

CHAPTER 5

SUMMARY AND CONCLUSION

This chapter discusses the findings of the study. The purpose of the study was to examine the relationship between cognitive strategies and academic achievement of the students. Specifically, this study sought to investigate the metacognitive awareness and learning style preference of the higher secondary school students. Following this, recommendations are made for both future research and educational practice in the fields of metacognition and learning style preference.

The objectives of the present study were to determine the learning style preference and metacognitive awareness of higher secondary students from different types of schools in Coimbatore city and to examine whether there was any relationship among learning style preference, metacognitive awareness and the academic achievement of students. It also examined whether there was any significant difference in learning style preference and metacognitive awareness of students based on personal and academic variable and facilities available at home.

In order to determine the learning style preference and metacognitive awareness of higher secondary students descriptive statistics was used to portray the percentages, means and standard deviation for each of the learning style dimensions and for each of the components and sub components of metacognitive awareness. Correlation analysis was conducted to see whether students' achievement scores are related to learning style preference and metacognitive awareness. An independent samples t-test was done to see whether students metacognitive awareness score differ based on learning style preference, personal and academic variables and facilities available at home. Chi square analysis was conducted to find out whether there is any association between learning style preference of the students and the personal and academic variables and facilities available at home.

Educational Survey method was chosen for the present study. The sample selected for the present study consisted of 1005 Higher Secondary School students from government, corporation and private schools in and around Coimbatore city. The data collection instruments used in the study were a personal data sheet, an Inventory on Learning Style Preference and Metacognitive Awareness Inventory.

5.1 Findings of the Study

1. Percentage analysis revealed that 69 percentage of students were found to be active learners and 31 percentage of students were found to be reflective learners. Visual learning style was possessed by 38.9 percentage and 61.1 percentage were found to prefer verbal learning style. Coming to sensing-intuitive 53.2 percent were of intuitive type and 46.8 percentage of students were found to be sensing learners. Of the total 56.7 percentage of learners were of Sequential type whereas 43.3 percent were global learners.

2. The analysis of level of metacognitive awareness revealed that 67.36 percent of students were found to have average metacognitive awareness whereas 16.12 percent of students were found to possess below average level of metacognitive awareness and 16.52 possessed above average level of metacognitive awareness.

3. Percentage analysis of different dimensions of learning style preferences based on personal variables revealed that majority of the male students were preferring active(69%), visual(60.2), Intuitive (56.9%) and global (60.9%) learning styles, whereas majority of the female students were active, **verbal**, intuitive and **sequential** learners. Locale-wise analysis revealed that majority of the rural students prefer active, verbal, intuitive and sequential learning styles, whereas majority of urban students were found to be active, **visual**, **sensing** and sequential learners. Percentage analysis of learning style preferences based on the type of family to which the students belong to indicated that majority of the students from nuclear family were active, verbal, intuitive and sequential learners, whereas the students from joint family preferred active, verbal, intuitive and **global** learning styles. Income-wise analysis brought out the results that irrespective of the monthly income of the family majority of the students preferred active and sequential styles in Active-Reflective and Sequential-Global learning style dimensions. In Visual – Verbal dimension the students from **High income group preferred Visual learning style** and other groups (EWS, LIG, and MIG) preferred Verbal learning style. In Sensing – Intuitive dimension all students preferred intuitive learning style except students from **MIG** , who preferred **sensing learning style**.

4. Percentage analysis of different dimensions of learning style preferences based on academic variables revealed that majority of the Tamil medium students were active, verbal, intuitive and sequential learners, whereas English medium students were active,

visual, sensing and sequential learners. Majority of students considered in the present study from different types of schools were found to prefer active learning style. In other dimensions, **Private school students** were **Visual**, whereas students from Government and Corporation schools were verbal learners. **Global** learning style was preferred by **Government school students** and corporation and private school students were sequential learners. Percentage analysis carried out on learning style preferences of students based on groups of study revealed that majority of the students were active and verbal learners irrespective of the group in which they study. In Sensing –intuitive dimension majority of the **mathematics and science group students were sensing learners** and in Sequential-Global learning style dimension, **History and vocational group students preferred Global learning style** whereas Mathematics , Science Computer Science and Commerce group students preferred Sequential leaning style.

5. Percentage analysis of different dimensions of learning style preferences based on facilities available at home revealed that irrespective of availability of separate study room and computer facility, majority of the students were found to be active verbal, intuitive and sequential learners. When students with Internet access facility were analysed it was seen that majority of the students were found to be active, visual, intuitive and sequential learners and students without Internet access were active ,**verbal**, intuitive and sequential learners. Analysis of learning style preferences of students based on newspaper reading habit revealed that students who read newspaper were active, verbal, intuitive and sequential learners and who do not read newspaper were active, verbal, **sensing** and sequential learners.

