CHAPTER VI

FINDINGS, CONCLUSIONS AND SUGGESTIONS

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6.1 STUDY IN RETROSPECT

The present study has been designed to determine the effectiveness of
certain behavior modification models on achievement in commerce of students at
higher secondary level. This chapter deals with the major findings that emerged from
the study and its implications. An overview of the procedure followed in the study, a
summary of important findings, recommendations for further improvement and some
suggestions for further research are presented herewith.

6.1.1 Restatement of the Problem

The present study is undertaken with the objective of testing the
effectiveness of selected behavior modification models on achievement in
Commerce of Higher Secondary students. Therefore the topic of the study is
entitled as “EFFECTIVENESS OF CERTAIN BEHAVIOUR MODIFICATION
MODELS ON ACHIEVEMENT IN COMMERCE AMONG STUDENTS AT HIGHER
SECONDARY LEVEL”.

6.1.2 Objectives of the Study

The major objectives of the study are:-

1. To find out the effectiveness of Behaviour Modification Models of Teaching
   and Conventional Activity Oriented Method on Achievement in Commerce of
   students at Higher Secondary Level.
2. To compare the effectiveness of Behaviour Modification Models of Teaching with the Conventional Activity Oriented Method on Achievement in Commerce of students at Higher Secondary Level.

3. To find out the effectiveness of Behaviour Modification Models of Teaching and Conventional Activity Oriented Method on Achievement in Commerce of students at Higher Secondary Level with respect to the category of objectives - Knowledge, Understanding, Application, Analysis, Synthesis and Evaluation.

4. To compare the effectiveness of Behaviour Modification Models of Teaching with Conventional Activity Oriented Method on Achievement in Commerce of students at Higher Secondary Level with respect to the category of objectives - Knowledge, Understanding, Application, Analysis, Synthesis and Evaluation.

5. To find out the effectiveness of Behaviour Modification Models of Teaching and Conventional Activity Oriented Method on Interest in Commerce of students at Higher Secondary Level.

6. To compare the effectiveness of Behaviour Modification Models of Teaching with Conventional Activity Oriented Method on Interest in Commerce of students at Higher Secondary Level.

7. To find out the effectiveness of Behaviour Modification Models of Teaching and Conventional Activity Oriented Method on Attitude towards Commerce of students at Higher Secondary Level.
8. To compare the effectiveness of Behaviour Modification Models of Teaching with Conventional Activity Oriented Method on Attitude towards Commerce of students at Higher Secondary Level.

6.1.3 Hypotheses of the Study

Keeping in view of the objectives of the study, the following hypotheses were formulated.

1. The Achievement in Commerce of students at Higher Secondary Level taught using Behaviour Modification Models of Teaching is significantly higher than that of students taught using the Conventional Activity Oriented Method.

2. The Achievement in Commerce of students at Higher Secondary Level taught using Behaviour Modification Models of Teaching is significantly higher than that of students taught using the Conventional Activity Oriented Method with respect to categories of objectives-Knowledge, Understanding, Application, Analysis, Synthesis and Evaluation.

3. The Interest in Commerce of students at Higher Secondary Level taught using Behaviour Modification Models of Teaching is significantly higher than that of students taught using the Conventional Activity Oriented Method.

4. The Attitude towards Commerce of students at Higher Secondary Level taught using Behaviour Modification Models of Teaching is significantly
higher than that of students taught using the Conventional Activity Oriented Method.

6.1.4 Methodology in Brief

Experimental method was used to conduct the present study. The design selected was pretest-posttest non-equivalent group design (Best & Khan; 2007). The samples for the study are selected from two schools namely Government Higher Secondary School, Muppathadam, Aluva and Cardinal Higher Secondary School, Thrikkakara, Ernakulam. The study was conducted on a final sample of 200 students (50 students in each group) of standard XII. The tools used were lesson transcripts based on Contingency Management Model of Teaching, Direct Instruction Model of teaching and combination of Contingency Management Model and Direct Instruction Model and Conventional Activity Oriented Method of Teaching for instruction and an achievement test. To compare the level of general intelligence of the whole sample, Raven's Standard Progressive Matrices was used. Commerce Interest Inventory and Commerce Attitude Scale prepared and standardized by the investigator were used to measure students' Interest in Commerce and Attitude towards Commerce. The previous achievement in commerce and General Intelligence of the whole students were compared before grouping the students and then the students were classified into four groups in consultation with the teachers of the concerned schools. Three groups were selected as experimental group and the one group as control group. Before starting the experimental treatment, the achievement test in Commerce, Commerce
Interest Inventory and Commerce Attitude Scale were administered as pre-test. Then the Experimental Group I (EI) was taught with the lesson transcripts prepared based on Contingency Management Model of Teaching, Experimental Group II (EII) was taught with lesson transcripts based on Direct Instruction Model of Teaching, Experimental group III (EIII) was taught using lesson transcripts based on combination of Contingency Management Model & Direct Instruction Model and the Control Group (C) was taught through Conventional Activity Oriented Method of teaching. When the experiment was over, the same achievement test, Commerce Interest Inventory and Commerce Attitude Scale were administered to the experimental groups and control group as post-test. The pre-test and post-test scores were subjected to analysis by applying appropriate statistical techniques.

