acceptance of the fact that Metacognition or self awareness including awareness of ourselves as learners help us to learn more effectively. Metacognition is simply defined as 'thinking over thinking that is used to teach students 'learn how to learn''. It is the knowledge about when and where to use particular strategies for learning or problem solving. John Flavell (1979) originally coined the term 'meta cognition' as 'cognition about cognitive phenomenon'. Kuhn and Dean (2004) defined Metacognition as 'awareness and management of one's own thought'. Martinez (2006) defined it as monitoring and control of thought'. Cognitive strategies are used to help an individual to achieve a particular goal e.g. understanding a text, while Meta cognitive strategies are used to ensure that the goal has been reached like, quizzing oneself to evaluate one's understanding of that text. Meta cognitive strategies are actions which goes beyond purely cognitive devices and which provides learners to co-ordinate their own learning processes (Begaum, 2007). Meta cognitive knowledge is used to regulate thinking and learning. (Brown 1987: Nelson, 1996). There are three essential skills and allow us to do this –Planning, Monitoring and Evaluation. Planning involves deciding how much time to give to a task, which strategies to use, how to start, what resources to gather, what order to follow, what to skip, and what to give intense attention and so on. Monitoring is the awareness of 'how I am doing?' Monitoring entails asking, 'Is this making a sense? Am I going too fast ? Evaluation involves making judgement about the process and outcome of thinking and learning. Meta cognitive and cognitive strategies may overlap in that the same strategy, such as questioning could be regarded as either a cognitive or a meta cognitive strategy depending upon the purpose for using that strategy may be. Cognitive and Meta cognitive strategies are closely intertwined and dependent upon each other. There are different Meta cognitive strategies such as self-questioning, PQ4R, KWL, IDEAL etc. By incorporating these strategies students can be helped to follow a wise course of action in the process of learning. Meta cognitive regulation is the monitoring of one's cognition and includes planning activities, awareness of comprehension and task performance, and evaluation of the efficacy of monitoring processes and strategies. For teaching students skills of performing various educational tasks, Meta cognitive strategies are in use in the schools. According to Piaget, Meta cognitive skills used in education play pivotal roles in the lives of students. He pointed out that Meta cognitive strategies help students in understanding how to verbalize the task, became aware of thinking and how to perform the practical skills. Very often, teaching designs that are in used in teaching the students do not help them in developing cognitive skills they require, for which students sometimes end up failing to achieve some of the fundamental skills that they need to prosper academically. It has been observed that some students have limitations in using Meta cognitive strategies in understanding complex issues. Meta cognitively aware students plan their work properly, know well to manage the information available, monitor their own progress and evaluate them periodically, correct their mistakes in time and always be aware of their knowledge. Using an appropriate teaching strategy for a given learning objective can enhance student's academic achievement. This awareness leads to meaningful learning of the subjects. In this study, an attempt has been made to know the impact of Meta cognitive abilities of teacher trainees on their academic achievement and the problem of the study has been stated as

1.1 Statement of the Problem

"Relationship between Meta cognitive Ability and Academic Achievement of B. Ed Students- A Study'

1.2 Objectives of the Study

- To know the differences in Meta cognitive ability of the B. Ed students in respect of their Sex, Locality, Types of Management and Educational Qualification.

- To study the relationship between Meta cognitive ability and Academic Achievement of the B. Ed students.

1.3 Hypotheses of the Study

- There exist no significant differences in the meta cognitive ability of male and female, rural and urban, private and government, graduate and postgraduate B. Ed students.
- There exists no significant relationship between Meta cognitive ability and academic achievement of the B. Ed students.

1.4 Significance of the Study

The new generation teachers suffer from different problems in their classroom practices. This situation calls for a change in teacher education programme. Educationists and psychologists have already considered the importance of Metacognition and self regulated learning for one's success in career and life activities as well. Since B. Ed course is a teacher training programme, the aspiring teachers are expected to have necessary awareness on the role of Meta cognitive abilities and strategies, that may be inculcated among the students. The findings of the study will be helpful for teachers also, as use of meta cognitive strategies will ensure the students learning. Human behaviours are usually resulted from higher cognitive functions. Awareness and training in cognitive and meta cognitive strategies will prepare students not only for achievement, but enable them for making critical thinking and contribute in human factor design, information technology, data retrieval and education in general.

