CHAPTER VI

DISCUSSION OF RESULTS
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6.0.0 INTRODUCTION

In chapter V the analysis of data along with interpretation and findings were presented. The results without discussion do not convey the full meaning. In this chapter the results are followed by discussion. The objective wise discussion is given under different captions as follows.

6.1.0 COMPARISON OF ADJUSTED MEAN SCORES OF ACHIEVEMENT IN SCIENCE OF THE EXPERIMENTAL AND CONTROL GROUP BY CONSIDERING PRE-ACHIEVEMENT IN SCIENCE AS COVARIATE

The second objective of the study was “To compare the adjusted mean scores of Achievement in Science of the student of the experimental and control group by considering Pre- Achievement in Science as covariate.” In the present study the effectiveness of Instructional Material was studied in terms of Achievement. To study the effectiveness of the Instructional Material Achievement test comprising of different aspects of Science was constructed to get real reflection of the effect of treatment.

The finding of this objective revealed that Instructional Material was found to be effective in terms of Achievement in Science when Pre – Achievement in Science of students was taken as covariate. Various reasons may be responsible for such a finding. Discussion regarding this finding is given below.

6.1.1. Effectiveness of Instructional Material In Terms of Achievement.

The developed Instructional Material was found to be effective in terms of the Achievement of the students. This finding was supported by National Survey and Assessment of Instructional Material (1976), Talmadge & Eash (1979), Weinstein
The reasons for such a finding may be as follows:

- The developed Instructional Material was designed in such a way that helped the students to learn according to their own pace.
- The language of the Instructional Material was also kept simple and easy to understand.
- Clear instructions were given in the Instructional Material, which were easily understood by the students.
- Various types of rules and examples included in Instructional Material provided wide opportunity to students for developing clear concepts and ideas regarding the subject.
- New information was always connected with the students' previous knowledge. The investigator had designed the Instructional Material in such a way that it was based on their previous knowledge. All these might have helped in strengthening the cognitive aspect of the students. As cognitive aspect becomes strong, the student's learning and understanding correspondingly become strong.
- The content of the Instructional Material was logically arranged, related to their syllabus & designed according to the level of the students to make learning effective. Due to this, they could express their ideas easily. Hence, they scored high on Achievement test.
- Self learning module and activity based material helped to increase interest and concentration power. Consequently the students understood the content of Instructional Material easily.
- To make the material interactive and thought provoking various interactive questions and thinking questions were included in the Instructional Material which helped the students to enhance their Achievement.
- The major reason behind the greater Achievement of the students might be the new approach to learning. Generally students learn through lecture or text-book which is not psychologically sequenced. There always remains less scope of interaction, so the students feel bored. In Instructional Material there was
opportunity to interact, due to various thought provoking questions, exercises & class room discussions. It attracted most of the students and verbal & non-verbal items, created interest amongst them. It has also broken the trend of stereotype traditional method of teaching & this new trend of instruction might be the reason for better Achievement.

- The Instructional Material consisted of attractive practice tasks in the form of playing games, practical, discussion on real objects etc might have enhanced their Achievement.
- The items of Instructional Material were systematic, well described and arranged from simple to complex which created interest amongst the students to study through Instructional Material and this ultimately might have enhanced their Achievement.
- Similarly assignments were incorporated with the Instructional Material. Assignments were knowledge based and application based thus assignments might have enhanced understanding of the subject matter in a better way.

All the above reasons indicated that the Instructional Material was found to be effective in terms of Achievement.

6.2.0 COMPARISON OF THE ADJUSTED MEAN THINKING SKILL SCORES OF IDENTIFYING PROS/CONS OF THE STUDENTS OF EXPERIMENTAL AND CONTROL GROUP BY CONSIDERING PRE-THINKING SKILL AS COVARIATE

The third objective of the study was to compare the adjusted mean Thinking Skill scores of Identifying Pros/Cons of the students of experimental and control group by considering Pre- Thinking Skill scores as covariate. The finding of this objective is “Instructional Material was found to be effective in terms of IPC Thinking Skill when Pre - Thinking Skill of IPC was taken as covariate.”

The reasons behind such findings might be that teaching through Instructional Material might have provided a new way of teaching, totally, different from traditional method and this innovative method might have created interest amongst students. The
designed Instructional Material was based on IPC skill which helped students in identifying the concept, and involves attending to those attributes that are absolutely essential to the meaning and disregarding those attributes which are not absolutely essential to the meaning.

Another reason might be that the content of the Instructional Material was logically sequenced keeping in view the psychological principle like the Principle of Individual Differences. By teaching through Instructional Material learner's attention is drawn to similarities and differences. The Instructional Material was much enriched content wise and quite interesting as it included exercises like identification of statements, comparison of various similar and dissimilar objects, ideas and concepts. The Instructional Material also consisted of relevant lesson plans and different types of exercises designed on the basis of specific criteria applied in developing the IPC. Apart from that use of diagrams, sketches, mind mapping, pictorial representation of different topics created interest amongst students. Charts incorporated in Instructional Material were clear and large enough to have an impact as Dale (1969) has remarked that “one picture may be worth a thousand words.” Varied pictures and 3D objects motivated the students, modified their interests, attitudes and opinions. The most important aspects of the selected pictures, objects, diagrams were that they were closely related to the concept of the topics and showing a harmonious relationship with words in order and thus proved as an effective teaching instrument. Hence it has been observed that systematic use of lesson plans, different types of exercises varied pictures, video and real objects made the subject matter clear and appealing to the students of diversified background and varying abilities. Students showed maximum participation in teaching learning process and it helped in the development of IPC skill amongst students.

6.3.0 EFFECT OF TREATMENT, INTELLIGENCE AND THEIR INTERACTION ON ACHIEVEMENT IN SCIENCE OF STUDENTS BY CONSIDERING PRE-ACHIEVEMENT IN SCIENCE AS COVARIATE

The fourth objective of the study was "To study the effect of treatment, Intelligence and their interaction on Achievement in Science of students by considering Pre-
Achievement in Science as covariate." The discussion regarding each one of them is given under different captions.

6.3.1 Effect of Treatment on Achievement in Science of Students

The results related to this objective indicated that there was significant effect of treatment on Achievement in Science of students. The Experimental Group was found to be superior to Control Group in enhancing Achievement. The reason behind this result is given under caption 6.1.1.

