5.0.0 INTRODUCTION

It is being increasingly realised by the educational reformers, planners, practitioners and research workers in this country and abroad that there is an urgent need to find out the effective teaching behaviour through well-designed research and experimentation, taking into account the actual process of classroom teaching. Review of researches on teaching as have been provided in different sections of Chapter I, indicates that studies designed to analyse classroom teaching acquire their rationale from the fact that not only a full understanding of the process governing learning, but a clear and definite understanding of the complex phenomenon of teaching will be needed to ensure the desired learning
outcomes. To know how to teach is as important or, in one sense, perhaps more important than what to teach. It is because of the fact that with the same content there may be differential effect in learning according to the teaching style adopted by the teacher. The present experimental study has modestly addressed itself to this task of identifying an effective teaching style that may help the classroom teacher to produce better learning outcomes.

Research experts in the area of teaching and teacher behaviour like Gage (1968), Mitra (1972) and Buch (CASE, 1972) have drawn the attention of educational researchers towards a systematic and scientific analysis of the phenomenon of teaching. The Centre of Advanced Study in Education, Baroda, has located gaps in research in the area of teaching. It has been found that process-product experimental studies with the process variables as independent, and product variables as dependent variables demand attention on a priority basis especially in the cognitive domain of teacher behaviour. Accordingly Sharma (1972) and Padma (1975) attempted to identify the effective patterns of teaching behaviour, the former in terms of knowledge, comprehension and application objectives, and latter in terms of only application
objective. Although Sharma's teaching patterns could be differentiated for knowledge and comprehension objectives, the application objective remained unaffected by the different teaching patterns in both the studies. This induced the present investigator to look into the phenomenon of teaching from the standpoint of the concept of teaching style and find out experimentally the effect of selected styles of teaching on the development of knowledge, comprehension and application abilities as well as on the total attainment of the pupils in a given learning situation in the classroom.

5.1.0 Classroom Questioning and Teaching Style

One of the central problems of research in the area of teaching and teacher behaviour has been the selection of a set of concepts to describe what goes on in the classroom. On the basis of review of research it has been found that the concept of teaching style may be utilised to locate meaningful teaching behaviours of the classroom teacher. Questioning forms one of the essential elements of teaching style. Since all teaching is dyadic, response is another element of the style of teaching. The third element of teaching style is the feedback given by the teacher which is very likely to influence learning effect. Differential use
of these teaching behaviours, viz., questioning, response and feedback, on the part of the teacher will give rise to different styles of teaching. For example, if questioning behaviour is rarely adopted by the teacher, the style will be 'lecturing.' Three styles of teaching have been considered for the study, the description of which has been given in a later section. These styles of teaching have been manipulated as treatment variables against a set of criterion variables related to pupil achievement in terms of knowledge, comprehension and application.

5.2.0 Statement of the Problem

The title of the present study reads as: 'Classroom Questioning and Pupil Achievement: An Enquiry into Teaching Style'. It is an experimental study conducted in the real classroom situation to find out the effects of three styles of teaching on the development of knowledge, comprehension and application abilities as well as the total achievement of the pupils in a given teaching-learning situation. The pupils were of class VIII and the content for teaching was selected from geography.

After analysing research literature especially the conceptual framework provided by researchers on teaching and teacher behaviour till date a few variables were selected, viz., teacher classroom questioning, response given by the
pupils and the feedback given by the teacher. Out of these three variables, in some combinations, three styles of teaching were developed. These are given below:

(i) Style $S_1$: Lecturing
(ii) Style $S_2$: Questioning and response (without feedback)
(iii) Style $S_3$: Questioning-response-feedback sequence

These three styles of teaching formed the independent or treatment variables of the study while the pupils' attainment in terms of knowledge, comprehension, application and total achievement acted as dependent or criterion variables in the present experiment.

5.3.0 Objectives of the Study

The study was undertaken with the major objective of finding out the relative effectiveness of the three styles of teaching, viz., lecturing ($S_1$), questioning and response - without feedback ($S_2$), and questioning - response - feedback sequence, upon the pupil achievement for the instructional objectives of knowledge, comprehension, application and total achievement belonging to cognitive domain of educational objectives.
5.4.0 Hypotheses

The study tested the following null hypotheses:

(i) There will be no significant difference in the mean achievement score for knowledge when the pupils are taught by either of the three styles $S_1$, $S_2$ or $S_3$.

(ii) There will be no significant difference in the mean achievement score for comprehension when the pupils are taught by either of the three styles $S_1$, $S_2$ or $S_3$.

(iii) There will be no significant difference in the mean achievement score for application when the pupils are taught by either of the three styles $S_1$, $S_2$ or $S_3$.

(iv) There will be no significant difference in the mean total achievement score when the pupils are taught by either of the three styles $S_1$, $S_2$ or $S_3$.

5.5.0 Assumptions

The experiment of the study was conducted on the following assumptions:

(i) There are certain styles of teaching which the teacher should create in the classroom.

(ii) The teacher can be programmed to produce these styles of teaching.
(iii) Knowledge, comprehension and application abilities are measurable with multiple choice items.

(iv) The above mentioned abilities are common across various units of geography teaching.

(v) As the teacher is programmed there is no carry over effect in the teacher behaviour from one style of teaching to another.