6.2 MAJOR FINDINGS OF THE STUDY

The major findings that have been emerged from the analysis are presented below,

COMPARISON OF ACHIEVEMENT IN COMMERCE (TOTAL SCORES)

6.2.1 The comparison of the post-test scores of students in the experimental groups and control group with respect to achievement in commerce revealed that the experimental groups and control group differs significantly. The critical ratios are 3.92 for EI and EII, 0.10 for EII and EIII, 3.94 for EI and EIII, 13.37 for EI and C, 21.34 for EII and C and 20.82 for EIII and C respectively. It is significant at the 0.01 level except for EII and EIII. The ‘t’ value and the mean difference reveal that the Behavior Modification Models are more
effective than the Conventional Activity Oriented Method with respect to Achievement in Commerce.

6.2.2 The analysis of variance of the pre-test and post-test scores showed that there was no significant difference between the means of pre-test scores of the experimental groups and control group, \((F_x = 1.25)\). But there was significant difference between the means of the post-test scores of the groups \((F_y = 158.27)\), which is significant at 0.01 level. It indicates that the groups under study differ significantly in their post-test achievement.

6.2.3 The analysis of covariance of the pre-test and post-test scores showed that the difference between the means of the post-test scores of the groups under study are statistically significant \((F_{yx} = 154.87, P<0.01)\).

6.2.4 When the adjusted means of the post-test scores were compared, the difference between them was found to be statistically significant at 0.01 level. The ‘t’ values obtained were 14.33 for EI & C, 18.60 for EII & C, 18.74 for EIII & C, 4.27 for EI & EII, 4.41 for EI & EIII and 0.15 for EII & EIII. The obtained values are significant at 0.01 level except for the groups EII & EIII. Since the adjusted means of all the experimental groups are significantly higher than that of the control group, the students in the experimental groups are found superior on Achievement in Commerce than the students in the Control group. Further the analysis shows that, among the experimental groups, the adjusted mean for groups EII and EIII is significantly higher than that of the group EI. Therefore, it is concluded that out of the three experimental
strategies under study, the Direct Instruction Model (Group EII) and the combination of Contingency Management Model & Direct Instruction Model (Group EIII) stand on much better position than the Contingency Management Model (Group EI).

6.2.5 The results obtained from the Comparison of the gain scores on Achievement in Commerce (Total scores) show that the experimental groups and control group differ significantly with respect to their gain scores on Achievement in Commerce. The critical ratio is 3.39 for EI and EII, 0.62 for EII and EIII, 3.75 for EI and EIII, 11.14 for EI and C, 15.65 for EII and C and 14.95 for EIII and C respectively. It is significant at the 0.01 levels except for the experimental group EII & EIII. The mean gain scores of the experimental groups are significantly higher than that of the control group on Achievement in Commerce. Thus it is concluded that the Behavior Modification Models are superior to the Conventional Activity Oriented Method of Teaching with respect to total Achievement in Commerce.

COMPARISON OF ACHIEVEMENT IN COMMERCE UNDER THE CATEGORY OF OBJECTIVE-KNOWLEDGE

6.2.6 When compared the post-test scores of the experimental and control groups with respect to commerce achievement, it was revealed that the experimental groups and control groups are differs significantly (The critical ratio is 3.22 for EI and EII, 0.30 for EII and EIII, 3.18 for EI and EIII, 5.37 for EI and C, 10.05 for EII and C and 10.54 for EIII and C respectively. It is significant at the 0.01
level except for EII and EIII). The ‘t’ value and the mean difference reveal that the Behavior Modification Models are more effective than the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective-Knowledge.

6.2.7 The analysis of variance of the pre-test and post-test scores showed that there was no significant difference between the means of pre-test scores of the experimental groups and control group, (Fx = 2.60) which is not significant even at 0.05 level. But there was significant difference between the means of the post-test scores of the groups (Fy = 41.57), which is significant at 0.01 level. It indicates that the groups under study differ significantly in their post-test achievement under the category of objective-Knowledge.

6.2.8 The analysis of covariance of the pre-test and post-test scores showed that the difference between the means of the post-test scores of the groups under study are statistically significant (Fyx = 39.02, P<0.01).

6.2.9 Adjusted means for post-test scores were tested for significance for df 3/195. The ‘t’ values obtained was 6.21 for EI & C, 9.51 for EII & C, 9.46 for EIII & C, 3.30 for EI & EII, 3.25 for EI & EIII and 0.05 for EII & EIII. The obtained values are significant at 0.01 level except for groups EII & EIII. Since the adjusted means of all the experimental groups are significantly higher than that the control group, the students in the experimental groups are found superior on Achievement in Commerce than the students in the
Control group under the category of objective Knowledge. Further it is concluded that, among the experimental groups, the adjusted mean for groups EII and EIII is significantly higher than that of the group EI. Therefore, we can conclude that out of the three experimental strategies under study, the Direct Instruction Model (Group EII) and the combination of Contingency Management Model & Direct Instruction Model (Group EIII) stand on much better position than the Contingency Management Model (Group EI) on Achievement in Commerce.