6.3.2 Effect of Intelligence on Achievement of Students

As per the results the Above & Average and Below Average Intelligent students were found to possess Achievement in Science to the same level when Pre Achievement in Science was taken as co-variate. Experimentally it has been proved by many researchers that there are some variables which directly affect the Achievement of the students. The investigator studied the Achievement of the students of both the groups by considering Intelligence as covariate. Intelligence plays a very important role in studies. A student, who is intelligent, is able to grasp and understand the concept of anything very quickly and achieve better results than others. His/her concept clarity is more as compared to below average intelligence students. An intelligent student can think rationally and can deal effectively into new situations of the environment.

Wechsler defines, Intelligence as the "Aggregate or global capacity of an individual to act purposefully, to think rationally and to deal effectively with his environment". In the present study students belonging to both the groups above average Intelligence and below average Intelligence were found to have similar Achievement in Science when Pre - Achievement in Science was taken as covariate. It reveals that Achievement in Science of students belonging to above & average and below average levels did not differ significantly when Pre Achievement in Science was taken as covariate. A lot of studies have been conducted to explore the relationship between academic Achievement and Intelligence from grade VIII to college level.
Following studies indicated that Intelligence has proved to be one of the most important factors working behind the Achievement of students. Kulshrestha (1956), Rastogi (1964), Rao (1965); Sharma (1978), Hunter & Hunter (1984), Marley Walkins (1984), The American Psychological Association (1975), Chhabra (1995), Ali (1998), Joshi (1999) etc, studied the relationship between Intelligence and Achievement and found Intelligence responsible for enhancing the Achievement of students. All of these have reported a positive and significant relationship between academic Achievement and Intelligence except Choudhary (1971) who has reported a positive and significant relationship in between these two variables in case of females, whereas, no relationship was found to exist between these two variables in case of male subjects.

The present finding is not supported by the past researches. One of the reasons might be that Pre Achievement in Science was taken as co-variate. It might have helped in taking care of differences in Achievement of Science of Above & Average and Below Average Intelligence groups. In both the two groups, there were students from Experimental as well as Control group. Due to this composition the mean scores of Achievement in Science of Above & Average and Below Average Intelligence groups were not found to be significantly different. Further it is not necessary that Above & Average intelligent students have higher Achievement. It is quite possible that they might have lacked the necessary motivation to perform well. They might not have got proper learning environment at home or school. On the other hand the Below Average Intelligent students might have performed well because there was adequate motivation from inside, from peers and also if they are encouraged to perform well by teachers, tutors or parents at home. It is also seen that the students who have a low academic profile perform exceedingly well in the competitive examination and in their careers. This further supports the point that Intelligence and Achievement might not always be positively correlated. Also the Achievement test given to the students have mostly knowledge based questions. The performance in knowledge based test may not be related to Intelligence. Here other factors like rote memorization power of the child and learning techniques adopted by the child might have contributed more to the Achievement. Lastly the general level of Intelligence of students has also improved due to media exposure and parents have become more conscious about reasoning and...
thinking abilities of their children. There are different types of games, websites, books, etc., that promote intelligence in general. This might have given rise to the present finding.

6.3.2 Effect of Interaction between Treatment and Intelligence on Achievement in Science of Students

The result related to this objective indicated that there was no significant influence of interaction between Treatment and Intelligence on Achievement in Science when Pre-Achievement in Science was taken as covariate. The reason for this finding might be that the achievement is totally dependent on the treatment.

This means treatment can be useful to both Below Average and Above Average Intelligent students. It indicates that the treatment cares to all the students irrespective of their level of Intelligence. The students of above average Intelligence could definitely benefit more from the treatment as it helped them by providing a platform to share their views about a topic and know other’s view points to fill in the gaps of their understanding about the concept. So use of Instructional Material must been bonus for them. On the contrary the students of below average Intelligence lacked the ability to analyze and understand the content. So the use of Instructional Material could have built upon or improved their concepts by discussion with the students of varied ability levels. This treatment must have provided a platform to them to get exposed to different ideas related to a topic and hence improved their understanding of a topic. Group interaction generates enthusiasm and creates such a learning environment so that the students are intrinsically motivated to achieve more in the end. Thus treatment can be effective for both the categories. The teacher usually attributes the low Achievement of a child to his low IQ level but by treatment through Instructional Material based on IPC the teacher can minimize its effect. Hence there was no interaction effect of treatment and Intelligence on Thinking Skill of IPC of students.
The fifth objective of the study was “To study the effect of treatment, Personality and their interaction on Achievement in Science of students by considering Pre-Achievement in Science as covariate.” The discussion regarding each one of them is given under different captions.

6.4.1 Effect of Treatment on Achievement in Science of Students

The results related to this objective indicated that there was significant effect of treatment on Achievement in Science of students. The Experimental Group was found to be superior to Control Group in enhancing Achievement. The reason behind this result is given under caption 6.1.1.

6.4.2 Effect of Personality on Achievement of Students

Finding of this objective indicates that Extrovert and Introvert students were found to possess Achievement in Science to the same level when Pre-Achievement in Science was taken as covariate. There might be various reasons for this finding. One reason might be that the students included in the sample of the study were well adjusted in the school as well as with their classmates. In case the student was new, the Personality type might have played a role. Although the students were divided into two groups with respect to Personality namely, introvert and extrovert, yet the differences might not have been so remarkable that it influenced the Achievement in Science. Since the Pre-Achievement in Science was taken as covariate, it might have helped in taking care of differences in Achievement in Science of extrovert and introvert students. Further in each extroversion group and introversion group, there were students who were taught with and without Instructional Material the composition of groups might have resulted in non-significant difference in Achievement in Science of students belonging to Extroversion and Introversion.
groups when Pre-Achievement in Science was taken as covariate. It reveals that irrespective of Personality of students, their Achievement in Science did not differ significantly.

This finding is not supported by Fatehpuria (1966), Bhatnagar (1967), Shrivastav (1974), Bayti (1965), Seetha (1975), Beedawat (1976), Mathew (1976), Pushpita (1977), Ramaswamy (1991) and Nagailinkim (1991) who found that most of the traits of Personality, like autonomy, dominance, endurance, aggression, reservedness, outgoing Personality, sociability, impulsiveness, enthusiasm, emotional stability, self esteem, submissiveness, adventurous, tender mindness, independence, self orientation, and futurism were positively related to Academic Achievement. Further Singh (1965), Vindhu (1968), Adaval, Kakkar and Agrawal (1961), Jha (1970), Menon (1972), Namrta (1992), Behra (2002) and Duangnokhon (2003) explored the relationship between the Academic Achievement and extroversion-neuroticism and extroversion-introversion. This did not reflect any definite trend. In the present study the Achievement in Science was found to be independent of Personality when Pre-Achievement in Science of students was taken as covariate.

