



RESEARCH ARTICLE

A STUDY OF THE PERCEPTION OF TEACHERS TOWARDS NCERT SCIENCE TEXTBOOKS AT UPPER PRIMARY STAGE

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ABSTRACT

Since the image of science presented in classrooms is by and large limited to textbooks, there is need for balanced representation of all aspects of science in these. The messages contained in a text influence how the users perceive the subject (primarily students but also teachers). A textbook, which emphasizes scientific facts, explanation of concepts and principles would probably "tell" the reader that science is a neatly organized body of knowledge. If the text contains questions and activities that require the user to solve, he / she may think of science as an investigative process. A textbook, which describes how scientists work and traces the historical developments of scientific ideas, is likely to imply that science, is a human endeavor. In today's world, science, technology and society in textbooks would indicate to students the relevance of science; its positive and negative effects and the influence science and society have on each other. In India, the textbook still remains an important tool in classroom transactions associated with the teaching and learning of science. The present study is thus an attempt to gauge the perception of teachers towards NCERT textbooks of Science at upper primary stage.

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INTRODUCTION

Science is knowledge and knowledge is power. With power can come wisdom and liberation. The science textbooks produced by the National Council for Educational Research and Training (NCERT) for the Upper Primary classes (VI-VIII) are used in a number of schools and also provide a foundation for many succeeding science textbooks produced by the states and private publishers. The image of science presented in classrooms is by and large limited to the textbooks. Weakness in textbook content and therefore ineffective approaches of teaching may prevent textbook reading from being effective. The objectives of science education state that students should understand the tentative and divergent nature of science. The present study explored how the teachers perceive the newly developed science textbooks by NCERT at the Upper Primary level with respect to the representation of science. The findings pertaining to perception of teachers towards NCERT science textbooks threw light that most of the teachers favour the fact that these textbooks are able to provide different aspects of scientific literacy to its users despite certain limitations.

The textbooks for the Upper Primary classes, therefore, require inclusion of both activities and abstract concepts and thought processes. Although the NCERT science textbooks provide emphasis for the recall/information aspect of science, yet a more balanced approach with emphasis on both the content and investigative processes of science is needed to be incorporated in these textbooks.

Need and Rationale of the Study

The teachers use the textbooks to define the syllabus or to identify the curriculum and many times teach from it, while students use it to prepare for examinations. The importance therefore of the textbook necessitates an analysis to determine how they portray science. The science textbooks produced by the National Council for Educational Research and Training (NCERT) for the Upper Primary classes have been selected for analysis. These textbooks are used in a number of schools and provide a foundation for many succeeding science textbooks produced by the states and private publishers. The Upper Primary level of schooling has been chosen, as this constitutes one block. Also, since there is no board examination at the end of class VIII, the teachers as well as the students would not be under pressure to cover content. It would also be easier to incorporate changes at this level.

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The significance of the present study is to assess the perception of teachers towards NCERT science textbooks of the Upper Primary level of schooling (classes VI to VIII). Since textbooks play a major role in the teaching and learning of science, it necessitates a need to analyse them for their presentation of science. The present study provides a description of textbooks (NCERT) with reference to various aspects of scientific literacy since this is a necessary requirement for curricular evaluation. The results would definitely help teachers to choose a textbook or make modifications in their teaching by incorporating the aspects found inadequate in the textbooks. Scientific literacy had been chosen as the theme for assessment due to the emphasis given for developing scientifically literate citizens in the "Science for All" programme launched in India.

Operational Definition of Key Terms

Perception: An attitude or understanding based on what is observed or thought.

Science: Organised knowledge gained through science activity, frequently used with a qualifying Adjective to indicate a special branch of study; for example, Biological Science, Physical Science or Social Science.

Textbook: A book dealing with a definite subject of study, systematically arranged, intended for use at a specified level of instruction and used as a principal source of study material for a given course.

Upper Primary Stage: The stage of Elementary Education between Primary and Secondary level, which includes classes VI to VIII.