6.2.10 The results obtained from the Comparison of the gain scores on Achievement in Commerce under the category of objective-Knowledge shows that the experimental groups and control group differ significantly with respect to their gain scores on Achievement in Commerce under the category of objective-Knowledge. The critical ratio is 2.61 for EI and EII, 0.99 for EII and EIII, 3.44 for EI and EIII, 3.45 for EI and C, 6.55 for EII and C and 7.30 for EIII and C respectively. It is significant at the 0.01 levels except for the experimental groups EII & EIII. Hence the Behavior Modification Models are superior to the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective-Knowledge.
6.2.11 When compared the post test scores of the experimental and control groups with respect to Achievement in Commerce, it was revealed that the experimental groups and control group are differ significantly. The critical ratios are 3.76 for EI and EII, 1.80 for EII and EIII, 2.44 for EI and EIII, 8.18 for EI and C, 17.05 for EII and C and 14.70 for EIII and C respectively. It is significant at the 0.01 level except for EII and EIII. The ‘t’ value and the mean difference reveal that the Behavior Modification Models are more effective than the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective-Understanding.

6.2.12 The analysis of variance of the pre-test and post-test scores shows that there was no significant difference between the means of pre-test scores of the experimental groups and control group, (Fx = 1.42) which is not significant even at 0.05 level. But there was significant difference between the means of the post-test scores of the groups (Fy = 76.81), which is significant at 0.01 level. It indicates that the groups under study differ significantly in their post-test achievement under the category of objective-Understanding.

6.2.13 The analysis of covariance showed that the difference between the means of the post-test scores of the groups under study are statistically significant (Fyx = 75.92, P<0.01).
6.2.14 When the adjusted means were compared, the difference between them was found to be statistically significant at 0.01 level. The 't' values obtained was 9.36 for EI & C, 13.74 for EII & C, 12.27 for EIII & C, 4.37 for EI & EII, 2.91 for EI & EIII and 1.46 for EII & EIII. The obtained values are significant at 0.01 level except for groups EII & EIII. Since the adjusted means of all the experimental groups are significantly higher than that the control group, the students in the experimental groups are found superior on achievement in Commerce than the students in the Control group under the category of objective Understanding. The comparison of the experimental groups reveals that the adjusted mean for group EII and EIII is significantly higher than that of the group EI. Therefore, it is concluded that out of the three strategies under study, the Direct Instruction Model (Group EII) and the combination of Contingency Management Model & Direct Instruction Model (Group EIII) stand on much better position than the Contingency Management Model (Group EI) under the category of objective Understanding.

6.2.15 The results obtained from the comparison of the gain scores on Achievement in Commerce under the category of objective 'Understanding' shows that the experimental groups and control groups differ significantly with respect to their gain scores on achievement in Commerce under the category of objective-Understanding. The critical ratio is 4.70 for EI and EII, 1.19 for EII and EIII, 2.79 for EI and EIII, 7.77 for EI and C, 14.19 for EII and C and 9.94 for EIII and C respectively. The values are significant at the 0.01 levels.
except for the experimental groups EI & EIII. Hence the Behavior Modification Models are superior to the Conventional Activity Oriented Method with respect to achievement in Commerce under the category of objective-Understanding.

**COMPARISON OF ACHIEVEMENT IN COMMERCE UNDER THE CATEGORY OF OBJECTIVE–APPLICATION**

6.2.16 When the post-test scores of the experimental groups and control group are compared with respect to Achievement in Commerce under the category of objective Application, it was revealed that the experimental groups and control group are differs significantly. The critical ratio is 1.51 for EI and EII, 1.10 for EII and EIII, 2.51 for EI and EIII, 10.45 for EI and C, 14.49 for EII and C and 16.78 for EIII and C respectively. It is significant at the 0.01 level except for EI & EII, EI & EIII and EI & EIII. The ‘t’ value and the mean difference reveal that the Behavior Modification Models are more effective than the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective-Application.

6.2.17 The analysis of variance showed that there was no significant difference between the means of pre-test scores of the groups, (Fx = 0.20) which is not significant even at 0.05 level. But there was significant difference between the means of the post-test scores of the groups (Fy = 80.82), which is significant at 0.01 level. It indicates that the groups under study differ
significantly in their post-test achievement under the category of objective Application.

6.2.18 The analysis of covariance showed that the difference between the means of the post-test scores of the groups under study are statistically significant (F_{yx} = 80.98, P<0.01).

6.2.19 When the adjusted means were compared, the difference between the groups was found to be statistically significant at 0.01 level. The ‘t’ values obtained was 11.02 for EI & C, 12.73 for EII & C, 13.81 for EIII & C, 1.70 for EI & EII, 2.78 for EI & EIII and 1.07 for EII & EIII. The obtained values are significant at 0.01 level except for groups EI & EII and for EII & EIII. Since the adjusted means of experimental groups EI, EII and EIII are significantly higher than that of pupils in the control group C, the experimental groups are found superior in Commerce achievement under the category of objective Application. The comparison of experimental groups EI, EII and EIII revealed that significant difference exists between the experimental groups EI & EIII. Thus we can conclude the combination of Contingency Management Model & Direct Instruction Model (Group EIII) is better than the Direct Instruction Model (Group EII) on achievement in Commerce under the category of objective Application. As there is no significant difference between the groups EI & EII and EII & EIII, we cannot conclusively say that which method is more superior in performance but based on the values of adjusted mean scores, it is concluded that the combination of Contingency Management
Model & Direct Instruction Model (Group EIII) is little better than Direct Instruction Model (Group EII) and Direct Instruction Model (Group EI) is little better than the Contingency Management Model (Group EI) with respect to the category of objective-Application.