6.4.3 Effect of Interaction between Treatment and Personality on Achievement in Science of Students

Finding of this objective indicates that there was no significant influence of interaction between Treatment and Personality on Achievement in Science when Pre-Achievement in Science was taken as covariate. This finding revealed that irrespective of Personality characteristics, the Achievement in Science of the students can be improved equally well by using Instructional Material when pre Achievement in Science was taken as covariate. During the treatment via Instructional Material, the introvert students got a chance to interact with students of all levels in a group. Hence in that process, they got knowledge about the content, which strengthened their divergent thinking in Science. Also when the group accepts the view point of introvert student, then a sense of Achievement develops. It works on the psychology of child,
who then feels motivated and confident about his/her performance. This results in increased interest and positive attitude towards the subject and teacher, and hence gets reflected in better academic Achievement. The extrovert students, who might be good in communicating their ideas, get a platform to share and at the same time be a good listener to accept the viewpoint of their classmates. This process of interaction and discussion subsequently resulted in filling the gaps of knowledge which a student has. Hence the additional knowledge gained by a child might have resulted in better academic Achievement. And might be due to this there is no significant effect of interaction between treatment and Personality on Achievement in Science of student.

6.5.0 EFFECT OF TREATMENT, CREATIVITY AND THEIR INTERACTION ON ACHIEVEMENT IN SCIENCE OF STUDENTS BY CONSIDERING PRE-ACHIEVEMENT IN SCIENCE AS COVARIATE

The sixth objective of the study was to study the effect of treatment, Creativity and their interaction on Achievement in Science of students by considering Pre-Achievement in Science as covariate. The discussion regarding each one of them is given under different captions.

6.5.1 Effect of Treatment on Achievement in Science of Students

The result in respect of effect of Treatment on Achievement in Science of students by considering Pre-Achievement in Science as covariate and the reason is the same as given in Caption 6.1.1.

6.5.2 Effect of Creativity on Achievement of Students

The finding of this objective is that the High and Low Creative students were found to possess Achievement in Science to the same level when Pre-Achievement in Science was taken as co-variate. It indicates that irrespective of Creativity of students, their Achievement in Science did not differ significantly. There might be various reasons for such a finding. One reason might be that the Pre-Achievement was taken as co-variate. Although the students were divided into two groups with respect to Creativity namely, High and Low creative, yet
the differences might not have been so remarkable that it influenced the Achievement in Science. Since the pre Achievement in Science was taken as covariate, it might have helped in taking care of differences in Achievement in Science of high and low creative students. Further in each high and low creative group, there were students who were taught with and without Instructional Material. The composition of groups might have resulted in non-significant difference in Achievement in Science of students belonging to High and Low creative groups when they were equated with respect to Pre-Achievement in Science.

This finding is not supported by Joshi (1989), Singh (1989), Singh (1990), Afshan (1991), Shrivastava, Sushila and Srilatha (1992). Researchers reported that all the four groups (management, medicine, engineering and law) were found to be significantly different on the various measurements of Creativity. One found that the success of female adolescents on anagram task learning was significantly influenced by their Creativity components. Another finding was that the non-scheduled caste students under Science group were significantly higher in Creativity than their counterparts of rural art groups. This did not reflect any definite trend. However, in the present study the Achievement in Science was found to be independent of Creativity when Pre-Achievement in Science of students was taken as covariate.

6.5.3 Effect of Interaction between Treatment and Creativity on Achievement in Science of Students

There was no significance influence of interaction between Treatment and Creativity on Achievement in Science when Pre-Achievement in Science was taken as covariate. It indicates that, irrespective of Creativity characteristics, the Achievement in Science of the students can be improved equally well by using Instructional Material based on IPC when Pre Achievement in Science was taken as covariate. The reason might be that during the treatment, the low creative students got a chance to interact with students of all levels in a group. Hence in that process, they got knowledge about the
content, which strengthened their divergent thinking in Science. Also when the group accepts the viewpoint of low creative students, then a sense of Achievement develops. It works on the psychology of child, who then feels motivated and confident about his/her performance. This results in increased interest and positive attitude towards the subject and teacher, and hence gets reflected in better academic Achievement.

The high creative students, who might be good in thinking new ideas, get a platform to share and at the same time be a good listener to accept the viewpoints of their classmates. This process of interaction and discussion subsequently results in filling the gaps of Creativity which a student has. Hence the additional knowledge gained by a child may result in better academic Achievement.

Lastly the general level of Creativity of students has also improved due to media exposure and parents have become more conscious about the Creative abilities of their children. There are different types of games, puzzles, web sites, books, art and craft, exhibitions, projects kind of activities etc; that promote Creativity in general. This might have given rise to the present finding.

6.6.0 EFFECT OF TREATMENT, TOLERANCE OF AMBIGUITY AND THEIR INTERACTION ON ACHIEVEMENT IN SCIENCE OF STUDENTS BY CONSIDERING PRE-ACHIEVEMENT IN SCIENCE AS COVARIATE

The seventh objective of the study was to study the effect of treatment, Tolerance of Ambiguity and their interaction on Achievement in Science of students by considering Pre-Achievement in Science as covariate. The discussion regarding this is given under different captions.

6.6.1 Effect of Treatment on Achievement in Science of Students

The result in respect of effect of Treatment on Achievement in Science of students by considering Pre-Achievement in Science as covariate and the reason is the same as given in Caption 6.1.1.
6.6.2 Effect of Tolerance of Ambiguity on Achievement of Students

Achievement in Science was found to be independent of level of Tolerance of Ambiguity of students when Pre-Achievement in Science of students was taken as covariate. It reveals that Achievement in Science of students belonging to low, moderate and high level of Tolerance of Ambiguity did not differ significantly when Pre Achievement in Science was taken as covariate. One of the reasons might be that the pre Achievement in Science was taken as covariate. It might have helped in taking care of differences in Achievement in Science of students with low, moderate and high level of Tolerance of Ambiguity. Then although the students were divided into three groups as low, moderate and high with respect to Tolerance of Ambiguity yet the differences might not have been so remarkable that it could influence the Achievement in Science.

