CHAPTER V

THE RESUME

5.10 The Summary

5.11 The Problem

5.12 Objectives

5.13 Hypotheses Formulation

5.131 Differential studies

5.132 Interactional studies

5.133 Correlational studies

5.14 Delimitations of the study

5.15 Sample

5.16 Instruments used

5.17 Data analysis and statistical treatment

5.20 Conclusions

5.30 Suggestions

5.40 Follow-up studies.
CHAPTER V

THE RESULTS

The present Chapter deals with the Summary, Conclusions, Suggestions and Follow-up studies. The details on each one of these aspects of the study have been presented as under:

5.10 THE SUMMARY:

5.11 The Problem:

Emergence of the concept of 'Thinking Child' in place of 'Learning one' has enhanced the studies on higher mental processes. 'Learning to learn' and 'Learning to think' have been considered the ultimate aim of educational system. Studies conducted by Bruner, Goodnow and Austin (1956), Bruner (1957), Bourne (1963), Byers (1963), Elkind (1963), Kendler (1961, 1962), Smoke (1932), Vinacke (1951, 1952, 1959, 1960, 1964) revealed the significance of conceptual learning. The studies conducted over Indian Children by Rao (1970) on 'Strategy in Concept Learning', by Ramji Shrivastava (1980) on 'Mediational Processes in Concept Identification' and Vaidya (1980) on 'Concept Formation in Science' highlighted the significance and relevance of 'conceptual learning' in the national system of education. However, the research design
adopted by them did not include the extreme samples on certain significant psychological variables, like intelligence, personality traits, etc. Studies conducted by Getzel and Jacksons (1962) on 'Intelligence and Creative 'thinking' revealed that extreme group samples constitute very significant, meaningful and dependable research. The existing literature on 'conceptual learning' had a gap so far as the differential nature, kind and level of concept formation abilities of the extreme group samples are concerned. The studies on concept formation have been found very scanty, insignificant, stereotype and insufficient. Significant psychological variables like intelligence and achievement motivation which are considered primary psychological constructs, governing human behaviour have not yet been studied in relation to conceptual learning. In view of these gaps existing in the current literature on 'Conceptual Learning', the present study has been designed with a view to advance the limits and status of the literature on 'concept formation' and thereby to bridge the existing gap in the current literature.

The present study could be pin-pointedly stated as under:

"Concept Formation as a Function of Verbal Intelligence and Achievement Motivation".
5.12 **Objectives:**

1. To study the processes (i.e. nature, form and kind) and product of concept formation under different levels of intellectual development and achievement motivation employing extreme criterion group samples.

2. To study the relative interaction of verbal intelligence and achievement motivation on concept formation as a process and product.

3. To study the relative relationship between concept formation and verbal intelligence, and concept formation and achievement motivation.

4. To study the inter- and intra-group sex differences of the (Hi-Hn Ach), (Li-Ln Ach) (Hn-Ln Ach) and (Ln-Hn Ach) in concept formation abilities and concept strategies adoption.

5.13 **Hypotheses Formulation:**

Hypotheses formulated for testing the assumptions on concept formation of various extreme criterion interacting groups have been classified under three heads of studies as under:

5.131 **Differential Studies:**

DH₁: "Verbal intelligence would significantly affect the nature, kind and form of concept formation."
Stated otherwise,
"The nature, form and kind of concept formation of the (Hi) would be significantly different from the (Li) group".

DH₂: "Concept formation would be significantly affected by achievement motivation".

In other words,
"There exists a significant difference between the concept formation abilities of the (Hi Ach) and (Ln Ach) groups".

DH₃: "The pupils having high mental ability and high achievement motivation (Hi-Hn Ach) would have significantly higher level of concept formation than those with low general mental ability and low achievement motivation (Li-Ln Ach)"

DH₄: "There exists no significant difference between the nature, kind, form and level of concept formation of the pupils of (Hi-Ln Ach) and (Li-Hn Ach) groups".

DH₅: "There exists a significant sex difference in the concept formation abilities of the boys and girls, when they were classified in terms of extreme groups in accordance with their verbal intelligence and achievement motivation".

Stated otherwise,
"There exists a significant inter- as well as intra- group sex differences between the boys and
girls of the (Hi-Hn Ach), (Li-Ln Ach), (Hi-Ln Ach) and (Li-Hn Ach) groups".

5.132 Interactional studies:

IH₆: "Relatively, verbal intelligence would have greater effect upon concept formation than achievement motivation or sex".