6.2.20 Comparison of the gain scores on Achievement in Commerce under the category of objective-Application shows that the experimental groups and control group differ significantly in their gain scores. The critical ratio is 1.75 for EI and EII, 0.58 for EII and EIII, 2.13 for EI and EIII, 11.13 for EI and C, 13.17 for EII and C and 11.77 for EIII and C respectively. It is significant at the 0.01 levels except for between the experimental groups EI & EII and for EII & EIII. The mean gain scores of the experimental groups are significantly higher than that of the control group. Thus it is concluded that the Behavior Modification Models are superior to the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective-Application.

**COMPARISON OF ACHIEVEMENT IN COMMERCE UNDER THE CATEGORY OF OBJECTIVE-ANALYSIS**

6.2.21 When the post-test scores of the experimental groups and control group are compared with respect to Achievement in Commerce under the category of objective Analysis, it was revealed that the experimental groups and control group differ significantly. The critical ratio is 1.50 for EI and EII, 1.10 for EII and EIII, 0.89 for EI and EIII, 21.54 for EI and C, 29.04 for EII and C and
23.05 for EIII and C respectively. It is significant at the 0.01 level except for the experimental groups EI, EII & EIII. The ‘t’ value and the mean difference reveal that the Behavior Modification Models are more effective than the Conventional Activity Oriented Method of teaching with respect to Achievement in Commerce under the category of objective-Analysis.

6.2.22 The analysis of variance showed that there was no significant difference between the means of pre-test scores of the groups, (Fx = 1.31) which is not significant even at 0.05 level. But there was significant difference between the means post-test scores of the groups (Fy = 40.58), which is significant at 0.01 level. It indicates that the groups under study differ significantly in their post-test achievement under the category of objective-Analysis.

6.2.23 The analysis of covariance showed that the difference between the means of the post-test scores of the groups under study are statistically significant (Fyx = 40.24, P<0.01).

6.2.24. When the adjusted means of the groups were compared, the difference between them was found to be statistically significant at 0.01 level. The ‘t’ values obtained was 7.66 for EI & C, 9.01 for EII & C, 9.75 for EIII & C, 1.34 for EI & EII, 2.09 for EI & EIII and 0.74 for EII & EIII. The obtained values are significant at 0.01 level except for groups EI & EII, for EI&EIII and for EII & EIII. For groups EI & EIII the calculated value is significant at 0.05 level. Since the adjusted means of students in the experimental groups are significantly greater than that of students in the control group, it can be
concluded that the experimental groups are found superior in Commerce Achievement under the category of objective Analysis. The comparison of experimental groups reveals that the combination of Contingency Management Model & Direct Instruction Model (Group EIII) stands on much better position than the Contingency Management Model (Group EI). As there is no significant difference between the groups EI & EII and EII & EIII, we cannot conclusively say which method is more superior in performance but based on the values of adjusted mean scores, we can conclude that the combination of Contingency Management Model & Direct Instruction Model (Group EIII) is little better than Direct Instruction Model (Group EII) and Direct Instruction Model (Group EII) is little better than the Contingency Management Model (Group EI).

6.2.25 Comparison of the gain scores on Achievement in Commerce under the category of objective-Analysis shows that the experimental groups and control group differ significantly with respect to their gain scores on achievement in Commerce under the category of objective-Analysis. The critical ratio is 2.11 for EI and EII, 0.07 for EII and EIII, 1.97 for EI and EIII, 6.14 for EI and C, 9.95 for EII and C and 8.76 for EIII and C and it is significant at the 0.01 levels except for between the experimental groups. The calculated value is significant at 0.05 level for groups EI&EII and EI&EIII. For the groups EII & EIII the calculated value is not significant even at 0.05 level. The mean gain scores of the experimental groups are significantly
higher than that of the control group. Thus it is concluded that the Behavior Modification Models are superior to the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective-Analysis.

**COMPARISON OF ACHIEVEMENT IN COMMERCE UNDER THE CATEGORY OF OBJECTIVE -SYNTHESIS**

6.2.26. When the post-test scores of students in the experimental groups and control group are compared with respect to Achievement in Commerce, it was revealed that the experimental groups and control group differ significantly. The critical ratio is 3.50 for EI and EII, 0.17 for EII and EIII, 3.62 for EI and EIII, 8.1704 for EI and C, 16.17 for EII and C and 16.34 for EIII and C respectively. It is significant at the 0.01 level except for between the experimental groups. The 't' value and the mean difference reveal that the Behavior Modification Models are more effective than the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective-Synthesis.