Although all the three groups of Tolerance of Ambiguity included the students who were taught using Instructional Material as well as Lecture Method. This might have been responsible for improving the Achievement in Science of students irrespective of their level of Tolerance of Ambiguity. In all the three groups, there were students from Experimental as well as Control groups. Due to this composition the mean Achievement in Science of groups with low, moderate and high level of Tolerance of Ambiguity were not found to be significantly different. This finding is supported by Lulla (2012), who reported that students belonging to low, moderate and high levels of Tolerance of Ambiguity were found to have similar Achievement in Science when Pre-Achievement in Science was taken as covariate.

Further it is not necessary that the student with high level of Tolerance of Ambiguity have higher Achievement. It is quite possible that they might lack the other necessary skills to perform well. They might not have got proper learning environment at home or school. This could have resulted in lack of interest and hence no improvement in Achievement scores was seen. On the other hand it is quite possible that the students with low level of Tolerance of Ambiguity must have been motivated enough by the various features of Instructional Material. This might have developed some Achievement oriented behaviors as trying hard, attending class regularly, praising the efforts of others, and receiving help from...
one's group members. All these factors might have contributed in the scores of Achievement.

6.6.3 Effect of Interaction between Treatment and Tolerance of Ambiguity on Achievement in Science of Students

Achievement in Science was found to be independent of the interaction between Treatment and Tolerance of Ambiguity when Pre-Achievement in Science of students was taken as covariate. It reveals that, irrespective of level of Tolerance of Ambiguity, the Achievement in Science of students can be improved equally well by using Instructional Material based on IPC when Pre Achievement in Science was taken as covariate. This means the Instructional Material can be equally useful to students of high, moderate and low level of Tolerance of Ambiguity. It indicates that the treatment caters to all the students irrespective of their Tolerance of Ambiguity. The students of high Tolerance of Ambiguity could definitely benefit more from the treatment, it helped them to listen and understand the view points of their classmates. Thus, in the process of discussion and interaction during the steps of IPC, they might have built upon the concept and clarified doubts, if any. Whereas with the students of low Tolerance of Ambiguity, the group activities must have been structured so well that in the course of participation, they would have gained from the output of others which resulted in enhanced academic Achievement. Drawing boundaries could have been proved to be a valued activity to them because the content's success was based on it and by the fact that one's group mates will reward it. This might be reason for that finding.

6.7.0 EFFECT OF TREATMENT, STUDY HABITS AND THEIR INTERACTION ON ACHIEVEMENT IN SCIENCE OF STUDENTS BY CONSIDERING PRE-ACHIEVEMENT IN SCIENCE AS COVARIATE

The eight objective of the study was to study the effect of treatment, Study Habits and their interaction on Achievement in Science of students by
considering Pre-Achievement in Science as covariate. The discussion regarding them is given as follows.

6.7.1 Effect of Treatment on Achievement in Science of Students

The result in respect of effect of Treatment on Achievement in Science of students by considering Pre-Achievement in Science as covariate and the reason is the same as given in Caption 6.1.1.

6.7.2 Effect of Study Habits on Achievement of Students

Students belonging to different level of Study Habits were found to have similar Achievement in Science when Pre Achievement in Science was taken as covariates. It reveals that Achievement in Science of students belonging to different levels of Study Habits did not differ significantly when Pre Achievement in Science was taken as covariate. One of the reasons might be that the pre Achievement in Science was taken as covariate. In the present study the investigator studied the Achievement of students studying through Instructional Material with those studying through traditional method by taking Study Habits as a covariate. Study Habit has proved to be one of the important factors working behind the Achievement of the students. Both Study Habits and Achievement are highly correlated as a person with high level of Study Habits perceives himself to be knowledgeable, intellectually adequate, successful, satisfied, optimistic and as high achievers. Many studies have been conducted which show that Study Habits affect the Achievement of the students. These are by Prociuk and Breen (1974), Zimmerman and Pons (1986), Powell, Williams and Wechsler (2002), Ozsoy, Memis and Temur (2009), Mbah (2010) etc. They studied the relationship between Study Habits and Achievement and found Study Habits to be one of the important factors working behind the enhancement of the Achievement.

But present finding indicates that it is not necessary that the student with high level of Study Habits have higher Achievement. It is quite possible that they might lack the other necessary skills to perform well. They might not have
got proper learning environment at home or school. This could have resulted in lack of interest and hence no improvement in Achievement scores was seen. On the other hand it is quite possible that the students with low level of Study Habits must have been motivated enough by the various features of Instructional Material. This might have developed some Achievement oriented behaviors as trying hard, attending class regularly, praising the efforts of others, and receiving help from one’s group members. All these factors might have contributed in the scores of Achievement.

6.7.3 Effect of Interaction between Treatment and Study Habits on Achievement in Science of Students

Achievement in Science was found to be independent of the interaction between Treatment and Study Habits when Pre-Achievement in Science of students was taken as covariate. According to Good (1959): Study Habits are, (i) The tendency of a student to study when the opportunity is given. (ii) The student’s way of studying, whether systematic or unsystematic, efficient or inefficient etc. as much study habit is important for higher academic achievement of students as much it is important for their fruitful use of leisure time. The later aspect is also important for adults who are now in job, particularly for the teachers. The result of the present study showed that the developed Instructional Material was found to be effective in terms of Achievement of students. By studying through Instructional Material the overall mean Achievement scores of students were found to be higher as compared to the mean achievement scores of students studying through the traditional method when the mean Achievement scores of students were adjusted with respect to Study Habits. The reasons for significant higher Achievement by studying through Instructional Material have been discussed in detail under caption 6.1.1.
6.8.0 EFFECT OF TREATMENT, SELF CONFIDENCE AND THEIR INTERACTION ON ACHIEVEMENT IN SCIENCE OF STUDENTS BY CONSIDERING PRE- ACHIEVEMENT IN SCIENCE AS COVARIATE

The ninth objective of the study was to study the effect of treatment, Self-confidence and their interaction on Achievement in Science of students by considering Pre-Achievement in Science as covariate. The discussion regarding this is given under different caption.

6.8.1 Effect of Treatment on Achievement in Science of Students

The result in respect of effect of Treatment on Achievement in Science of students by considering Pre-Achievement in Science as covariate and the reason is the same as given in Caption 6.1.1.

6.8.2 Effect of Self Confidence on Achievement of Students

In the present study the investigator studied the Achievement of students studying through Instructional Material with those studying through traditional method by taking Self Confidence as a covariate. High and Low Self Confident students were found to possess Achievement in Science to the same level when Pre - Achievement in Science was taken as co-variate.