6. The results of percentage analysis of students' learning style preference based on level of metacognitive awareness revealed that irrespective of the difference in levels of metacognitive awareness majority of the students were active, verbal, intuitive and sequential learners.

7. Correlation analysis of learning style preference and academic achievement of students showed that the visual and sensing learning style preferences are positively correlated to academic achievement and verbal and intuitive learning style preferences are negatively correlated to academic achievement and no statistically significant correlation

was seen between academic achievement and active, reflective, sequential and global learning styles.

8. Statistical analysis of the relationship between metacognitive awareness and academic achievement yielded negligible correlations in all components and subcomponents of metacognitive awareness except for the component Regulation of Cognition and its sub component Evaluation. Pearson's correlation coefficient value 0.70 and 0.636 for Regulation of Cognition and Evaluation respectively demonstrates a statistically significant positive correlation with academic achievement revealing that students who could regulate their cognition and know how to evaluate and use appropriate strategies for their learning can perform better in their academic activities.

9. t-test results revealed that there is a highly significant difference in the total metacognitive awareness, regulation of cognition, planning, debugging strategies and evaluation of active and reflective learners and active learners were found to be better in these metacognitive skills..

10. The t-test results revealed that there is a highly significant difference in the total metacognitive awareness, knowledge of cognition, regulation of cognition and all the sub components of metacognitive awareness of visual and verbal learners and the visual learners were found to possess better metacognitive awareness.

11. Highly significant difference was found in the total metacognitive awareness, knowledge of cognition, regulation of cognition and all the sub components of metacognitive awareness of sensing and intuitive learners and the sensing learners were found to have better metacognitive awareness.

12. The *t* results revealed that sequential learners had better metacognitive awareness, knowledge of cognition, regulation of cognition, declarative knowledge, procedural knowledge conditional knowledge, planning, information management strategies, comprehension monitoring debugging strategies and evaluation.

13. Chi square analysis conducted to find out if there is any association between learning style preferences and personal variables revealed that there was a significant association between learning style preference and gender for sensing-intuitive and sequential- global learning styles. Learning style preference namely visual-verbal, sensing-

intuitive were significantly associated with the locality of the students. Type of family namely nuclear family and joint family was found to be significantly associated with learning style preference of students namely active-reflective and sequential-global. Monthly income of the family and learning style preference namely visual-verbal was found to have a statistically significant association.

14. Chi square analysis conducted to find out if there is any association between learning style preferences and academic variables revealed that there was a significant association between visual-verbal, sensing-intuitive and sequential-global learning style preferences and medium of instruction. Groups of study of the students and learning style preference namely visual-verbal and sequential-global were found to have a statistically significant association. It was also seen from results of the χ^2 analysis that there is significant association between the learning style preference namely visual-verbal, sensing-intuitive and sequential-global and the types of school in which the students study.

15. Learning style preference namely sequential-global was found to have a statistically significant association with the availability of separate study room facility at home. Visual-verbal learning style of students was found to have a statistically significant association with availability and use of computer and internet at home by the students. It was also seen from the χ^2 value (3.861) that sensing and intuitive learning style preference is significantly associated with news paper reading habit of the students.

16. The differential analysis conducted to find out the statistically significant difference in metacognitive awareness based on the personal variables indicated that there was a significant difference in the metacognitive awareness and regulation of cognition, conditional knowledge, planning, information management strategies, comprehension monitoring and evaluation of male and female students. The mean values indicated that male students were better in all these metacognitive abilities. Locale-wise comparison of metacognitive awareness revealed that there was no significant difference in metacognitive awareness and its components of rural and urban students, except for the subcomponent evaluation and the rural students were found to possess better evaluation strategies. Students from joint and nuclear family were not found to have significant difference in the metacognitive awareness except for the subcomponent conditional knowledge. Students from nuclear family was found to possess better conditional knowledge than the students from joint family.

17. ANOVA results indicated that there is a significant difference in the metacognitive awareness, knowledge of cognition, regulation of cognition, conditional knowledge, planning, debugging strategies and evaluation of students with different family income. Tukey test revealed that students belonging to the Lower Income Group (LIG) with monthly income of Rs.12001 - Rs 18000 were found to have better metacognitive awareness, knowledge of cognition, regulation of cognition, conditional knowledge, planning, debugging strategies and evaluation than the other group of students.

18. The differential analysis conducted to find out the difference in metacognitive awareness based on the academic variables using t-test revealed that Tamil medium students were found to possess better metacognitive awareness, knowledge of cognition, regulation of cognition, procedural knowledge, planning, information management strategies, comprehension monitoring, debugging strategies and evaluation than the English medium students.

