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# CAPACITY BUILDING IN TEACHERS TO TEACH GEOGRAPHY SCIENTIFICALLY

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## Abstract

Social studies are the subjects which prepare us for our day to day living. The subject of Geography encompasses a wide knowledge base. Geography is all about understanding and application rather than acquisition of non-functional knowledge. The knowledge of Geography helps to gain insights and to make better and more informed decisions. This is possible only if the critical thinking is applied while learning the subject. Developing critical thinking among students is a challenging task looking at the way these subjects are being taught in the schools. This research is an attempt to develop scientific approach to social studies through two methods i.e. Concept based teaching and Generalization based teaching.

## Introduction

The subject of Geography encompasses a wide knowledge base. Geographical knowledge is important to everyone and in every field- from agriculture to defence & intelligence and from media to real estate. Though it is of utmost importance for every one of us, the subject is not given its due respect. In an effort to study Geography by merely memorising all the facts about people and places the students often find it very difficult and boring to learn the subject matter. This results in disinterest in the subject and inability to think beyond the given context and practical application of the knowledge acquired.

Geography is all about understanding and application rather than acquisition of non-functional knowledge. The knowledge of Geography helps to gain insights and to make better and more informed decisions. This is possible only if the critical thinking is applied while learning the subject. If the students are being trained in critical thinking it will help expand and explore the world beyond textbooks. Critical thinking ability is the outcome of the scientific approach towards the subject. Scientific approach is based on gathering observable, empirical, measureable and verifiable evidences subject to specific principles of reasoning.

Scientific approach can be defined as 'body of techniques for investigating phenomena and acquiring new knowledge as well as correcting and integrating previous knowledge.'

In an attempt to make the Social-studies applicable in students' day-to-day life, a UGC sponsored major research project titled 'Capacity Building of Social Studies Teachers to Teach Social Studies Scientifically' was taken up by a team of three teacher educators who are experts in the subject area of History, Geography and Economics. The paper writer is the method master in Geography. The research team developed the instructional program to train in-service teachers to use two scientific methods viz. Concept Based Teaching (CBT) and Generalization Based Teaching (GBT) to teach Geography, History and Economics and studies its effectiveness.

**Concept based teaching:**

In the concept based teaching, teachers use concepts as a lens to focus on a topic. For example, instead of teaching facts about dinosaurs, they might focus on dinosaurs according to the concept of classification: Is it a dinosaur that runs or walks? That eats animals or plants? That fights or hides? Or they could focus on dinosaurs according to the concept of extinction--what it means to adapt or not to adapt to the world around it and what happens when a living thing isn't well-suited to its environment. This clarifies the meaning of the concept based teaching as follows:

**Definition:**

"It is a teaching learning situation where the concepts are at the focus and the content is taught in relation with these concepts."

"Concept-Based Teaching is a way of organizing lessons that stresses the concepts and big ideas that stand behind the topics discussed in class. Concept-Based Teaching answers the question, "Why do we have to learn this?"

**Characteristics:**

- Concepts are at the focus and content at its periphery.
- It is timeless. It can be applied in the real life situation.e.g. Culture. Understanding of this concept can result in the acceptance of different cultures.
- It leads to form the generalization by relating two or more concepts.

**Generalization Based teaching:**

Instruction based on generalizations is an effective way for students to genuinely understand topics, but more importantly, it is an effective way to teach students to think critically. Social Study subjects not being the pure science cannot provide the base for formulating conclusive generalizations like science. E.g. 'water is colourless' is a conclusive generalization. It can be very well confirmed through experimentation in the subject of Geography. But one cannot completely verify the assumptions made in history since it deals with human behaviour. However these generalizations help in developing the ability of decision making by identifying common elements from deferent events.

**Definition:**

"Generalization based teaching is the form of instruction where the focus is on the statement of the relationship between two or more concepts or terms to be verified with the help of the content as an example."

**Characteristics:**

- Focus of instruction on Generalizations.
- Content is presented as an example to prove or form generalizations.
- Through inquiry showing relationship between two or more concepts.

This research was conducted as a part of a major research project of two years of duration completely funded by UGC. The title of the project was "CAPACITY BUILDING IN TEACHERS TO TEACH SOCIAL STUDIES SCIENTIFICALLY"

**Review of related literature:**

For the present project the review of related articles and researches was done in order to get more insight into the topic under study.

**Gupta Rita. ;( 1989)**[10] aimed at investigating the development of Geographical concepts of children of different age groups with a purpose to construct improved Geographical Instructional Material. The study revealed that Boys were better than the girls from all the grades and higher grade students were found to have developed better concept understanding than lower grade students. The impact of Programmed learning material which was developed after the diagnostic test was found to be effective in getting better performance from the sample.