Objectives of the Study

- To find out teachers' perception of science in science textbooks at Upper Primary stage.
- To assess the representation of science in science textbooks at Upper Primary stage.
- To analyze the relevance of textbooks in the daily life of the learner from teacher's perspective.
- To obtain suggestions of teachers for further scope of improvement of NCERT textbooks at the Upper Primary stage.

Research Design

Methodology: The present study lies in the realm of descriptive research and employed survey method to collect data for the said study. Surveys gather data at a particular point of time with the intention of describing the nature of existing conditions. The focus of the study is schools or educational systems, therefore it was a school survey. Both the purposes of survey research i.e. Description and Explanation have been fulfilled.

Sample: The sample for the study had been taken through purposive sampling. The sample included 10 Government and Public Schools of North-West Delhi region and the sample size were 50 science teachers teaching in classes VI to X from all the schools.

Tool: For the present study, a self made five-point rating scale comprising of 30 statements was prepared and used to gauge the perception of teachers with respect to representation of science in textbooks and their relevance in daily life of learners'.

Techniques of Data Analysis

The data was analyzed using the Frequency and Percentage Analysis Techniques. Based on the rating key provided in the tool itself, the scoring of the tool has been done manually for the rating scale and thereafter frequency and percentage analysis was undertaken.

Findings

The present study has elicited the affirmative view of science teachers regarding NCERT science textbooks of upper primary level with respect to representation of science in these to the maximum extent, as most of the teachers have favored the statements being provided in the rating scale. An overview of the findings pertaining to the rating scale reads as being given below:

- The results obtained indicate that majority of teachers i.e. 44% of the teachers strongly agreed and 40% teachers agreed with the above said statement whereas 6% remain undecided. On the other hand 4% teachers disagreed and 4% teachers strongly disagreed respectively that content in the chapters of the NCERT science textbooks is logically sequenced.
- The results suggested that 28% teachers strongly agreed, 60% agreed with the statement. On the other hand 6% remain undecided and 4% disagreed with the same that NCERT science textbooks are equipped with suitable examples that support the content.
- Most of the teachers i.e. 52% strongly agreed and 28% agreed with the above given statement whereas 18% teachers were undecided, 2% disagreed and 6% strongly disagreed that NCERT science textbooks move from simple to complex with respect to various science concepts.
- The result suggested that 14% teachers strongly agreed, 40% agreed and 28% remain undecided with the above given statement. On the contrary 12% teachers disagreed and 6% strongly disagreed that NCERT science textbooks provide information on resources that could be used to enrich text materials.
- Most of the teachers i.e. 24% strongly agreed, 62% agreed with the given statement and 6 remain undecided, whereas 2% disagreed and 4% strongly disagreed therefore it was easily deduced that NCERT science textbooks provide activities that are congruent with the learning characteristics of upper primary students.
- The results indicated that 26% teachers strongly agreed and 34% teachers agreed with the given statement and 34% remain undecided whereas 2% disagreed and 4% strongly disagreed respectively. From the above results it was inferred that NCERT science textbooks provide opportunity for hands-on activities in the classroom.
- The results obtained indicated that 14% teachers strongly agreed and 46% teachers agreed while 34% remain undecided. On the other hand 4% teachers disagreed and 2% strongly disagreed that NCERT

science textbooks provide co-operative learning activities in the classroom.