1.5 Operational Definition of the Terms

Meta cognitive Ability- Flavell (1976) defined Metacognition as the knowledge concerning one's own cognitive process and products or anything related to them.

Academic Achievement- Academic achievement has been accepted as the accomplishment of the teacher trainees in the academic domain as indicated by the marks in undergraduate level final examination.

2. Review of Related Literature

Review of research studies reveals that though the concept of meta-cognition is still growing, yet a large number of studies conducted in this area have draw the attention of the academia. Enhanced learning outcome and academic achievement is related with use of Meta cognitive abilities, observed (Wittirock, M, 1983). Bigg and Bondy (1987) observed that Meta cognitive knowledge and strategies develop variedly with age. Meta cognition is finite skills highly correlated with academic success, found Garcia, T. (1994) and Pintrich, Peklaj and Pecjak , 2002, Sperling, et el (2002), and Zimmerman 2004. High positive correlation between metacognitive awareness and achievement has been observed by Ramdevi and Kumar (2010). Teaching through metacognitive learning can improve students' performance. (Dijonckheere et.al, 2012). Training in metacognitive strategies can improve student's achievement (Onu et. al

2012). Experimental evidences of the studies carried out by Goh (1997), Swarup (1999) and Antonietti (2000) also support that metacognion has impact on one's performance. Students ability to regulate their performance is influenced by environmental variables, social interaction, own regulatory skills and adult role in problem solving processes. Findings of different studies observed that environmental variables as institution in rural or urban setting, parent's involvement, educational level significantly influence the Meta cognitive process of the students.

From the above findings and observation, we can see that though it is accepted that significant positive relationship exist between Metacognition and academic achievement, studies in Indian context on meta cognition and that to at secondary level teacher training is very limited. Here, an attempt has been made in this study to know the difference in meta-cognitive ability of the B. Ed students as per their sex, area of the institution, subject of study and educational qualification. It is expected that findings of the study will be important in curriculum revision at the teacher education level.

3. Method

Descriptive survey method was used in the study.

3.1 Sample

A sample of 300 B. Ed students have been selected randomly from six teacher training colleges of Kamrup district of Assam.

3.2 Tools

Meta cognitive Inventory (MCI) constructed and standardized by Punita Govil in 2003 was used for the study. The inventory contains 30 statements of four point scale. All the statements are positive and classified in two categories- knowledge and regulation of cognitive process. The reliability co-efficient of the test is .85. B. A. / B. Sc final marks have been considered for academic achievement. Personal data sheet were used for collecting information of the demographic variables.

3.3 Variables

In the Study, Meta cognitive ability has been considered as dependent and academic achievement as independent variable. Sex, area, educational qualification, and management of the institution of the B. Ed students were considered as Demographic variables.

3.4 Statistical Techniques

Mean, Standard deviation and t' test was used for knowing the differences in meta cognitive ability of the teacher trainees and Pearson's Product moment co-efficient of co-relation was employed to examine the relationship between mete-cognitive ability and academic achievement.

4. Result and Discussion

Analysis and discussion of the data were presented in the following tables-

Table 1: Significance of differences in the mean scores of Meta cognitive abilities of the B. Ed students

Variables	categories	N	Mean	Standard deviation	t' value	Remark
Sex	male	117	93.27	11.42	2.19	*
	female	183	95.85	9.78		
Area	rural	132	92.86	11.23	2.77	**
	urban	168	96.32	10.47		
Types of management	private	213	92.87	12.31	1.93	-----
	Govt	87	95.39	9.31		
Educational qualification	graduate	186	93.11	9.89	2.38	*
	Post graduate	114	96.25	11.81		
Total	B. Ed students	300	94.73	10.85		