Self Confidence has proved to be one of the important factors working behind the Achievement of the students. Both Self Confidence and Achievement are highly correlated as a self confident person perceives himself to be socially competent, emotionally mature, intellectually adequate, successful, satisfied, optimistic, independent, self reliant, self-assured, forward moving, fairly assertive and having leadership qualities. According to Basvan (1975) "Self Confidence is an individual's perceived ability to act effectively in a situation to overcome obstacles to get things all right.

Many studies have been conducted which show that Self Confidence affects the Achievement of the students. They are by Dhamija (1985), Bhawalkar (1992), Ashton etal. (1992), Nayak (1998), Panickar (1992), Awasthi (2000) etc. They
studied the relationship between Self Confidence and Achievement and found Self Confidence to be one of the important factors working behind the enhancement of the Achievement. But present finding indicates that it is not necessary that the student with high level of Self Confidence have higher Achievement. Self Confidence refers to the faith in one’s own ability which enables the individual to be dependable, to rely upon his/her own judgment, not to be submissive and to feel himself/herself adequate to do the things he/she wants to do. As per the result the adjusted mean scores of Achievement of High and Low Self Confident students did not differ significantly.

6.8.3 Effect of Interaction between Treatment and Self Confidence on Achievement in Science of Students

There was no significant influence of interaction between Treatment and Self Confidence on Achievement in Science when Pre – Achievement in Science was taken as covariate.

The result of the present study showed that the developed Instructional Material was found to be effective in terms of Achievement of students. It can also be said that there was no significant effect of interaction between treatment and Self Confidence due to instructional approach. This may be because the Instructional Material was developed keeping in view the psychological principles like the principle of individual differences etc. this might have helped the students of both the categories i.e. High and Low Self Confidence to gain knowledge from the new type of approach. By studying through Instructional Material the overall mean Achievement scores of students were found to be higher as compared to the students studying through the traditional method when the mean Achievement scores of students were adjusted with respect to Self Confidence. The reasons for significant higher Achievement by studying through Instructional Material have been discussed in detail sunder caption 6.1.1.
6.9.0 EFFECT OF TREATMENT, INTELLIGENCE AND THEIR INTERACTION ON IPC THINKING SKILL OF STUDENTS BY CONSIDERING PRE- THINKING SKILL AS COVARIATE

The tenth objective of the study was to study the effect of treatment, intelligence and their interaction on development of Thinking Skill of Identifying Pros and Cons (IPC) of students by considering Pre- Thinking Skill of IPC as covariate. The discussion regarding each one of them is given under following captions.

6.9.1 Effect of Treatment on Thinking Skill of Students

Experimental Group was found to be superior to the Control Group in enhancing IPC Thinking Skill of students when Pre Thinking skill of IPC of students was taken as covariate. It indicates that treatment “Instructional Material was found to be effective in terms of IPC Thinking Skill when Pre - Thinking Skill of IPC was taken as covariate.” The reasons behind this finding are given under 6.2.0.

6.9.2 Effect of Intelligence on Thinking Skill of Students

Above Average and Below Average Intelligent students were found to possess Thinking Skill to the same level when Pre- Thinking Skill of IPC was taken as covariate. In the present study the investigator compared the development of Thinking Skill of IPC of students studying through Instructional Material with those studying through traditional method by considering Intelligence as covariate. Intelligence has proved to be one of the most important factors working behind the development of thinking and the skills related to thinking. Intelligence means having the ability to think. All the forms of thinking results in some kind of intelligent action. The terms "Intelligence" and 'Thinking' prove to be entirely synonymous and highly correlated. Some of the researches showing strong correlation between thinking, other sub-skills of thinking and Intelligence are given below.
Getzels and Jackson (1962), Wallach and Kogan (1965), Yamamoto (1965), Sternberg and Yang (2003) after an extensive research concluded that Intelligence is one of the most important factors which affect thinking directly. It is therefore, necessary to consider Intelligence as covariate in the present study.

Many researchers studied Intelligence and its relation with Achievement as Bhardwaj (1978), Chatterji (1983), Damle (1987), Gupta (1988), Mian (1988), Kohli (1989), Sharma (1989), Swami (1989), Yadav and Shrivastava (1989) and Kumari (1990) and found it positive and significant except Asthana (2007), who studied the effect of treatment, Intelligence and their interaction on post Thinking Skill of classification of students by considering pre Thinking Skill of classification as covariate and found that Thinking Skill of classification was independent of resultant of interaction between treatment and Intelligence when pre Thinking Skill of classification was taken as covariate.

In the present study students belonging to both the groups above average Intelligence and below average Intelligence were found to have similar Achievement in Science when Pre – Thinking Skill of IPC was taken as covariate. It reveals that Pre-Thinking Skill of IPC of students belonging to above average and below average levels did not differ significantly.

6.9.3 Effect of Interaction between Treatment and Intelligence on Thinking Skill of Students

There was no significant influence of interaction between Treatment and Intelligence on Thinking Skill when Pre-Thinking Skill of IPC was taken as covariate. In the present study it was found that the developed Instructional Material was significantly superior to traditional method when student’s mean post Thinking Skill of IPC scores were adjusted with respect to Intelligence. The reasons might be responsible for the significant development of the Thinking Skill of IPC of the students treated through Instructional Material are given in detail under caption 6.2.0..

Further, The effectiveness of treatment in the development of post Thinking Skill of IPC is due to the fact that most of the items of this Instructional Material were
related to the steps of IPC Thinking Skill so the abilities like discrimination, analyzing the object on the basis of their similarities and differences or on the basis of their common attributes etc. seem to help students gain high scores on post Thinking Skill of IPC test.

The treatment through Instructional Material helped in theoretical understanding, understanding of the concept and rules clearly. This got further strengthened through peer practice session and discussion. Students self initiated efforts to learn through Instructional Material also contributed a lot. Due to this the treatment might have been found to develop significantly the Thinking Skill of IPC of the students.

6.10.0 EFFECT OF TREATMENT, PERSONALITY AND THEIR INTERACTION ON THINKING SKILL OF STUDENTS BY CONSIDERING PRE- THINKING SKILL AS COVARIATE

The eleventh objective of the present study was to study the effect of treatment, Personality and their interaction on development of Thinking Skill of Identifying Pros and Cons of students by considering Pre- Thinking Skill of IPC as covariate. The discussion regarding each one of this is given under different captions.