- A majority of teachers i.e. 78% strongly agreed, 18% agreed with the given statement and 6% remain undecided. On the contrary only 2% disagreed that NCERT science textbooks are provided with the interactive ways in which the team of Bujho and Paheli makes the learning enjoyable and fun.
- The results indicated that 8% teachers strongly agreed, 56 % teachers agreed and 20% remain undecided while 12% disagreed and 2% strongly disagreed that NCERT science textbooks cater to individual differences of the learners.
- The results indicated that 66% teachers strongly agreed, 26% agreed and 6% remain undecided while 4% disagreed that the language of the NCERT science textbooks is simple and easily comprehensible
- The given results indicated that 26% teachers strongly agreed, 48% agreed and 20% remain undecided. On the other side 2% disagreed and 4% strongly disagreed that NCERT science textbooks provide ample illustrations or diagrams for better understanding of concepts.
- The findings revealed that NCERT science textbooks have a proper ratio of information/knowledge content as most of the teachers i.e. 16% strongly agreed, 52% agreed and 22% were undecided whereas 4% disagreed and 2% strongly disagreed with respect to the said ratio of content.
- The above findings suggested that NCERT science textbooks provide enough activities that encourage the students to use critical thinking skills. The result stated that majority of teachers hold affirmative view regarding the statement i.e. 14% strongly agreed, 40% agreed and 32% remain undecided. On the other hand 12% disagreed with the same.
- The responses made by teachers showed that a majority of teachers i.e. 16% teachers strongly agreed, 40% agreed and 30% teachers remain undecided while 10% disagreed and 2% strongly disagreed that NCERT science textbooks use appropriate scientific terminology to facilitate student understanding.
- The results indicated that 22% teachers strongly agreed, 36% agreed and 26% are undecided while 12% teachers disagreed that NCERT science textbooks at upper primary stage cover science, technology and society (STS) issues.
- The results indicated that most of the teachers i.e. 40% strongly agreed, 68% agreed and 22% remain undecided while 12% disagreed and 2% strongly disagreed that NCERT science textbooks reinforce the common misconceptions related to concepts thereby justifying the statement.
- The results indicated that 22% teachers strongly agreed, 28% teachers agreed and 32% remain undecided whereas 18% disagreed that though the NCERT science textbooks to some extent fulfills the criteria of above statement yet there needs some changes to be made in these textbooks so that the above made statement gets justified that the NCERT science textbooks contain a good mix of application-based questions.
- The results obtained indicated that 16% teachers strongly agreed, 36% agreed and 30% were undecided and 18% disagreed that NCERT science textbooks cover every domain i.e. cognitive, psychomotor and affective domain with respect to educational objectives.
- The responses made by teachers indicated that 30% teachers strongly agreed, 58% agreed and 10% were undecided whereas 2% disagreed and again 2% strongly disagree that NCERT science textbooks sensitize students towards the environment.
- The results indicated that 20% teachers strongly agreed, 40% agreed and 34% remain undecided while 6% disagreed and 2% strongly disagreed that NCERT science textbooks help the learners with its activities to become the workers or doers in science and the teacher to become the facilitator.
- The results obtained indicated that majority of teachers i.e. 26% strongly agreed, 54% agreed and 24% were undecided whereas 2% disagreed that the examples provided in the NCERT science textbooks are relevant to daily life.
- The results indicated that most of the teachers i.e. 42% strongly agreed, 36% agreed and 18% were undecided. On the contrary 8% disagreed that the difficulty level of the NCERT textbooks is suitable for the learners.
- The results indicated that 12% teachers strongly agree, 44% agree and 32% remain undecided whereas 12% disagree that NCERT science textbooks provide adequate materials for learning opportunities to the students.
- The responses made by teachers indicated that a majority of teachers i.e. 90% strongly agreed, 80% agreed and 18% were undecided whereas 6% teachers disagreed and 1% strongly disagreed that NCERT science textbooks are not a sufficient repository of knowledge and therefore the required changes need to be made.
- The results indicated that most of the teachers i.e. 26% strongly agreed, 44% agreed and 16% teachers were undecided while 4% strongly disagreed that NCERT science textbooks provide an excessive amount of recall/knowledge type of information and therefore necessary changes need to be incorporated.
- A majority of teachers i.e. 50% strongly agreed, 36% agreed and 14% teachers were undecided while very few teachers i.e. 4% strongly disagreed with that NCERT science textbooks provide appropriate coverage of the areas specified in the NCF 2005.
- The above results depicted that very few teachers i.e. 20% teachers agreed and 18% teachers had a neutral stance whereas 22% teachers disagreed and 6% teachers strongly disagreed that the information contained in NCERT science textbooks does not need to be supplemented by reference books.
- The given results indicated that very few teachers i.e. 20% strongly agreed, 4% agreed and 14% teachers had undecided opinion while 26% teachers disagreed and 6% teachers strongly disagreed that NCERT science textbooks should deal with concepts in a balanced manner.
- The results indicated that 20% teachers strongly agreed, 40% agreed and 8% teachers remain undecided while 2% teachers were disagreed and 6% were strongly disagreed that NCERT science textbooks contain updated information about recent inventions and discoveries.

