CHAPTER-V

DISCUSSION OF RESULTS

AND

FORMULATION OF CONCLUSIONS
CHAPTER V

DISCUSSION OF RESULTS AND FORMULATION OF CONCLUSIONS

In the present study an attempt has been made to analyze the main effects and interaction effects of confirmation of results and achievement motivation on post-test performance following a linear programme on Hindi vocabulary building. The results of the study based on experimental observations provide the basis of fairly valid formulation of conclusions in the area of teaching and learning. The findings of the study are directly related to the objectives of the study.

The present chapter has been divided into five parts. The first part of the chapter provides the discussion of the results; second part deals with the findings; third part gives an account of limitations of findings; fourth part presents implications of findings and last part contains the description of suggestions and further possibilities for experimentation in this area.

DISCUSSION OF RESULTS:

The results of the study are based on three ways analysis of variance technique which forms a mixed factorial design. The results have been discussed in three forms:

(A) main effects:
(B) Simple effects; and  
(C) Interaction effects.

(A) MAIN EFFECTS:

In this study three factors viz; confirmation of results, achievement motivation and sex have been considered. The discussion of main effects of these factors are as follows:

(i) Confirmation of results was taken up as treatment variable of experimentation. This treatment was given in two forms - immediate and delayed. Main effect of these two patterns was studied by employing the analysis variance technique. The 'F' value was found to be significant. The mean value of immediate confirmation of results was obtained to be higher than the delayed confirmation of results. On the basis of this result it may be concluded that immediate confirmation of results appears to be more effective than delayed confirmation of results with regard to the post-test performance. This finding is quite natural and consistent with the results of earlier reported research. Studies conducted by Pressey (1926, 1927, 1950), Little (1934), Angell (1949), Peterson (1960) and Anderson et al. (1971, 1972) revealed that prompt knowledge of results enhanced the student's capacity to learn. In the field of programmed instruction, a few studies have been designed to investigate the relative effectiveness of immediate and delayed confirmation of results. Meyer (196) found that in a linear programme, immediate confirmation of results
gave better results than delayed confirmation. In this study one group was provided with the immediate confirmation of results in terms of correct answers available in the text and another group was given confirmation of results with the delay of one day in terms of correction of the answers by the experimenter. This is the only study which supports the finding of the present study. One possible explanation for this finding may be that immediate confirmation of the results constitutes reinforcement and motivation. Thus the interest of the learner is sustained throughout the learning sequence and this situation accounts for the maximum learning. On the other hand, delayed confirmation of results diminishes the motivation of the student due to repetition of previous errors by the learner, situation accounts for his poorer performance.

The studies which show results contradictory to this finding of the present investigation are those of Smith and Moore (1961), Evans, Glaser & Homner (1962), Ottina (1964), Parkinson (1964) and Boersma (1965). These studies do not reveal significant difference between the effectiveness of immediate and delayed confirmation of results with regard to the performance on criterion-test. In these studies delivery of delayed confirmation of results was contingent upon a very short delay—running into seconds (3 to 10 seconds). It appears that due to this fact no significant difference was found between the effectiveness of immediate and delayed confirmation of results. However, the
results of these studies do not suggest that longer delays are not to be avoided for efficient learning.

(ii) The second factor of the study was achievement motivation. Three levels of achievement motivation were taken up and their significance of difference was analyzed by applying 'F' test. The 'F' value was found to be significant. The 't' test was also applied for three combinations of achievement motivation for locating the specific results. The 't' values were found to be significant for these three combinations. On the basis of these results, it may be concluded that high achievement motivation group seems to have higher performance than average and low achievement motivation groups. It may also be concluded that average achievement motivation group seems to have higher performance than low achievement motivation group.

These findings may be supported by the results of a number of earlier research conducted in class room situation. Studies, for example, by Morgan (1952), McClelland et al.(1953), Ricciute et al. (1955), Weiss et al. (1959), Unlinger and Stephens (1960), Dember et al. (1962), Stanford et al. (1963) and Mehta (1969) have reported moderate positive correlations between achievement motivation and academic performance. There are only few studies related to achievement motivation and programmed instructional performance. No parallel study is available to the present one, yet three of them partially support the findings of the present
study. Bartmann (1965) concluded that success—motivated subjects showed greater improvement in the performance, after going through programmed instructional material (the correlation being independent of intelligence). Another study conducted by Kight and Sassenrath (1966) revealed that the students with high-achievement-motive performed better than low-achievement-motivated students. Patel (1977) also observed that the auto— instructional programme did not work well with the pupils having low achievement motivation, whereas, in case of high achievement motivated students the material was found to be working well.