*=significant at .05, **= significant at .01 level

From the table 1 and it's corresponding figure, it has been observed that the calculated t' value (2.19) is higher than the table value regarding difference in the mean scores of meta cognitive ability of male and female B. Ed students. The mean score of meta cognitive ability of female B. Ed. Students is higher than the male students. This finding of the study is supported by the observation made by Winslow, 2006 and Manivannan, 2006, Devaki, V. And Puspam L Mary 2011, Annaraja, P and Titus,V Sheeja(2012). This may be due to the fact that female students are found to be sincere and planed from their childhood, for which they may naturally, used in applying Meta cognitive strategies in learning subjects. Significant difference has been observed between rural and urban teacher trainees. The mean score of the B. Ed students from urban area were found to be higher than the students from rural area. It is assumed that the cause of difference may be due to the greater exposure of urban B. Ed students and better communication facility, and more participation in extra-curricular activities than the rural area. This finding is in conformity with the observation made by Devaki, V A and Puspam. L. Mary, 2011, Rekha, R. And Govil, P. 2013. Table 1 also shows that significant difference in Meta cognitive ability exist between students of graduate and post graduate level. Meta cognitive ability of post graduate students pursuing B. Ed are found to be higher than the graduate students. However, no significant difference has been observed between the students of private and govt. Teacher training colleges in their Meta cognitive ability, though students from govt teacher training college score higher mean score than that of the private teacher training colleges.

Table 2: Relations between meta cognitive ability and academic achievement of the B. Ed Students

Variables	N	df	r	Remark
Meta cognitive Ability and Academic Achievement	300	298	.192	**

Table 2 reveals that t he calculated r value (.192) is higher than the table value at 1% level of significance. Therefore, the null hypothesis of no relation between Meta cognitive

ability and academic achievement of the B. Ed students has been rejected and concluded that there is significant positive relationship between Meta cognitive ability and academic achievement of the B. Ed students.

5. Major Findings of the Study

1) There exist significant difference in Meta cognitive ability of male and female, rural and urban, graduate and post graduate students, however no significant difference has been observed between students of Govt and private teacher training colleges.
2) There exist significant positive relationship between Meta cognitive ability and academic achievement of B. Ed students.

6. Educational Implication

Use of Meta cognitive strategies enables students to understand and transfer their learning in different situations that ultimately improve their learning. Students should therefore be encouraged to learn subjects by using Meta cognitive strategies that may help them in better information management, planning and monitoring activities for attaining goals to understand the errors while evaluating the process of learning. Teaching through Meta cognitive ability will improve the academic performance of the students and make them expert learners.

7. Suggestions

Teachers should be made aware about the role of Meta cognitive abilities in learning. Similarly, creation of Meta cognitive learning environment for developing students Meta cognitive ability should also be equally emphasized. Curriculum should be framed to include activity based Meta cognitive skills and make it an integral part of pedagogy, irrespective of the cognitive styles of education. The profound influence of the Meta cognitive approach on teacher training should be felt in terms of modifications of teacher training curriculum which should emphasize specific behavioural techniques, process based instruction, cognitive curriculum and learner centred and self directed learning activities. Adequate effort should be made by NCTE to introduce cognitive educational theory and techniques into teacher education programmes. The results revealed that teacher trainees with high academic achievement have more meta cognitive ability than low academic achiever. Therefore, teacher educators should arrange instructional methods, classroom activities in a constructivist learning environment.

8. Scope for future Study

The influence of Meta cognitive strategies on human learning has been recognized and accepted. Assessment of different Meta cognitive strategies, its use in innovative pedagogic modification, identifying subject specific, area specific, and task specific cognitive and Meta cognitive strategies are some of the important areas of meta-cognitive studies. As research work on Metacognition in the India is

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limited, intensive research work needs to be undertaken in general and Indian context in particular.

9. Conclusion

The findings of the present study reveals that there is positive relationship between Meta cognitive ability and academic achievement of the B. Ed students. Teachers can play significant role in developing Meta cognitive strategy to make them better learners. Teaching various types of knowledge to have declarative knowledge, awareness about the factual information, procedural knowledge, to follow systematic way of dealing with problems, or tasks, and conditional knowledge, to know how and when to use the procedure effectively for solving the problems are necessary for meaningful learning . A careful guidance in recognizing and regulating one's own process of thinking may help learners to solve problems of their lives. Instead of telling them the solutions 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 help them not only to solve the present problem, but the problems throughout their lives.

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