19. ANOVA results indicated that there is a significant difference in the total metacognitive awareness, knowledge of cognition, regulation of cognition and the sub components of metacognitive awareness of students studying in Government, Corporation and Private schools. Post hoc analysis using Tukey test revealed that govt. school students had better metacognitive awareness, knowledge of cognition, regulation of cognition, declarative knowledge, procedural knowledge, conditional knowledge, planning, information management strategies, comprehension monitoring, debugging strategies and evaluation than the students from corporation and private school.

F-test brought out the results that there was a highly significant difference in the metacognitive awareness and its components and subcomponents of students specializing in different groups of study. Tukey test revealed that Vocational group students possess better metacognitive awareness, knowledge of cognition, regulation of cognition, planning, information management strategies and comprehension monitoring whereas mathematical group students had better declarative knowledge and conditional knowledge. History group students had better procedural knowledge, debugging strategies and evaluation than other group of students.

20. The differential analysis conducted to find out the difference in metacognitive awareness based on the availability of facilities at home revealed that the availability of

separate study room and computer facility at home was not found to contribute towards the metacognitive awareness, its components and subcomponents of students.

t- test results revealed that there is a statistically significant difference in the total metacognitive awareness, knowledge of cognition and declarative knowledge of students who have internet access at home and who do not have internet access at home. The mean values suggested that the students who do not have internet at home were found to possess better metacognitive awareness, knowledge of cognition and declarative knowledge.

It was seen from the t-test results that there was a significant difference in the total metacognitive awareness and regulation of cognition of students who read newspaper and who do not read newspaper. The metacognitive awareness and regulation of cognition was better for the students who read newspaper daily. The procedural knowledge, planning and information management strategies of students who read newspaper daily were found to be better than the students who do not read news paper daily.

5.2 Recommendations

As it is seen from the present study, that the academic achievement is positively related to visual and sensing learning style preference it could be concluded that academic achievement is influenced by learning style preference, hence it is the duty of the Policy makers and the Academic bodies to give ample experience to prospective teachers and teachers in service to get trained in different instructional methods like class discussions, hands on activities, assignments, reading materials, visual displays, audio materials and help students to work individually, in small groups and in large groups that caters to the needs of students with different learning style preferences.

In addition, the researcher recommends identifying students' learning styles early in their academic venture. The purpose of identifying the students' learning style early in their academic life would be to alert the student to his or her potential academic weaknesses and to teach them mechanisms by which to cope and/or adapt their learning. By determining students' learning styles and helping educators communicate, interact, and teach more effectively to those styles, the academic success of students can be enhanced. Special training should be given to the teachers to identify the learning style preference of the students and their own teaching style.

The results of the current study suggested that students who have the habit of reading newspaper daily had better metacognitive awareness. Therefore it is recommended that heads of the institutions and parents should motivate the students to read newspaper and provide them newspapers daily.

Furthermore the present study reveal that metacognitive awareness of the students from different family income group differ significantly and it is seen that students from low income group fair better in all metacognitive abilities than the students from higher income group. Parents of students at every level should play a very crucial role in enhancing the metacognitive awareness of their wards by promoting strategies to construct and regulate their knowledge. 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 namely existing knowledge and acquiring knowledge along with the regulation of his cognitive processes, he can achieve success. It is better to give compulsory orientation on metacognitive awareness to the parents, teachers and students by the institutions and policy makers.

5.3 Suggestions for Further Research

The results of this study provide potential insights for future research.

1. Studies can be conducted on teaching styles and whether they match the students learning style preference. Matching teaching styles may improve academic achievement of students.
2. Longitudinal studies can be conducted to understand whether the meta cognitive awareness of students significantly increases with advancing academic structure and critical thinking of the students.
3. This study was confined to only fourteen schools in Coimbatore district. This study may be conducted in regional and state level.
4. Similar study may be done with high school students and college students. Studies may be conducted at various school level in future.

5. In the present study, the learning style inventory was developed, only on the basis of Active-Reflective, Visual-Verbal, Sensing-Intuitive and Sequential-Global dimensions. In future, studies with other learning styles like auditory and kinesthetic, convergent, divergent can be done, and their relation to different cognitive strategies can be carried out.

Conclusion

The present study conducted on metacognition and learning styles helped to gain an initial understanding of learning style preference and metacognition and its influence on academic achievement. The development of metacognitive awareness or metacognitive skills is critical in the preparation of learners for positive engagement in their lifelong learning. Understanding of the learning style preference of the students will help teachers to select the appropriate method which in turn improves the academic achievement of the students. The findings of the study provides us a better understanding of metacognitive awareness and learning style preference, and furthermore will help in the development of educational interventions that foster the type of metacognitive skills and learning style preference that enable the learners to develop in to program with in real world learning contexts.