**Shahi G.; (1989)** [11] developed Inductive and Deductive programmes in Geography and assessed the relationship between achievements of control group and two experimental groups- one for Inductive method and other for Deductive method of teaching Physical Geography through the criterion and retention tests and thereby computing the data obtained through 't' test. The findings revealed that the three groups differed significantly with regards to immediate achievement. Both the experimental groups performed better than the control group.

The review of related literature throws light on the following points:

Strategies can contribute in making abstract learning more concrete. These strategies prove to be effective means in developing positive attitude towards the subject. The researcher intended to use the scientific methods in order to develop critical thinking ability in students. The strategies that were planned for the same would make it easier to achieve this purpose.

Most of the studies conducted on concept teaching are mostly from other countries. It implies that not much awareness is seen in the researchers in India to develop and try out scientific methods like concept based and generalization based teaching for Geography subject. The present study is an attempt to fill this gap and prove the effectiveness of these methods in developing higher order thinking in learners. Secondly, the review also threw light on the need for enhancing teachers' capacity in the enhancing the quality of teaching Social Study subjects. This can be achieved if they are treated scientifically for providing ample scope to the learners for rational and critical thinking and also for increasing applicability of these subjects by developing their decision making abilities.

**Significance of the study**

The objectives like developing scientific attitude, rational thinking, decision making, and divergent thinking can be taken care of through social studies. Social Study text books include abundance of concepts which if taught scientifically, the learning of facts can become very easy for the students. These concepts are repeated in many topics at different geographical regions with the common attributes found between them. Proper understanding of the concepts can help students to weave these events in one thread thus leading to self learning.

Similarly, these concepts can be related to form the generalization which the students can explore or experiment on the basis of the facts. This can enable them to make the gained knowledge applicable in their day-to-day life situation which would include the common attributes that they have learnt through Social study subjects.

Society today is experiencing an increasing awareness about the qualitative and functional outcome of Education. The teacher has to play the pivotal role in realizing this expectation of the society. This is possible only when the teaching-learning process is focused on the student's meaningful learning rather than mere transmission of the factual knowledge. Major role of teachers in teaching is **'to create powerful learners.'** Such treatment demands the overhauling of the techniques and the methodology. If these teachers are trained in the application of these methods that would result in getting Social Study subjects their due status in the curriculum as well as in the minds of learners.

**Objectives of the study**

**Major objectives of the said project were:**

1) To train the school teachers from Urban and Rural areas to develop Instructional package in Social Study subjects using following scientific methods:

i) Concept Based teaching method (CBT)

ii) Generalization Based teaching method (GBT)

2) To study the impact of the training on capacity building of the teachers

**Hypotheses**

1. There is no significant difference in the achievement level of the students from schools in Mumbai as reflected in their pre-test and post-test scores in Geography.

2. There is no significant difference in the achievement level of the students from schools in Nandurbar as reflected in their pre-test and post-test scores in Geography.

3. There is no significant difference in the achievement levels of the students from schools in Mumbai and Nandurbar as reflected in their post-test scores in Geography.

**Methodology of the study**

Single group pre test, post test experimental design of research was used in both rural and urban area to study the impact of training program developed for the teachers. The capacity building of teachers was studied through the achievement level of students taught by these participant teachers.

**Sample**

The population comprised of in-service teachers and students from schools in Mumbai and Nandurbar district. 17 in service teachers teaching Geography (8 from Mumbai and 9 from Nandurbar) and 540 students (142 from Mumbai and 398 from Nandurbar) were selected for the study.

**Tools and techniques for data collection:**

1. How I teach? Form to understand the usual teaching style of the teachers. KWLH form to keep track of their progress throughout the training program.

2. Sample lesson plans.

3. Pre test comprising factual questions and reasoning.

4. Training program to orient the teachers to two scientific methods under consideration (2 days- 10 hrs) and orientation to evaluation techniques for these two methods (1 day- 5 hrs.) All the tools were prepared by the team of researchers.

5. Post test comprising items demanding application on part of the students.

**Procedure**

A pre-test was prepared in the subject of Geography with the objective of testing student's understanding about applicability of a particular topic. The pre-test was administered by the subject teachers before attending the training workshop. The training programme carried out for the participants. There were two workshops organised for training purpose. First workshop was conducted to train the teachers to teach Geography using two scientific methods i. e. Concept Based Teaching (CBT) and Generalisation Based Teaching (GBT). Participant teachers prepared the lesson plans following these scientific methods under the guidance of the subject experts. These lesson plans were implemented in their respective schools.

The second workshop was conducted to train the teachers for the preparation of the test to evaluate students' understanding about the applicability of the topic taught by using CBT and GBT. The participants have prepared the test based on the topic which they have taught using CBT and GBT method. These tests were administered and data thus collected was analysed.The same procedure was followed for the second phase of the project in Nandurbar district.