6.2.27 The analysis of variance showed that there was no significant difference between the means of pre-test scores of the experimental groups and control group, (Fx = 0.29) which is not significant even at 0.05 level of significance. But there was significant difference between the means of the post-test scores of the groups (Fy=80.72), which is significant at 0.01 level. It indicates
that the groups under study differ significantly in their post-test achievement under the category of objective-Synthesis.

6.2.28 The analysis of covariance of the groups showed that the difference between the means of the post-test scores of the groups under study are statistically significant (Fyx = 80.24, P<0.01).

6.2.29 When the adjusted means of the post-test scores of the groups were compared, the difference between them was found to be statistically significant at 0.01 level. The ‘t’ values obtained was 9.34 for EI & C, 13.36 for EII & C, 13.51 for EIII & C, 4.01 for EI & EII, 4.16 for EI & EIII and 0.14 for EII & EIII. The obtained values are significant at 0.01 level except of groups EII & EIII. Since the adjusted means of the experimental groups are significantly higher than that of students in the control group, the experimental groups are found superior in Commerce achievement under the category of objective Synthesis. The comparison of the experimental groups reveals that the adjusted mean for groups EII and EIII is significantly higher than that of the group EI. Therefore, we can conclude that out of the three experimental strategies under study, the Direct Instruction Model (Group EII) and the combination of Contingency Management Model & Direct Instruction Model (Group EIII) stand on much better position than the Contingency Management Model (Group EI).

6.2.30 Comparison of the gain scores on Achievement in Commerce under the category of objective-Synthesis shows that the groups differ significantly with
respect to their gain scores on Achievement in Commerce. The critical ratios are 3.94 for EI and EII, 0.11 for EII and EIII, 3.22 for EI and EIII, 7.81 for EI and C, 12.34 for EII and C and 10.14 for EIII and C respectively. It is significant at 0.01 level except for the experimental groups EII & EIII. The mean gain scores of the experimental groups are significantly higher than that of the control group. Hence the Behavior Modification Models are superior to the Conventional Activity Oriented Method with respect to achievement in Commerce under the category of objective-Synthesis.

COMPARISON OF ACHIEVEMENT IN COMMERCE UNDER THE CATEGORY OF OBJECTIVE-EVALUATION

6.2.31 When the post-test scores of the experimental groups and control group are compared with respect to Achievement in Commerce under the category of objective Evaluation, it was revealed that the experimental groups and control group are differs significantly. The critical ratio is 0.36 for EI and EII, 0.24 for EII and EIII, 0.64 for EI and EIII, 8.26 for EI and C, 8.06 for EII and C and 8.95 for EIII and C respectively. The ‘t’ value and the mean difference reveal that the Behavior Modification Models are more effective that the Conventional Activity Oriented Method with respect to Achievement in Commerce under the category of objective Evaluation.

6.2.32 The analysis of variance showed that there was no significant difference between the means of pre-test scores of the experimental groups and control group, (Fx = 2.26) which is not significant even at 0.05 level but there was
significant difference between the means of the post-test scores of the groups (Fy=32.77), which is significant at 0.01 level. It indicates that the groups under study differ significantly in their post-test achievement under the category of objective-Evaluation.

6.2.33 The analysis of covariance of the groups showed that the difference between the means of the post-test scores of the groups under study are statistically significant (Fyx = 32.41, P<0.01).

6.2.34 When the adjusted means of the groups were compared, the difference between them was found to be statistically significant at 0.01 level. The ‘t’ values obtained was 7.74 for EI & C, 8.20 for EII & C, 8.40 for EIII & C, 0.46 for EI & EII, 0.66 for EI & EIII and 0.19 for EII & EIII. Since the adjusted means of all the experimental groups are significantly higher than that of pupils in the control group, the experimental groups are found superior in Commerce achievement under the category of objective-Evaluation. The comparison of the experimental groups with regard to their performance shows that there is no significant difference between the groups. By comparing the adjusted mean scores, it is concluded that, among the three strategies under study the combination of Contingency Management Model & Direct Instruction Model (Group EIII) is little better than the Direct Instruction Model (Group EII) and Contingency management Model (Group EI) in performance. Similarly the Direct Instruction Model (Group EII) is little
better than the Contingency Management Model (Group EI) with regard to their Achievement in Commerce.

6.2.35 Comparison of the gain scores on Achievement in Commerce under the category of objective-Evaluation shows that the experimental groups and control group differ significantly with respect to their gain scores. The critical ratio is 0.83 for EI and EII, 0.83 for EII and EIII, 0.22 for EI and EIII, 6.51 for EI and C, 5.11 for EII and C and 6.70 for EIII and C respectively. It is significant at the 0.01 level except for the experimental groups EI, EII & EIII. The mean gain scores of the experimental group are significantly higher than that of the control group. Thus it is concluded that the Behavior Modification Models are superior to the Conventional Activity Oriented Method with respect to achievement in Commerce under the category of objective-Evaluation.