6.10.1 Effect of Treatment on Thinking Skill of Students

The result in respect of effect of Treatment on IPC Thinking Skill by considering Pre–Thinking Skill as covariate and the reason are the same as given in Caption 6.2.0.

6.10.2 Effect of Personality on Thinking Skill of Students

Extrovert and Introvert Personality students were found to possess Thinking Skill to the same level when Pre- Thinking Skill of IPC was taken as covariate. It indicates that irrespective of Personality of students, their Thinking Skill of IPC did not differ significantly. The highly extroverts are recognized as sociable, outgoing, impulsive, optimistic and jolly people while the introverts are recognized as quite introspective,
reserved, reflective, disciplined and well-ordered people. The present finding is not supported by many researchers, who found that most of the traits of Personality were positively related to the development of Thinking Skills. However in the present study the development of Thinking Skill of IPC was found to be independent of Personality when Pre-Thinking Skill of IPC was taken as covariate.

There might be various reasons for this. One reason might be that the students included in the sample of the study were well adjusted in the school as well as with their classmates. In case the student was new, the Personality type might have played a role. Although the students were divided into two groups with respect to Personality namely, introvert and extrovert, yet the differences might not have been so remarkable that it influenced the development of Thinking Skill of IPC. Further the pre Thinking Skill of IPC was taken as covariate. It might have helped in taking care of differences in Achievement in Science of Extroverts and Introverts. Further in each extroversion group and introversion group, there were students who were taught with and without Instructional Material. The composition of groups might have resulted in non-significant difference in Achievement in Science of students belonging to Extroversion and Introversion groups when they were equated with respect to Pre-Thinking Skill of IPC.

6.10.3 Effect of Interaction between Treatment and Personality on Thinking Skill of Students

There was no significant influence of interaction between Treatment and Personality on Thinking Skill when Pre-Thinking Skill of IPC was taken as covariate. It indicates that irrespective of Personality characteristics, the Thinking Skill of IPC of the students can be improved equally well by using Instructional Material based on IPC when Pre-Thinking Skill of IPC was taken as covariate. The introvert students got a chance to interact with students of all levels in a group. Hence in that process, they produced knowledge about the content, which strengthened their divergent thinking. Also when the group accepts the view point of introvert student, then a sense of Achievement develops. It works on the psychology of child, who then feels motivated...
and confident about his/her performance. This results in increased interest and positive attitude towards the subject and the teacher, and hence got reflected in better Thinking Skill of IPC development. The extrovert students, who might be good in communicating their ideas, get a platform to share and at the same time be a good listener to accept the viewpoints of their classmates. This process of interaction and discussion subsequently results in filling the gaps of knowledge which a student has. Hence the additional knowledge gained by a child may result in better Thinking Skill of IPC development.

6.11.0 EFFECT OF TREATMENT, CREATIVITY AND THEIR INTERACTION ON THINKING SKILL OF STUDENTS BY CONSIDERING PRE-THINKING SKILL COVARIATE

The twelfth objective of the study was to study the effect of treatment, Creativity and their interaction on development of Thinking Skill of Identifying Pros and Cons of students by considering Pre-Thinking Skill of IPC as covariate. The discussion regarding each one of them is given under following captions.

6.11.1 Effect of Treatment on IPC Thinking Skill of Students

The result in respect of effect of Treatment on IPC Thinking Skill by considering Pre-Thinking Skill as covariate and the reason are the same as given in Caption 6.2.0.

6.11.2 Effect of Creativity on Thinking Skill of students

High and Low Creative students were found to possess IPC Thinking Skill to the same level when Pre-Thinking Skill of IPC was taken as covariate. It indicates that irrespective of Creativity of students, their Thinking Skill of IPC did not differ significantly. However in the present study the Thinking Skill of IPC was found to be independent of Creativity when Pre-Thinking Skill of IPC was taken as covariate. There might be various reasons for this. One reason might be that the Pre-Thinking
Skill of IPC was taken as co-variate. Although the students were divided into two groups with respect to Creativity namely, high and low creative, yet the differences might not have been so remarkable that it influenced the development of Thinking Skill of IPC. Creativity generally resembles divergent thinking. As the creative student will have divergent thinking so he/she will be able to think more pros and cons as compared to a normal student. They can create pros and cons via their Creativity by thinking in divergent sides. Original and unique ideas can give direction to the decision according to themselves. But the outcome of the study shows that it is not always necessary.

Since the Pre Thinking Skill of IPC was taken as covariate, it might have helped in taking care of differences in Thinking Skill of IPC of high and low creative. Further in each high and low creative group, there were students who were taught with and without Instructional Material. The composition of groups might have resulted in non-significant difference in Thinking Skill of IPC of students belonging to High and Low creative groups when they were equated with respect to Pre-Thinking Skill of IPC.

6.11.3 Effect of Interaction between Treatment and Creativity on Thinking Skill of Students

There was no significant influence of resultant of interaction between Treatment and Creativity on Thinking Skill when Pre-Thinking Skill of IPC was taken as covariate. Further, irrespective of Creativity characteristics, the Thinking Skill of IPC of the students can be improved equally well by using Instructional Material based on IPC when Pre Thinking Skill of IPC was taken as covariate. The Low creative students got a chance to interact with students of all levels in a group. Hence in that process, they procured knowledge about the content, which strengthened their divergent thinking in Science.

Also when the group accepts the view point of low creative student, then a sense of Achievement develops. It works on the psychology of child, who then feels motivated and confident about his/her, performance. This results in increased interest and positive attitude towards the subject and the teacher, and hence got reflected in
better scores of Thinking Skill of IPC. The high creative students, who might be good
in thinking new ideas, got a platform to share and at the same time be a good listener
to accept the view points of their classmates. This process of interaction and
discussion subsequently results in filling the gaps of Creativity which a student has.
Hence the additional knowledge gained by a child may result in better Thinking Skill
of IPC development.

6.12.0 EFFECT OF TREATMENT, TOLERANCE OF AMBIGUITY AND THEIR INTERACTION ON IPC THINKING SKILL OF STUDENTS BY CONSIDERING PRE- THINKING SKILL AS COVARIATE

The thirteenth objective of the study was to study the effect of treatment, Tolerance of Ambiguity and their interaction on development of Thinking Skill of Identifying Pros and Cons of students by considering Pre- Thinking Skill of IPC as covariate. The discussion regarding each one of them is as followed.

