Science Process Skills in Teaching and Learning

Puran Chandra Bhatt

Commonwealth Publishers
NEW DELHI-110002
(INDIA)

ISBN 81—900069—0-8

First Edition—1988

Published by:

Commonwealth Publishers
4378/4B Gali Murari Lal, Ansari Road,
Darya Ganj, New Delhi—110002

Printed at: Taruna Enterprises
Anup Market, Yamuna Vihar Road
Maujpur, Delhi

SCIENCE PROCESS SKILLS IN TEACHING AND LEARNING

PREFACE

The object of the present study was to construct and standardize a Test of Science Processes, to study the Structure of Science Processes, to compare the understanding of various Science Processes and to evaluate Sex-differences and Socio-Economic influences in the understanding of Science Processes of the Eighth Grade Students of Control Schools, where the Integrated Science Curriculum developed by the National Council of Educational Research and Training is being followed in the Middle School Classes.

This area of research has not been explored by the research workers in India at all and this study may be rightly claimed as a pioneer venture in the field. Except a few studies, mostly connected with the construction of achievement tests in Science, the entire field of the study of learning behaviours in Science is open for investigation. The present study is a humble attempt to give a scientifically sound base to the problem so that other research workers may enter the field and explore it in greater depth, in order to make some effective recommendations to educational policy makers in science education, regarding the importance of the understanding of Science Processes in teaching and learning science.

In the first chapter of the report an attempt is made to define the various Science Processes, the Intellectual Development and the importance of the problem under study.

In the second chapter the related studies, mostly made in U.S.A. have been discussed along with a brief description of the development of Measurement and Testing.

The methodology involved in the Present investigation has been detailed in the third Chapter.

The fourth chapter gives the steps taken to establish the Reliability and Validity of the test and its use in simple Regression Analysis.

The fifth and sixth chapter deal with the Statistical Analysis of data along with the discussions and interpretations with regard to the objectives of the study.

The seventh Chapter in brief gives the Summary of the Test of Science Processes, Conclusions drawn as a result of the present study and their implications and suggestions for further study. This in turn is followed by the relevant Bibliography and Appendix.

The investigater owes much to many people who, on many counts helped in one way or other, in what resulted in this work, but he has no words to express his gratitude to Dr. R.N. Pandey, who infused, encouraged and guided this research work, with enlightened philosophical out look.

He is greatly indebted to the Principals, teachers and students of Central Schools, with whose help and active participation, alone this research work could see through.

Thanks are also to the experts from the National Council of Educational Research and Training, New Delhi for their kind help at the different stages of the project.

He is thankful to the Kendriya Vidyalaya Sangathan (Central School Organisation) for giving him necessary permission to undertake this research work.

His sincere thanks to his wife and children, who have borne this venture of his with great patience and admirable co-operation.

Principal
Kendriya Vidyalaya,
Ranikhet (U.P.)
April 14 1983.

(P.C. BHATT)

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1

INTRODUCTION

BACKGROUND OF THE PROBLEM

According to Fitzpatrick (1960) "Science is a cumulative and endless series of empirical observations which result in the formation of concepts and theories, with both concepts and theories being subject to modification in the light of further empirical observations. Science is both a body of knowledge and the process of acquiring it."

The Columbia Encyelopedia (1963) defines science as "An accumulated and systematised learning, in general usage, restricted to natural phenomenon. The progress of science is marked not only by an accumulation effect, but by the emergence of scientific method and of scientific attitude."

From these two definitions, three basic principles of the nature of science can be identified:

(i) An accumulated and systematized body of knowledge,

(ii) The scientific method of enquiry, and

(iii) The scientific attituded. The first point indicates the *Product* of science, while second the third points indicate the *Process* of science. In other words, science is both a product and process.