5.6.0. Design and Procedure

A pre-test, post-test design was used to identify the effect of three treatments (three styles of teaching) on the four criterion variables (knowledge, comprehension, application and total achievement). This can be represented as follows:

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Pre-Test:        Treatment:        Post-Test:
                 5 units of geography taught to 3 different classes in 3 different styles of teaching
Pre-achievement Test in Geography:  Post-achievement test in Geography
Int. Test
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The pupils were randomly divided into three groups and all the units (five) were taught to each group in a particular style. For this purpose, simple randomised design was employed in this experimental study. This has
been represented in the following Table 5.1.

**Table 5.1: The Experimental Plan of Simple Randomised Design**

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$</td>
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<td>$X_1$</td>
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</tr>
<tr>
<td>$X_2$</td>
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<td></td>
</tr>
<tr>
<td>$X_{34}$</td>
<td>$X_{33}$</td>
<td>$X_{31}$</td>
<td></td>
</tr>
</tbody>
</table>

The subscript in each entry refers to units, i.e., pupils in each treatment group. It is indicated that in the present experiment the numbers of pupils in the treatment groups were unequal.

5.6.1. Sample

The experiment necessitated selection of teacher and pupil.

**Teacher:**

In this experiment that kind of teacher was needed, who could be programmed and who could decide and change the styles of teaching as required by the design of the study. In order to avoid inter-teacher variation as has
been mentioned in captions 2.1.0 and 2.3.0, it was decided to involve only one teacher. The investigator satisfied all the requirements and himself acted as the teacher.

Pupils:

The sample of the pupils comprised the standard VIII boys and girls of one of the English medium schools of Baroda city, namely, the Baroda High School. Although doing the experiment in one school caused some bias in sampling this was resorted to for avoiding inter-school differences in climate of the classroom and other administrative difficulties in conducting the experiment. The experiment required pupils who could respond to the teaching planned for the development of all the three instructional objectives, viz., knowledge, comprehension and application. In the selected school there was a large number of students in standard VIII with three classes. Therefore, it was felt that the pupils of standard VIII would suit the purpose.

The experiment started with 130 boys and girls of standard VIII of the Baroda High School, but at the end of the experiment some subjects had to be rejected from the sample because they were either absentees or very
irregular. Ultimately, the total sample came to be 98 with 34, 33 and 31 in classes C1, C2, C3 respectively. In the class C1 there were 22 boys and 12 girls, in C2 there were 24 boys and 9 girls, and in class C3 there were 16 boys and 15 girls making thereby 62 boys and 36 girls in the total sample. The mean and SD of the three groups in respect of their age, intelligence and pre-achievement were appreciably similar, and in these respects the three experimental classes of standard VIII formed quite comparable groups.

5.6.2. Treatment

The teaching of the five selected units of standard VIII geography according to the three styles of teaching developed for the experiment, formed the experimental treatments. In order that the teacher might follow the teaching styles strictly, a detailed lesson plan for each lesson of each unit in each teaching style (2 lessons x 5 units x 3 styles, i.e. there were thirty lessons in all) was prepared long before the start of the experiment. A sample lesson plan in each style is given in Appendix C. The content covered in any lesson of a unit was kept same in all the corresponding lessons of the three styles of
teaching. Even the teaching aid used, examples given and blackboard work done, were kept scrupulously the same from one style to the other.

5.7.0. Tools Used

In order to measure different variables of the study the following tools were employed:

(i) The Shah's Non-verbal Group Test of Intelligence: This tool was used to measure IQ of pupils.

(ii) The Pre-achievement Test in Geography: This test measured pre-achievement of the pupils in terms of knowledge, comprehension, application and total achievement.

(iii) The Post-achievement Test in Geography. This tool was used to measure achievement of the pupils in terms of knowledge, comprehension, application and total achievement after their learning geography during the experimental teaching period.

The first of these tests is a standardised intelligence test. The second and the third tool were developed by the investigator for the purpose of the study. A copy of each of these tests is included in Appendix A and B.

5.8.0. Statistical Techniques used

Bartlett's Test was employed to ensure homogeneity of variance of the experimental data. Three-way analysis of variance was used to find out the significant treatment effects due to the three styles of teaching. Analysis of Covariance
was employed to control the influence of the intervening variables of pre-achievement and intelligence on the treatments. t test was applied to find out the significant difference in the treatment means after adjustment through covariance analysis.

5.9.0. Conclusions

From the discussion and interpretation of the results of the experiment the following conclusions were reached:

(i) The three teaching styles (S₁, S₂ and S₃) have equal effects on the development of knowledge ability of the sample pupils.

(ii) The three styles of teaching have equal effects on the development of application ability of the sample pupils.

(iii) The three styles of teaching have equal effects on the total achievement of the sample pupils.

(iv) The three styles of teaching have differential effects on the development of comprehension ability of the sample pupils. Significance test of the adjusted means of the three teaching styles (S₁, S₂ and S₃) shows that S₁ differs significantly from S₃ at 0.05 level and not from S₂. S₂ and S₃ do not differ significantly at the same level.

5.10.0 SUGGESTIONS FOR FURTHER RESEARCH

Any research raises more problems and issues than it proposes to solve. It is hoped that the present study will encourage, stimulate and even provoke further researches in
the area of teaching and teacher behaviour. Based on the present study a few suggestions are made below:

(i) The study may be replicated with a more broad-based sample.

(ii) The study may be repeated with longer exposure of treatments.

(iii) The study may be repeated with other units of geography.

(iv) The study may be repeated with units of teaching from other subjects.

(v) Studies may be undertaken with newer concepts of teaching style.

(vi) Studies may be undertaken to see if the school climate influences the styles of teaching.