6.12.1 Effect of Treatment on IPC Thinking Skill of Students

The result in respect of effect of Treatment on IPC Thinking Skill by considering Pre-Thinking Skill as covariate and the reason are the same as given in Caption 6.2.0.

6.12.2 Effect of Tolerance of Ambiguity on IPC Thinking Skill of Students

Thinking Skill was found to be independent of level of Tolerance of Ambiguity of students when Pre-Thinking Skill of IPC was taken as covariate. It indicates that students belonging to low, moderate and high levels of Tolerance of Ambiguity were found to have similar Thinking Skill of IPC when Pre-Thinking Skill of IPC was taken as covariate. One of the reasons for this finding might be that the Pre Thinking Skill of IPC was taken as covariate. It might have helped in taking care of differences in Thinking Skill of IPC of students with low, moderate and high level of Tolerance of Ambiguity. Then although the students were divided into three groups as low, moderate and high
with respect to Tolerance of Ambiguity yet the differences might not have been so remarkable they that might have influenced the development of Thinking Skill of IPC. Since all the three groups of Tolerance of Ambiguity included the students who were taught using Instructional Material as well as Lecture Method, this might have been responsible for improving the development of Thinking Skill of IPC of students irrespective of their level of Tolerance of Ambiguity. In all the three groups, there were students from Experimental as well as Control groups. Due to this composition the mean Thinking Skills scores of IPC of groups with low, moderate and high level of Tolerance of Ambiguity might not have found to be significantly different.

Researchers have identified four approaches of decision making. These are Directive, Analytical, Conceptual and Behavioral. People using Directive styles have Low Tolerance of Ambiguity and seek rationality. They are efficient and logical but their efficiency concerns result in decision made with minimal information and with few alternatives assessed. The Analytic type has a much greater tolerance for ambiguity than do directive decision makers (Robbins, 1998). Further the level of Tolerance of Ambiguity has been found to be associated with the level of Creative or divergent thinking ability (Bhawalkar, 1992). Sharma (1979), commented that one who tolerates ambiguity, uncertainties and conflicts for long time enjoys an anchorage within some value system and that is the “need to be himself”. Thus measures of Tolerance of Ambiguity have been found to be of great significance in various walks of life as well as in the field of research. All these factors might have contributed in the scores of Thinking Skill of IPC.

6.12.3 Effect of Interaction between Treatment and Tolerance of Ambiguity on IPC Thinking Skill of Students

Thinking Skill was found to be independent of the interaction between Treatment and Tolerance of Ambiguity when Pre-Thinking Skill of IPC was taken as covariate. The finding indicates that, irrespective of level of Tolerance
of Ambiguity, the Thinking Skill of IPC of students can be improved equally well by using Instructional Material based on IPC when Pre Thinking Skill of IPC was taken as covariate. According to Maslow (1962) Tolerance of Ambiguity refers to tolerate inconsistencies and contradictions whereas Rokeach (1960) said that Tolerance of Ambiguity means to accept the unknown to be comfortable and work with ambiguous, approximate and uncertain stimuli. This means the Instructional Material can be equally useful to students of high, moderate and low level of Tolerance of Ambiguity.

It indicates that the treatment cares to all the students irrespective of their Tolerance of Ambiguity. The students of high Tolerance of Ambiguity could definitely benefit more from the treatment it helped them to listen and understand the view points of their classmates. Thus in the process of discussion and interaction during the steps of IPC, they might have build upon the concept and clarified any doubts, if any. Whereas with the students of low Tolerance of Ambiguity, the group activities must have been structured so well that in the course of participation, they would have gained from the output of others which resulted in enhanced Thinking Skill of IPC. Drawing boundaries could have been proved to be a valued activity to them because the content’s success was based on it and by the fact that one’s group mates will reward it.

6.13.0 EFFECT OF TREATMENT, STUDY HABITS AND THEIR INTERACTION ON IPC THINKING SKILL OF STUDENTS BY CONSIDERING PRE-THINKING SKILL AS COVARIATE

The fourteenth objective of the study was to study the effect of treatment, Study Habits and their interaction on development of Thinking Skill of Identifying Pros and Cons of students by considering Pre-Thinking Skill of IPC as covariate. The discussion regarding this is given as follows.
6.13.1 Effect of Treatment on IPC Thinking Skill of Students

The result in respect of effect of Treatment on IPC Thinking Skill by considering Pre-Thinking Skill as covariate and the reason are the same as given in Caption 6.2.0.

6.13.2 Effect of Study Habits on IPC Thinking Skill of Students

Thinking Skill was found to be independent of level of Study Habits of students when Pre-Thinking Skill of IPC was taken as covariate. It indicates that students belonging to different levels of Study Habits were found to have similar Thinking Skill of IPC when Pre Thinking Skill of IPC was taken as covariate. It reveals that Thinking Skill of IPC of students belonging to different levels of Study Habits did not differ significantly when Pre Thinking Skill of IPC was taken as covariate. One of the reasons might be that the Pre Thinking Skill of IPC was taken as covariate.

In the present study the investigator studied the Thinking Skill of IPC of students studying through Instructional Material with those studying through traditional method by taking Study Habits as a covariate. Study Habits as a research variable has been investigated in two ways. One group of studies treated this as dependent variable—measured it and also studied several other variables as its correlates. The second and the major group of researchers studied Study Habits as a correlate or predictor of certain other criterion variables. In fact Study Habit is a very important characteristic of all human beings who are ‘being educated’ and ‘are educated’. Study Habit as a habit, is generic than specific in terms of its importance. It has very long reaching effects deep into the life of individuals, and by cumulative and interactive effects in the society.

Study Habit has proved to be one of the important factors working behind the Achievement of the students. Both Study Habits and Achievement are highly correlated as a person with high level of Study Habits perceives himself to be knowledgeable, intellectually adequate, successful, satisfied, optimistic and high achievers. So it might be possible that students with high level of Study Habits will score high in the development of Thinking Skill of IPC. But from the present finding,
it can be seen that it is not necessary that students having high level of Study Habits will achieve high in Thinking Skill of IPC. This finding might be possible due to the Instructional Material based on Thinking Skill of IPC.