Apart from above cited studies, the findings of present study has sufficient rationale for the significant difference in the performance of varying levels of achievement motivated subjects. According to French (1955), the results generally have shown that subjects with high achievement motivation tend to exhibit higher performance scores than do low achievement motivated subjects, especially on the simpler tasks. Since the programmed instruction, particularly in a linear programme, the difficulty of all the items (tasks) is kept intentionally low. High achievement motivated students thus have an opportunity to work faster and show over all proficiency than do subjects with average and low achievement motivation. Likewise, average-achievement-motivated students have an opportunity to work faster and show better performance than do learners with low achievement motivation. This discussion
suggests that achievement motivation plays a crucial role in student's performance inspite of the inherited motivational component of the P.L.M. Thus findings of the study with regard to the effect of achievement motivation on learners performance, seem to be quite natural.

However, the studies conducted by Doty and Doty (1964), Shaver and White (1966), Shareale and Sassenrath (1970) showed no significant relationship between achievement motivation and programmed instructional performance.

(iii) The third factor of the study was the sex. The 'F' value for the main effect of the sex was not found significant. Therefore, it may be inferred from this result that boys and girls learn equally through different treatments—immediate and delayed confirmation of results. This finding is in accord with some of the reported research. Lathe (1966) concluded from his study that boys and girls were equally benefitted by P.L.M. Verma (1977) observed that there was no difference between boys and girls performance on programmed instruction. Bhartiya (1979) also found that mathematical performance of boys and girls was not significantly different.

One of the possible explanations may be that in present study, a linear programme was used which is characterized by small steps and self-pacing. Therefore, both boys and girls had equal opportunity for efficient learning through different treatments—
Immediate and delayed confirmation of results. Thus obtained finding with regard to the main effect of sex seems to be natural.

(B) SIMPLE EFFECTS OF ACHIEVEMENT MOTIVATION:

The simple effect difference was also analyzed for three levels of achievement motivation.

(i) The 't' value for the simple effect for immediate and delayed confirmation of results at high achievement motivation level was not found significant. Therefore, it may be concluded that immediate and delayed confirmation of results are equally effective at high achievement motivation. This finding seems to be quite natural. Under the delayed confirmation of results, students with high achievement motive read content of the frame more attentively because of their strong desire to achieve excellence in the performance. Therefore, they show equally good performance under delayed confirmation of results also. No parallel study is available. Hence to have an empirical support for the obtained finding, more studies are needed in this direction.

(ii) The 't' value for the simple effect-difference between immediate and delayed confirmation of results at average achievement motivation level was found highly significant. It may be inferred that immediate confirmation of results is more effective than delayed confirmation of results at average achievement motivation level. No study is available in the field of programmed instruction, which could be cited in support of this conclusion. But this
finding has sufficient rationales. Delayed confirmation of
results increases the chances of committing more errors in the
responses; consequently diminishes the motivation level of the
student. While immediate confirmation of results has the merit
of bringing the erroneous responses to the notice of the learners
immediately and furthermore causes him to emit the correct
responses eventually by enhancing the level of his motivation.
Thus, average achievement motivated students are able to derive
greater benefit from the immediate confirmation of results —
a standard characteristic of programmed instruction.

(iii) The 't' value for the simple effect difference between
immediate and delayed confirmation of results at low achievement
motivation level was found to be highly significant. Therefore,
it may be concluded that immediate confirmation of results is
more effective than delayed confirmation of results for low
achievement motivation group. This finding also seems to be quite
natural. The same rationales is applicable here as in the case of
average achievement-motivated students.

(C) INTERACTION EFFECTS:

In this study interaction effects of two factors and three
factors were analyzed.

(i) The 'F' value for the interaction effect of confirmation
of results and achievement motivation was found significant even
at .01 level of confidence. This 'F' value does not specify the
results, therefore, 't' test was applied for drawing the specific conclusions. The 't' value for the interaction of high and average achievement motivation level with confirmation of results was found significant. Therefore, it may be concluded that average achievement motivation group seems to have a significant interaction with immediate confirmation of results with regard to the learning outcomes. The 't' value for the interaction of high and low achievement motivation with confirmation of results was also found significant. It may be inferred from this result that low achievement motivation group learns better through immediate confirmation of results. The 't' value for the interaction of average and low achievement motivation with confirmation of results was found significant. Therefore, it may be concluded that average achievement motivation group interacts significantly higher with immediate confirmation of results than low achievement motivation group with regard to the learning achievement.

(ii) The 'F' value for the interaction of confirmation of results and sex variables was not found significant at any level of confidence. On this basis of this result it may be inferred that confirmation of results seems to have no interaction with regard to the learning performance.

(iii) The 'F' value for the interaction effect of achievement motivation and sex was not found significant at any level of confidence. Hence, it may be concluded that achievement motivation seems to have no interaction with sex factor with regard to the learning performance. This finding also seems
natural due to the ample opportunity for practice of a concept in a linear programme on Hindi vocabulary building.