**Scope and limitation**

The study is limited to 17 teachers teaching Geography and 540 students in various schools in Mumbai and Nandurbar district affiliated to SSC, CBSE and ICSE boards.

**Analysis and Interpretation of data**

The capacity building of these teachers was found out quantitatively and qualitatively. The pre-test and post-test scores of the achievement tests were analysed by using descriptive(Mean) and inferential (t-test) statistical measures. Pooled 't' was calculated since sample size differed in different schools.

Null hypotheses were tested by using these statistical measures as discussed below:

**Hypothesis 1: There is no significant difference in the achievement level of the students from schools in Mumbai as reflected in their pre-test and post-test scores in Geography.**

**Table 1: The 't' value calculated from pre-test and post-test scores of students of schools from Mumbai- Phase I**

| Groups | Sample (N) | Mean | Standard Deviation | 't' value | Level of Significance d.f. 282=2.59 |
|---|---|---|---|---|---|
| Pre-test Scores | 142 | 6.72 | 3.16 | 4.08 | Significant at 0.01 level |
| Post-test Scores | 142 | 9.03 | 5.99 | | |

As reflected in the table 1 the 't' value is significant at 0.01 level of significance. The null hypothesis is rejected which means that the scores are in favour of post test further confirming the effectiveness of the training programme for the capacity building of the teachers in urban area i.e. Mumbai.

**Hypothesis 2: There is no significant difference in the achievement level of the students from schools in Nandurbar as reflected in their pre-test and post-test scores in Geography.**

**Table 2: The 't' value calculated from pre-test and post-test scores of students of schools from Nandurbar - Phase II**

| Groups | Sample (N) | Mean | Standard Deviation | 't' value | Level of Significance d.f. 794=2.58 |
|---|---|---|---|---|---|
| Pre-test Scores | 398 | 9.01 | 6.11 | 7.8 | Significant at 0.01 level |
| Post-test Scores | 398 | 13.83 | 10.71 | | |

**Interpretation**

The 't' value is significant at 0.01 level of significance. This means that the null hypothesis is rejected and there is significant difference in the pre test and post test scores of the students in Nandurbar. The post test scores are higher as compared to pre test scores which suggests that the capacity building was successful among teachers from rural area who underwent the training and taught the subject using scientific methods.

**Comparison between the data obtained from post-tests of urban and rural areas (Phase I and phase II).**

**Hypothesis 3: There is no significant difference in the achievement levels of the students from schools in Mumbai and Nandurbar as reflected in their post-test scores in Geography.**

**Table 3: The 't' value calculated from the post-test pooled means of the scores of students of schools from Mumbai and Nandurbar**

| Groups | Sample (N) | Mean | Standard Deviation | 't' value | Level of Significance d.f. 538=2.59 |
|---|---|---|---|---|---|
| Mumbai Pre-test Scores | 142 | 9.03 | 5.99 | 4.77 | Significant at 0.01 level |
| Nandurbar Post-test Scores | 398 | 13.83 | 10.71 | | |

**Interpretation**

The 't' value of the post-test means for urban and rural area is significant at 0.01 level. Therefore the null hypothesis is rejected which confirms the better capacity building of school teachers from rural area than their counterparts in urban area.

Hypothesis 1 and 2 both are rejected implying that there is significant difference in the pre-test and post-test means of the scores of the students from both urban as well as rural areas in favour of post-test means it is clear that the impact of the training programme in both the areas is very good on the participant teachers in terms of their capacity building, but teachers from rural areas have performed better as compared to their counterparts from urban area.

**Conclusion:**

The data analysis clearly indicates the successful accomplishment of the training programme to introduce and equip teachers from rural as well as urban areas with the two

innovative methods which follow scientific approach to make Geography learning more meaningful and functional. These finding on the achievement levels of the students taught through conventional as well as scientific methods are directing towards the impact of training since it reflects on the capacity building of these teachers.

The effectiveness is more in case of second phase in rural area i.e. Nandurbar. The feedback from the participants explains the reasons for this better performance as follows:

- The teachers from rural areas face various restrictions to explore new methods and techniques.
- They are less exposed to newer technologies and face the problem of digital divide.
- Consequently they tend to be more motivated and interested to grab the opportunities coming on their way to learn and update their knowledge.

The capacity building of the teachers was also found out qualitatively by analysing their feedback at the end of the training programme. The participants appreciated the quality and organization of the whole training program. They also appreciated the new knowledge gained in terms of two new methods which will help them teach social studies scientifically and interestingly. They expressed the need to conduct such workshops for all the social studies teachers in all the schools. The project ended on a positive note with an encouraging feedback.

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