Educational Implications

- The way content in the chapters of the NCERT science textbooks is logically sequenced in the same manner other science textbooks should incorporate the same as it is the necessary requirement for a good textbook.
- It is quite necessary for a science textbook that the concepts are supported by suitable examples like the NCERT science textbooks.
- The way the various science concepts in the NCERT science textbooks proceed from simple to complex in the same way other Science textbooks should incorporate.
- A textbook must provide information on resources that could be used to enrich text materials as evident from the NCERT science textbooks.
- A textbook prescribed for upper primary level must provide activities that are congruent with the learning characteristics of upper primary students.
- A textbook should provide opportunity for hands-on activities (active learning) in the classroom as this reason holds majority of affirmative responses from science teachers for NCERT science textbooks.
- Textbook must provide co-operative learning activities in the classroom like NCERT science textbooks.
- The interactive way in which the team of Bujho and Paheli unfold the concepts gives a clear view that textbook should be written in a interesting and child-friendly way.
- Textbooks should cater to individual differences of learners as NCERT science textbooks does, so that learning becomes easier for every student.
- The language of the NCERT science textbooks being simple and easily comprehensible for the users entails that textbooks should be written by using simple and lucid language.
- Efforts need to be taken on the part of textbook writer and publisher to incorporate ample illustrations or diagrams for better concept clarity like NCERT science textbooks.
- Like NCERT science textbooks other textbooks should also have a proper ratio of information/knowledge content as this is the necessary requirement for facilitating users' learning.
- The text books for the Upper Primary classes therefore, require inclusion of both activities and abstract concepts and thought processes for development of high order thinking skills unlike the present NCERT science textbooks.
- The textbooks should provide enough activities that encourage the students to use critical thinking skills.
- The way in which NCERT science textbooks use appropriate scientific terminology to facilitate student understanding clearly entails that other science textbooks should be written by assimilating the same.
- In this ever-growing and ever-changing world textbooks must cover the science, technology and society (STS) issues as the NCERT science textbooks do.
- Unlike NCERT science textbooks, the textbooks should incorporate enough clarity and precision so that the common misconceptions are not reinforced knowingly or unknowingly.
- The textbooks must provide a good mix of application-based questions catering to the needs of users.
- As the way the NCERT science textbooks for Upper Primary stage stress for sensitizing students towards the environment, in the same way other textbooks must sensitize students towards environment and help them in attaining sustainable development.
- The science textbooks must create the opportunity for students with its activities to become the workers or doers in science and the teachers to become the facilitator so that the real aims of science education could be achieved.
- The examples provided in the textbooks help learners in meaning making thereby making it relevant to their daily life as is evident from the NCERT science textbooks. Therefore, it is highly recommended that textbooks must provide examples that are relevant to the daily life of learners.
- A science textbook should provide a holistic and coherent picture of the different dimensions of science to the users so that there no need for the supplementary information from any reference book.
- As in the NCERT science textbooks, the other science textbooks should also contain updated information about recent inventions and discoveries so that the users get abreast with the current happenings.

Conclusion

The present study tried to explore the perception of science teachers towards NCERT science textbooks and thus on the basis of results, educational implications have been drawn for the development of better textbooks that will ultimately facilitate students, teachers and the educational institutions. The findings pertaining to perception of teachers towards NCERT science textbooks entail that most of the teachers favor the fact that these textbooks are able to provide different aspects of scientific literacy to its users despite certain limitations. Also from the findings it is evident that the NCERT science textbooks provide emphasis for the recall / information aspect of science therefore a more balanced approach with emphasis on both the content and investigative processes of science is needed to be incorporated in these textbooks. Incorporating necessary changes in these textbooks as being suggested in this study will definitely facilitate young learners of upper primary stage including all the users of these textbooks and also provide an exemplary foundation for textbook writers and publishers.

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