**COMPARISON OF COMMERCE INTEREST**

6.2.36 When the post-test scores of students in the experimental groups and control group are compared with respect to their Interest in Commerce, it was revealed that the groups differ significantly. The critical ratios are 1.43 for EI and EII, 1.24 for EII and EIII, 0.15 for EI and EIII, 6.51 for EI and C, 8.33 for EII and C and 6.44 for EIII and C respectively. It is significant at the 0.01 level except for between the experimental groups. The ‘t’ values reveal that the Behavior Modification Models are more effective than the Conventional Activity Oriented Method with respect to their Interest in Commerce.
6.2.37. The analysis of variance showed that there was no significant difference between the means of pre-test scores of the groups, $(F_x = 1.14)$ which is not significant even at 0.05 level but there was significant difference between the means of the post-test scores of the groups $(F_y=14.21)$, which is significant at 0.01 level. It indicates that the groups under study differ significantly in the post-test with regard to their Interest in Commerce.

6.2.38. The analysis of covariance of the groups showed that the difference between the means of the post-test scores of the groups under study are statistically significant $(F_{yx} = 19.66, P<0.01)$.

6.2.39 When the adjusted means of the groups were compared, the difference between them was found to be statistically significant at 0.01 level. The ‘t’ values obtained was 5.50 for EI & C, 7.07 for EII & C, 5.83 for EIII & C, 1.56 for EI & EII, 0.33 for EI & EIII and 1.23 for EII & EIII. The obtained value is significant at 0.01 level except for between the experimental groups EI, EII and EIII. Since the adjusted means of all the experimental groups are significantly higher than that of the control group, the experimental groups are found superior in their Interest in the subject Commerce. The comparison of the experimental groups with regard to their Interest in Commerce shows that there is no significant difference between them, but by comparing the adjusted mean scores, it is concluded that the Direct Instruction Model (Group EII) is little better than the combination of Contingency management Model & Direct Instruction Model (Group EIII) and the Contingency Management Model.
(Group EI) in their Interest in Commerce. Similarly combination of Contingency management Model & Direct Instruction Model (Group EIII) is little better than the Contingency Management Model (Group EI) with regard to their Interest in Commerce.

6.2.40 Comparison of the gain scores on Commerce Interest shows that the experimental groups and control groups differ significantly with respect to their gain scores on Interest in Commerce. The critical ratio is 1.25 for EI and EII, 1.63 for EII and EIII, 0.36 for EI and EIII, 5.97 for EI and C, 7.91 for EII and C and 5.50 for EIII and C respectively. It is significant at the 0.01 level except for the experimental groups EI, EII and EIII. Hence the application of Behavior Modification Models is superior to the Conventional Activity Oriented Method with respect to Interest in Commerce of students at Higher Secondary Level.

**COMPARISON OF ATTITUDE TOWARDS COMMERCE**

6.2.41 When the post test scores of students in the experimental groups and control group are compared with respect to their Attitude towards the subject Commerce, it was revealed that the experimental groups and control group differs significantly. The critical ratio is 2.26 for EI and EII, 0.79 for EII and EIII, 1.29 for EI and EIII, 5.89 for EI and C, 7.85 for EII and C and 6.29 for EIII and C respectively. It is significant at the 0.01 level except for between the experimental groups EII&EIII and EI&EIII. The significant ‘t’ values reveals that the Behavior Modification Models are more effective that the Conventional Activity Oriented Method with respect to Attitude towards Commerce.
6.2.42 The analysis of variance showed that there was no significant difference between the means of pre-test scores of the experimental groups and control group, \((F_x = 0.73)\) which is not significant even at 0.05 level but there was significant difference between the means of the posttest scores of the groups \((F_y = 19.25)\), which is significant at 0.01 level. It indicates that the groups under study differ significantly in their post-test with respect to their Attitude towards the subject Commerce.

6.2.43 The analysis of covariance showed that the difference between the means of the post-test scores of the groups under study are statistically significant \((F_{yx} = 18.56, P<0.01)\).

6.2.44 When the adjusted means of the post test scores of groups were compared, the difference between them was found to be statistically significant at 0.01 level. The ‘t’ values obtained was 4.47 for EI & C, 6.90 for EII & C, 5.95 for EIII & C, 2.42 for EI & EII, 1.4817 for EI & EIII and 0.94 for EII & EIII. The obtained values are significant at 0.01 level except for between the experimental groups EI, EII & EIII. Since the adjusted means of experimental groups are significantly higher than that of the control group, the experimental groups are found superior in their Attitude towards Commerce. The comparison of the experimental groups with regard to their Attitude towards Commerce shows that there is no significant difference between the groups EI & EIII and groups EII & EIII. The calculated value of ‘t’ is significant at 0.05 level for experimental groups EI & EII. Thus it is concluded from
the adjusted mean scores that group EII is little better than group EIII and group EIII is little better than group EI with regard to their Attitude towards Commerce.

6.2.45. Comparison of the gain scores on Attitude towards Commerce shows that the experimental groups and control group differ significantly with respect to their gain scores on Attitude towards Commerce. The critical ratio is 2.42 for EI and EII, 0.71 for EII and EIII, 1.40 for EI and EIII, 4.70 for EI and C, 6.23 for EII and C and 4.82 for EIII and C respectively. It is significant at the 0.01 level except for between the experimental groups EI, EII and EIII. Since the mean score of the experimental groups are higher than that of the control group, it is concluded that the Behavior Modification Models are superior to the Conventional Activity Oriented Method on Attitude of students towards Commerce at Higher Secondary Level.