5.133 Correlational studies:

CH₇: "There exists positive, linear significant relationship between dependent (e.g. concept formation) and independent (e.g. Verbal intelligence [(CH₇-a) and achievement motivation (CH₇-b)] variables".

5.14 Delimitations of the study:

1. It aims at studying 'concept formation' as dependent variable and 'verbal intelligence' and 'achievement motivation' as independent variables. No other variable has been included in this study.

2. In the present study, concept formation ability has been evaluated on the tests materials developed by Bruner, Goodnow and Austin (1956). Consequently, the method, procedure and technique followed by them have been employed and observed.

3. Data has been collected from the Hindi medium higher secondary schools at grade X of Bilaspur
town only. Pupils of both the sexes have been employed. The study does not take into consideration the geographical or socio-cultural variations.

4. It is primarily a differential study of the four extreme criterion groups classified in accordance with their extreme levels of verbal intelligence and achievement motivation.

5. It aims at studying types of strategies employed by extreme criterion groups only in terms of 'wholist' or 'partlist' strategy. No other aspect of strategy has been studied here.

5.15 Sample:

The Universe of pupil population of the 10 randomly selected Hindi medium higher secondary schools of Jillapur town at grade X consisted of 1644 pupils constituted the base of the study. Out of these 1644 pupils, about 50% of the pupils (i.e. 820 Ss) were randomly selected for screening purposes. Tests of verbal intelligence and achievement motivation as criterion tests were administered over these 820 pupils. After screening, 293 pupils were classified as 'highly intelligent' (Hi) while 218 as 'low intelligent' (Ll) on the criteria when all pupils who attained above P75, were terms as 'Highly Intelligent' (Hi) and all those who scored below P25, were called 'Low
intelligent' (Li). Similarly, on the criterion of achievement motivation, 248 pupils were classified under 'Highly Need Motivated' (HN Ach) group whereas 274 pupils were categorized as 'Low Need Motivated' (LN Ach) group when the same criteria of retention and classification of pupils into extreme groups were employed.

Employing the same criteria of classification, four extreme criterion interacting groups were formed. The size of these groups have been given as under:

(a) Hi-Hn Ach i 105
(b) Hi-Ln Ach i 103
(c) Li-Hn Ach i 98
(d) Li-Ln Ach i 109

Total: 415

The study proper has, therefore, been conducted on a total sample of 415 pupils categorized into four extreme criterion interacting groups, as mentioned below:

5.16 Instruments:

I. Dependent Variables:

Concept Formation (measured by):

(I) Bruner, Goodnow and Austin's (1956) Test of Concept Formation, consisting of :
(a) Selection problems.
(b) Inference problems.

(ii) PEC (Post-Experimental Questionnaire).

II. Independent Variables:

(a) Verbal Intelligence (measured by):
PSM-Verbal Test of Intelligence.

(b) Achievement Motivation (measured by):
Achievement Motive Inventory (by Prayag Mehta).

5.17 Data Analysis and Statistical Treatment:

Data has been analyzed and processed in accordance with the requirements of the hypotheses sequentially and systematically. Screening process employed computation of percentile scores. Differential studies have been treated by the application of Means, SDS and t test (DH₁, DH₂, DH₃, DH₄ and DH₅) whereas Pearson Product Moment Coefficient of correlation has been computed for establishing relationship between dependent and independent variables (CH₇). ANOVA has been employed for studying the interactional effects of the independent variables on the dependent variable (IH₆).
5.20 **CONCLUSIONS**

1. Intelligence has been found to be a good predictor of the nature, form and kind of concept formation ability (DH₁ - Retained).

2. Highly intelligent pupils (Hi) have shown significantly superior ability in concept formation to those of low intelligent pupils (based on - DH₁).

3. Achievement motivation has also been found to have a significant effect upon the concept formation ability (DH₂ - Retained).

4. Highly motivated pupils (Hn Ach) have shown significantly superior ability in concept formation to those of low motivated pupils (based on - DH₂).

5(a) The (Hi-Hn Ach) group is significantly better in concept formation ability than the (Li-Ln Ach) group (DH₃ - Retained).