(iv) The 'F' value for the interaction effect of three variables—confirmation of results, achievement motivation and sex—was obtained not to be significant at any level of confidence. Thus it may be inferred that there is no interaction among confirmation of results, achievement motivation and sex variables with regard to the learning performance. This result may be due to the reason that sex factor influenced the interaction effect of both confirmation of results and achievement motivation. Hence this obtained finding seems to be natural.

Regarding the interaction effect of confirmation of results, achievement motivation and sex variables, other studies are not available which could be cited in support of the obtained finding. Therefore, obtained findings may not be discussed in broader perspective and nothing may at be stated firmly. More studies are required in this direction to have some empirical support for obtained findings.

(v) The 'F' value for the interaction effect of confirmation of results and sex was not found to be significant at any level of confidence. On the basis of this result it may be inferred that confirmation of results seems to have no interaction with sex with regard to the learning outcomes. It may be due to the reason
that linear programme on Hindi vocabulary building provided sufficient practice for the learning of a concept. Thus, this finding seems to be natural.

FINDINGS:

On the basis of foregoing discussion of results, the following conclusions seem to be tenable:

_____ Immediate confirmation of results appears to be more effective than delayed confirmation of results with regard to the students' performance.

_____ The performance of high achievement motivation group seems to be higher than that of average and low achievement motivation group.

_____ The average achievement motivation subjects appear to have greater achievement than low achievement motivation subjects.

_____ The boys and girls seem to be equally benefitted by the linear programme with regard to the learning performance.

_____ Immediate & delayed confirmation of results appear to be equally effective for the group of high achievement motivation students.

_____ It seems that immediate confirmation of results has significant interaction with average and low achievement motivation students with regard to the post-test performance.
It appears that the treatment of confirmation of results has no interaction with sex with reference to the learning outcomes.

It seems that achievement motivation factor has not also significant interaction with sex with regard to the learning performance.

It appears that there is no significant interaction among three variables viz. confirmation of results, achievement motivation and sex jointly with regard to the post-test performance.

LIMITATIONS OF THE FINDINGS:

The obtained findings have their own limitations as already mentioned in the first chapter of the report. Besides, the sample of the present study was taken from Meerut City only. Therefore, these generalizations are appropriate only to the population which seems reasonably similar to that employed in this study.

The experimental design and the statistical technique, used in the present study for analyzing the data have their own limitations. Hence, the interpretations and inferences of the study suffer from these limitations.

Moreover, the obtained findings are based on the performance in a linear programme on Hindi vocabulary building - an aspect of
Hindi language. The learning performance may differ from subject to subject and from one topic to another within the same subject, therefore, the conclusions of this study may be applicable to learning experience of similar nature through the same programming model.

IMPLICATIONS OF THE FINDINGS:

The findings of the present investigation bear several implications. The first and foremost is that these clarify the issues pertaining to the practical necessity of providing immediate reinforcement in terms of immediate confirmation of results with reference to linear programmed instructional material.

The generalizations of the study reveal the differences in the amount of performance on the criterion test (post-test) for the learners with high, average and low achievement-motive as a result of different patterns of confirmation of results, i.e., immediate and delayed. Thus, these generalizations provide an adequate basis for the development of programmed instructional material for the students of varying levels of achievement motivation.

Further, the inferences of the present research may be helpful to the administrators of the schools as well as teachers in selecting programmed instructional material with appropriate condition of confirmation of results for the learners of different levels of achievement motivation.
The teachers may also derive an advantage in imparting instruction in an effective manner in the class-room by arranging appropriate contingency of reinforcement for different groups of students with high, average and low achievement-motive.

The obtained findings of the study also provide the basis for the teachers, particularly the school teachers for increasing the level of achievement motivation of the average and low achievement motivated subjects.

Apart from all, strategies adopted in the present investigation may be the basis of further enquiry into possible conditions for utilization of the programmed instructional material and may contribute, this way, to evolving a form of instructional technology suitable to the conditions prevailing at present in Indian educational institutions.

SUGGESTIONS AND FURTHER POSSIBILITIES:

The conclusions and generalizations formulated in this chapter may be evaluated within the frame-work of the present study. Therefore, some suggestions with regard to the further possibilities are being offered with a view to inspire the researchers who are interested in this sphere:

- A parallel study may be designed for cross validating the findings by taking the sample from other places.

- A similar investigation may be taken up for teaching of other difficult topics of Hindi language and also in the regional languages.
A parallel experimental study may be designed for teaching of subjects other than languages.

The interaction effect of achievement motivation and confirmation of results may be studied on the performance in different models of programmed instruction.

The effect of confirmation of results, achievement motivation and taxonomic categories may be studied.

The interaction effect of programme variables and organism-variables which do not find place in the present study, may be investigated.

It is the hope of the investigator that studies designed on the above mentioned lines may contribute a lot to both theoretical and practical domains of teaching-learning process.