6.13.3 Effect of Interaction between Treatment and Study Habits on IPC Thinking Skill of Students

Thinking Skill was found to be independent of the interaction between Treatment and Study Habits when Pre-Thinking Skill of IPC was taken as covariate. The result of the present study showed that the developed Instructional Material was found to be effective in terms of Thinking Skill of IPC of students. By studying through Instructional Material the overall mean scores of Thinking Skill of IPC of students were found to be higher as compared to the students studying through the traditional method when the mean scores as Thinking Skill of IPC of students were adjusted with respect to Study Habits. The study habits have been considered to be constituted of nine different kinds of study behaviors. These are Comprehension, Concentration, Task Orientation, Sets, Interaction, Drilling, Supports, Recording and Language. While one can and usually does presume a delta point in life of an individual whereby the study habits gets fixed by certain age, possibly such patterns gets fixed only in overt behaviors like study sets, drilling etc. the covert behaviors, like concentration, comprehension, task orientation changes with each important changes in life stages.

The reasons for significant higher Achievement by studying through Instructional Material have been discussed in detail under caption 6.2.0. Now-a-days the general level of Study Habits of students has also improved due to media exposure and parents have become more conscious about the Study Habits of their children. There is different type of media exposure, web sites, books, exhibitions, projects, seminars, presentations etc; that promotes the development of Thinking Skill in general. This might be responsible for the present finding.
6.14.0 EFFECT OF TREATMENT, SELF CONFIDENCE AND THEIR INTERACTION ON THINKING SKILL OF STUDENTS BY CONSIDERING PRE-THINKING SKILL AS COVARIATE

The fifteenth objective of the study was to study the effect of treatment, Self confidence and their interaction on development of Thinking Skill of Identifying Pros and Cons of students by considering Pre- Thinking Skill of IPC as covariate. The discussion regarding each one of them is given under different captions.

6.14.1 Effect of Treatment on Thinking Skill of Students

The result in respect of effect of Treatment on IPC Thinking Skill by considering Pre-Thinking Skill as covariate and the reason are the same as given in Caption 6.2.0.

6.14.2 Effect of Self Confidence on IPC Thinking Skill of Students

Low and High Self Confident students were found to possess Thinking Skill to the same level when Pre-Thinking Skill of IPCwas taken as covariate. Self Confidence has proved to be one of the important factors working behind the way of thinking & development of Thinking Skill of IPC. The results showed that the developed Instructional Material was found to be effective in terms of the development of IPC Thinking Skill of the students by studying through Instructional Material. The overall mean Thinking Skill of IPC scores of students were found be higher as compared to students studying through traditional method when the mean IPC Thinking Skill scores of students were adjusted with respect to Self Confidence.

The obtained finding is contradictory to the finding by Asthana (2007), who compared the adjusted mean post Thinking Skill of Classification scores of the students of the experimental and control groups by considering Self Confidence as covariate and found that the interaction between treatment and Self Confidence
produced significant effect on post Thinking Skill of classification when pre-Thinking Skill of classification was taken as covariate.

Via present finding it can also be said that there was no significant effect of Self Confidence on the Thinking Skill of IPC of students due to instructional approach. It means that the students having high and low Self Confidence were equally benefited. This might be because the Instructional Material was developed keeping in view the psychological principles like the principle of individual differences. This might have helped the students of both the categories i.e. low Self Confidence and high Self Confidence students to gain knowledge from the new type of approach i.e. to provide teaching through Instructional Material according to their capacities. As per the definition of Basvan (1975) "Since Self Confidence is an individual's perceived ability to act effectively in a situation to overcome obstacles to get things all right", hence it might be possible that students having high and low Self Confidence might have acted effectively when taught through Instructional Material and Traditional method respectively. It may be possible that there was little variation in the group in respect of Self Confidence. Hence the students having high and low level of Self Confidence did not differ significantly.

6.14.3 Effect of Interaction between Treatment and Self Confidence on Thinking Skill of Students

There was no significant influence of resultant of interaction between Treatment and Self Confidence on Thinking Skill when Pre – Thinking Skill of IPC was taken as covariate. This outcome is might be due to the Instructional material used and the efforts of investigator.

While giving treatment through Instructional Material, the investigator mainly concentrated on the clarification of doubts emerging from theoretical concern as to how to identify, classify and the criteria to be adhered to firmly for practice exercises, which were informative in nature. This gave ample scope to the students to concentrate on specific area. The personality pattern is a unified multidimensional structure in which the concept of self is the core or center of the gravity (Breckenridge & Vincent, 1965) into this structure are integrated many patterns of response
tendencies, known as ‘traits’ which are closely related to and influenced by the concept of self. Self confidence is one such personality trait. The self is a composite of a person’s thoughts and feelings, striving and hopes, fears and fantasies, his view of what he is, what he might become, and his attitude pertaining to his worth.

Self confidence is a positive attitude of oneself towards own self concept. It is an attitude of perceived self. Self confidence refers to a person’s perceived ability to tackle situations successfully without leaning on others and to have a positive self-evaluation. The good behavior and corrective measures followed by the investigator, helped in the development of Self Confidence amongst students. Due to above mention reasons the treatment might have been found to be effective in the development of Thinking Skill of IPC of students. More details related to the development of Thinking Skill of IPC have been discussed in caption 6.2.0.

6.15. TO FIND OUT THE EFFECTIVENESS OF INSTRUCTIONAL MATERIAL IN TERMS OF REACTIONS OF STUDENTS OF THE EXPERIMENTAL GROUP.

The sixteenth objective of the study was to find out the effectiveness of Instructional Material in terms of reactions of students towards the Instructional Material. In the present study the developed Instructional Material was found to be effective in terms of overall reactions of students towards the Instructional Material. The reactions of the students were taken on various aspects of Instructional Material namely content, presentation of content, examples, exercises, language, conceptual clarification, questions, references, pictures and characteristics of Instructional Material.

The students reacted to each and every aspect of the Instructional Material favorably. Almost all the students were in the favor the new language used, varieties of pictures, appropriate headings helped in understanding the content easily. Another reason behind their favorable reactions was the interactive nature of the Instructional Material. Also the Instructional Material facilitated self learning and gave proper direction as to how to study in a better way; thus saved enough time and energy. Almost all the students were of the view that effective presentation style of the
Instructional Material, systematic and neat pictures related to the topic, to a great extent helped to facilitate the development of independent thinking style amongst the students.

The most important reason for favorable reactions of students towards Instructional Material might be that the content was logically sequenced and according to the mental level of the students, that fulfills the requirements of students of different intellectual levels. The Instructional Material served as a new stimulus and evoked favorable reactions from the students.

Thus due to new approach in teaching learning process and the capability for facilitation of self learning made the Instructional Material interesting and attractive for students. Hence it may be concluded that the Instructional Material was found to be effective in terms of reactions of students of the Experimental Group.