6.3 TENABILITY OF THE HYPOTHESES

The hypotheses formulated in the study were: -

HYPOTHESES I

*The Achievement in Commerce of students at Higher Secondary Level taught using Behavior Modification Models of Teaching is significantly higher than that of students taught using the Conventional Activity Oriented Method.*

Finding numbers 6.2.1, 6.2.2, 6.2.3, 6.2.4 and 6.2.5 indicate that the achievement in Commerce of students learned through Behavior Modification Models have more achievement than those who learned through the Conventional Activity Oriented Method of teaching Hence the above hypothesis is substantiated.
HYPOTHESES II

The achievement in Commerce of students at Higher Secondary Level taught using Behavior Modification Models of Teaching is significantly higher than that of students taught using the Conventional Activity Oriented Method with respect to categories of objectives—Knowledge, Understanding, Application, Analysis, Synthesis and Evaluation.

Finding numbers 6.2.6, 6.2.7, 6.2.8, 6.2.9, 6.2.10, 6.2.11, 6.2.12, 6.2.13, 6.2.14, 6.2.15, 6.2.16, 6.2.17, 6.2.18, 6.2.19, 6.2.20, 6.2.21, 6.2.22, 6.2.23, 6.2.24, 6.2.25, 6.2.26, 6.2.27, 6.2.28, 6.2.29, 6.2.30, 6.2.31, 6.2.32, 6.2.33, 6.2.34, and 6.2.35 indicate that the achievement in Commerce of students learned through Behavior Modification Models under various categories of objectives such as Knowledge, Understanding, Application, Analysis, Synthesis and Evaluation have more achievement than those who learned through the Conventional Activity Oriented Method of teaching. Hence the above hypothesis is substantiated.

HYPOTHESES III

The Interest in Commerce of students at Higher Secondary Level taught using Behavior Modification Models of Teaching is significantly higher than that of students taught using the Conventional Activity Oriented Method.

Finding numbers 6.2.36, 6.2.37, 6.2.38, 6.2.39, and 6.2.40 indicate that the students learned through Behavior Modification Models have more Interest in Commerce than the students who learned through the Conventional Activity Oriented Method of teaching. Hence the above hypothesis is substantiated.
HYPOTHESIS IV

The Attitude towards Commerce of students at Higher Secondary Level taught using Behavior Modification Models of Teaching is significantly higher than that of students taught using the Conventional Activity Oriented Method.

Finding numbers 6.2.41, 6.2.42, 6.2.43, 6.2.44, and 6.2.45 indicate that the students learned through Behavior Modification Models have more attitude towards the Commerce than the students who learned through the Conventional Activity Oriented Method of teaching. Hence the above hypothesis is substantiated

6.4 CONCLUSIONS BASED ON FINDINGS

The major conclusions that emerged from the study are given below.

Findings of the study with regard to the total achievement in commerce indicate that the students who learned through Behavior Modification Models have better achievement than those who studied through the Conventional Activity Oriented Method of teaching. Thus, the Behavior Modification Models are better than the Conventional Activity oriented Method of teaching on achievement in commerce of students at Higher Secondary level in their total achievement.

When the objective-wise (Knowledge, Understanding, Application, Analysis, Synthesis and Evaluation) achievement in commerce of the students in the experimental groups and control group are compared, the achievement in commerce of students who learned through the Behavior Modification Models are significantly higher than that of the students who learned through the Conventional Activity Oriented Method of teaching.
The analysis of data with regard to the Interest in Commerce of students who learned through the application of Behavior Modification Models shows that the students who learned through the application of Behavior Modification Morels have more interest towards commerce than those who learned through the Conventional Activity Oriented Method of teaching. Thus, the Behavior Modification Models are more effective than the Conventional Activity Oriented Method of teaching on increasing the Interest in Commerce of students at Higher Secondary level.

The attitude of students towards the subject Commerce, taught using Behavior Modification Models, are significantly higher than that of the students who taught using Conventional Activity Oriented Method of teaching. The Behavior Modification Models are found better than the existing Conventional Activity Oriented Method of teaching with respect the attitude of students towards Commerce at Higher Secondary level.

### 6.5 SUGGESTIONS FOR IMPROVING EDUCATIONAL PRACTICES

In a democratic country like India, education has its own worth. The commitment of our nation to ‘Education’ is reiterated by the Right to Education Act passed in the Parliament on 4 August 2009. The equality of education envisaged by the Indian Constitution will be meaningful only when equality of learning outcome becomes a goal of education. For this, the teachers must find ways of giving each child the help and encouragement he needs, rather than ensuring identical treatment of all children. If students are to attain equality of learning outcomes, unequal treatment may be needed at certain stages of learning process. The teachers can
use different strategies in teaching for the full utilization of the intellectual powers of the children, which will in turn help them to survive in the age of enormous technological and social complexity.

Since the Behavior Modification Models are practice oriented, it has implications of educational practitioners, educational planners, teacher educators and curriculum designers. The findings of the study suggest that, the teacher can tailor instruction to the needs of most of the students in the classroom by employing behavior modification models in the classroom. For this, it is desirable that the teachers should have a fresh look at their teaching approach in terms of the Behavior Modification Models. The major findings of the study holds that under appropriate conditions, a sizeable portion of the population can be brought to a high level of Achievement in the subject, Interest in the subject and Attitude towards the subject.