5(b) The pupils from (Hi-Hn Ach) group employed "wholist" strategy in their concept formation process whereas those from (Li-Ln Ach) group opted for "Partists" strategy. Further, both boys and girls of (Hi-Hn Ach) group employed 'wholist' strategy whereas both, boys and girls of the (Li-Ln Ach) group adopted (Partist'
strategy. This result indicates a differential adoption of strategies by pupils of (Hi-Hn Ach) and (Li-Ln Ach) group indicating thereby the effect of level of intelligence and achievement motivation on concept formation process. Further, there existed an inter-group sex difference in the adoption of these types of strategy in concept formation processes; though there existed no intra-group sex difference (DH$_3$ - Retained).

6(a) The (Hi-Ln Ach) group has been found significantly superior in concept formation ability to the (Li-Hn Ach) group (LH$_4$ - Partially rejected).

6(b) Pupils from both the groups; namely (Hi-Ln Ach) and (Li-Hn Ach), regardless of their intra- as inter-group sex differences, employed "Partist", strategy in their concept formation processes which is indicative of the fact that both, verbal intelligence and achievement motivation as individual variables affecting the preferences for adoption of strategy in concept formation, have more or less identical impact upon dependent variable (DH$_4$); however, when both, i.e. verbal intelligence and achievement motivation operate jointly, the relative effect on the preference of adoption of strategy in
in concept formation differed significantly with a difference in their level of verbal intelligence and achievement motivation (DH_3). For instance, the (Hi–Hn Ach) group employed "holist" strategy whereas the (Li–Ln Ach) group had shown a preference for the adoption of 'partist' strategy (Based on DH_3) whereas, both the (Hi–Ln Ach) and (Li–Hn Ach) employed 'partist' strategy without showing any significant difference (DH_4). These results led to the retention of (DH_3) and partial retention of (DH_4).

7. Intelligence is relatively a better predictor of concept formation ability than achievement motivation (Based on DH_1, DH_2, DH_3 and DH_4).

8. There existed no significant sex difference between the boys and girls of the four extreme groups: namely, (Hi–Hn Ach), (Li–Ln Ach), (Hi–Ln Ach) and (Li–Hn Ach), in their ability in concept formation; though the girls of all the four extreme groups have consistently scored higher than the boys on all the four criterion scores on the tests of selection problems and inference problems as indicative of their inferior ability in concept formation (DH_5- Rejected).
9. Relatively, verbal intelligence has been found to have the greatest significant interactional effect on concept formation. Achievement motivation, has been rather, placed at the second position from the points of view of its effect on concept formation (IH₆-Retained). And these results have been found consistently on various criterion scores of concept formation test. The results obtained on the trial scores, as the first criterion score, of the Selection problem Test have been consistently confirmed in the subsequent criterion scores; namely, the time(I) score on Selection Problem Test, the time(II) score on Inference Problem Test and the Total strategy scores on Global Concept formation Test (Hypothesis IH₆ has been completely retained).

10. There existed positive, linear significant relationship between the scores on the tests of: (I) Concept Formation and Verbal Intelligence, and (II) Concept Formation and Achievement Motivation. The latter independent variables; namely, verbal intelligence and achievement motivation have been found to be good predictors of the former dependent variable, i.e. concept formation. (CH₇ - Retained); however relatively the former is superior
predictor to the latter. Verbal intelligence, thus, possesses greater common factor with concept formation than achievement motivation.

5.30 SUGGESTIONS:

Studies on higher mental processes have been gradually emerging as significant and meaningful researches. "Cognitive processes, such as concept formation, risk-taking and problem-solving are again a respectable and popular topic of study" (Hergenhahn, 1976, 374). Since these areas are of vital interest to psychologists, the investigators must be encouraged to take up more and more studies on such topics.

In view of the emerging significance of the 'thinking child', concept formation as the level-II learning should be considered in the research priorities by funding authorities so that meaningful and dependable researches could be conducted. Research conducted on conceptual learning should be objectively evaluated by a competent body of experts and should be suitably rewarded so that there could be more and more inflow of researches on various aspects of concept learning.

5.40 FOLLOW-UP STUDIES:

Numerous studies could be designed with concept formation as dependent or independent varia-
bles; however, the following should get priority over the others:

1. Concept formation as a function of Creative Thinking and Abstract Intelligence.

2. Concept formation as a function of some significant Personality Traits.

3. Concept formation as a function of motives.

4. A study of Focus of Control and Concept Formation Abilities.

5. Concept formation Abilities as related to cognitive styles.

6. A Factor study of Concept formation abilities and Verbal Intelligence.

7. A relationship between Concept formation Abilities and Creativity.