On the basis of the findings of the study, the following suggestions were made to improve the educational practices.

1. The experimental study revealed that the applications of behaviour modification models are more effective than the Conventional Activity Oriented Method for the student’s Achievement in Commerce, Interest in Commerce and Attitude towards Commerce at higher secondary level. Hence the application of this model by teachers should be encouraged while teaching Commerce at Higher Secondary Level for better Achievement in
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Commerce, for increasing the interest of students in Commerce and to develop Attitude towards Commerce among the Higher Secondary Students.

2. Since the Behavior Modification Models have been found more effective than the Conventional Activity Oriented Method in improving the Achievement, Interest and Attitude of the students, provision for teaching the models should be made in the teacher education curriculum and the teacher educators should be equipped to translate the model in their practice.

3. Teachers should be thorough with the theory and practice related to behavior modification models. In order to acquaint the teachers with the new developments in the area of models of teaching, in-service training should be organised from time to time in each and every subject to promote the use of models of teaching.

4. The teachers experiences difficulties in the preparation of lesson transcripts based on different models of teaching. Hence, lesson transcripts based on different models of teaching on selected units of all subjects may be developed by an expert team and should be made available to teachers for ready reference.

5. Even though the study shows that Behavior Modification Models are more effective than the Conventional Activity Oriented Method of teaching onAchievement in Commerce of Higher Secondary School Students, other model are also suitable for different areas of the subject. Hence teachers
may be given orientation to apply the different models judiciously in teaching each area of a subject.

6. In order to implement the models of teaching effectively, the teachers need theoretical orientation and practical guidance. Faculty improvement programmes namely, Orientation Classes, Refresher Courses, Seminars and Workshops should be organised for the teachers to familiarize them with various instructional strategies including Behavior Modification Models.

7. Most of the teachers in schools are very reluctant to change their method of teaching because of their negative attitude. Hence some measures may be taken in the government level to develop positive attitude among teachers for adopting effective and interesting instructional strategies in schools. The incorporation of models of teaching in the present day Activity Oriented Method is best suited to get optimum results in our Indian context. The concept of models of teaching and the syntax of different models must be made familiar to the Higher Secondary teachers.

8. The application of different models of teaching requires different instructional materials. The preparations of these materials by the teachers themselves are neither possible nor practicable. Hence it is essential that the curriculum developers may make packages of instructional materials which the teachers can utilise with minor adaptations to specific needs.
9. Since suitable libraries and reference facilities are not available in higher secondary school for practicing innovative methods, they should be equipped with suitable library and reference facilities including reading materials and supplementary materials on models of teaching. Simple books on models of teaching should be published in mother tongue and made available for the academic community to make clear the concepts of models of teaching.

10. Since the overcrowded class rooms and difficulty in maintaining discipline are two practical difficulties likely to be encountered by teachers while practicing the Models of Teaching, steps must be taken to revise the teacher-pupil ratio by reducing the number of students in the class.

11. The curriculum designers also should be given awareness on the models of teaching so that they can arrange the materials in hierarchical order, which helps to arouse the curiosity in children. For that reference materials on models for teaching should be made available to teachers and curriculum designers.

12. Much more efforts are needed in the actual preparation of curriculum and curricular materials, in teacher training and supporting research in the light of the challenges of the scientific and social revolution. Therefore, the curricula must be continuously re-examined and retailed to the needs and demands of the changes of times and growth of knowledge and techniques.
6.6 SUGGESTIONS FOR FURTHER RESEARCH

It is hoped that the present study would open new vistas for further research in the areas ‘Models of Teaching’. The investigator wishes to suggest the following desirable areas for further research.

1. The present study is conducted with regard to the achievement in commerce of students at higher secondary level. Studies can be conducted to investigate the effect of Behavior Modification Models on achievement of learners of different age groups, grade levels, subject areas, socio-economic status and intelligence level.

2. The study was intended only to evaluate the effectiveness behavior Modification Models on Achievement in Commerce, Interest in commerce and Attitude towards Commerce. This study can be extended to find out the effect of this model on the problem solving ability in commerce, management aptitude of students, decision making ability of students etc.

3. Similar studies can be conducted to find out the effectiveness of Behavior Modification Models among under achievers, slow learners, gifted children, learners with learning difficulty etc.

4. The study can be repeated for a large sample for longer duration representing all districts in the state and for different subjects to ensure the reliability of result.
5. Similar studies can be carried out using other models of teaching or combination of models from different families, which have not been attempted so far, among exceptional learners, on tribal students and students belonging to coastal area using

6. The curricular possibilities of Behaviour Modification Model and other models, the problems behind implementing the Models of teaching can be studied.

7. A survey can be conducted to study the attitude of teachers towards adopting new instructional strategies including the models of teaching.

8. New standardized tools can be developed to measure the nurturant effects of the model and the study may be repeated utilising a wider sample.

9. Teaching materials to orient Commerce curriculum to adapt this technique of teaching can be prepared and tested.

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