CHAPTER 3

METHODOLOGY OF RESEARCH
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CHAPTER 3

METHODOLOGY OF RESEARCH

3.0 Introduction

Research exerts a significant influence over educational systems. It is a formal, logical, methodological and rigorous process aimed at discovering new knowledge and finding out possible solutions to the problems. Research is a studious inquiry or examination, especially a critical or exhaustive investigation or experimentation having for its aim the discovery of new facts and their correct interpretation, the revision of accepted conclusions, theories or laws in the light of newly discovered facts or the practical application of such conclusions, theories or laws.(Young-1975)

3.1 Type of Research

As the purpose of the present study is to assess the inclusive practices and to ascertain effectiveness of a knowledge based program, it is applied research. Applied research emphasizes on structures and processes as they appear in educational practices to develop knowledge, which has direct utility to practitioners (teachers and administrators) (Pandya-Educational Research, p-17).

Applied research has a direct impact on educational practices and procedures. The present research focuses on the practical solution to a problem with the help of principles of social constructivism, collaborative learning, different learning styles, assistive technologies etc. A Knowledge Based Program in inclusive education (KBPIE) planned, developed and applied on a sample of school teachers to test the effectiveness. The main areas of program in which the above principles and theories were applied are; Hearing Impaired, Visually Impaired, Learning Disabilities, Orthopedically Impaired, Mentally Challenged, and Gifted.

3.2 Method of Research

In the present research, researcher has explored the facts and learned the phenomenon from as many perspectives as possible. The researcher also tried to
establish generalizations applicable beyond the boundaries of research settings. Thus it made use of two paradigm of research, Qualitative and quantitative.

In the present research;

1-Complete survey was conducted using observations, interviews, and questionnaires, to collect rich and adequate information. Existing practices were studied in depth.
2- Knowledge Based Program in inclusive education (KBPIE) about the specific areas of different abilities given above has been developed for the school teachers.
3- Effectiveness of the program was tested by experimental method.

![Multi-method Research](image)

**Figure 6-Multi-method Research**

### 3.3 Population

All the schools in urban and rural Pune were the population for studying Inclusive Practices. All the school teachers from urban and rural schools in Pune were the population for assessing attitudes and knowledge of school teachers about Inclusive Education. All the teachers teaching at higher primary level was the population for A Knowledge Based Program in inclusive education (KBPIE).
3.4 Sample: Sample comprises of a small proportion of individuals, items or events selected for a study from a larger group referred to as a population. Sampling is the process of selecting a number of participants for a study in such a way that they represent the larger group from which they are selected.

Table 12 – Sample selected

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Sample</th>
<th>Size of sample</th>
<th>Objective</th>
<th>Method of sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Urban and rural Schools</td>
<td>40</td>
<td>1-To assess the physical and human resources in urban and rural schools in Pune.</td>
<td>Random</td>
</tr>
<tr>
<td>2</td>
<td>Principals</td>
<td>40</td>
<td>1-To assess the physical and human resources in urban and rural schools in Pune.</td>
<td>Random</td>
</tr>
<tr>
<td>3</td>
<td>School teachers</td>
<td>500</td>
<td>1-To assess the physical and human resources in urban and rural schools in Pune.</td>
<td>Random</td>
</tr>
<tr>
<td>4</td>
<td>School teachers teaching for higher primary students</td>
<td>80</td>
<td>3-Development, Implementation and testing the effectiveness of Knowledge Based Program in inclusive education (KBPIE)</td>
<td>Purposive</td>
</tr>
</tbody>
</table>

3.5 Tools and Techniques of Research

Data collection tools are nothing but data-gathering devices that serve the researcher in the acquisition of data. These tools employ distinctive ways of describing and quantifying the data and each is appropriate and relevant in a given situation depending upon the type of data to be gathered and processed. At times, instead of using concrete tools, collection of data may take place via the help of certain processes (such as observation, interview, social scaling, Q methodology and examination of material). These processes are known as techniques.
3.5.1 Tools and Techniques used for collection of data

After careful study about the tools and techniques, suitability, and appropriateness, researcher selected suitable tools for collection of data.

Tools are selected according to the nature of information required and the subjects used for collection.

![Figure: 7 - Tools and Techniques](image)

In all the Research tools and techniques used in the present research are:

1. Observation in schools by the researcher using a Likert scale.
2. Semi-structured interview of the principals of various schools about Inclusive practices in their schools.
3. Attitude scale measuring teachers’ attitude towards Inclusive Education.
4- Knowledge and acceptance test on Inclusive Education for teachers in Urban and rural schools.

5- Pretest and posttest in a time series,
   Test-1 (O₁)
   Pretest-1 (O₂)
   Posttest-1(O₃)
   Posttest-2(O₄)

3.5.2 Tools used for statistical interpretation

The data collected was analyzed using descriptive and inferential statistical tools.

1- Qualitative Analysis
2- Percentage
3- Mean
4- Standard deviation
5- T-test

3.6 Methodology and Procedure of Research for Objective 1 and 2

Objective 1- To assess the Physical and Human Resources in urban and rural schools in Pune with respect to--

   i. Modification in infrastructure for inclusion of differently abled students.
   ii. Material essential for inclusion of differently abled students.
   iii. Technological support required for inclusion of differently abled students.
   iv. Availability of Human Resources for inclusion of differently abled students.
   v. Knowledge, Acceptance and attitude of teachers in urban and rural schools in Pune with respect to inclusion of differently abled students.

Objective 2 - To compare the Physical and Human Resources in urban and rural schools in Pune with respect to inclusion of differently abled students.
The research questions for the above objectives are:

For objective 1

i. Are the physical resources in school catering for inclusion of differently abled students?

ii. What sort of technological support is available in the school for inclusion of differently abled students?

iii. How adequate are the available learning and teaching materials in the school for inclusion of differently abled students?

iv. What sort of human resources are available in the schools to cater to the needs of differently abled students?

v. What is the current status of training of the school teachers with respect to inclusion of differently abled students?

vi. What are the knowledge levels of school teachers about inclusion of differently abled students?

vii. What is the attitude of teachers regarding inclusion of differently abled students?

3.6.1 Method of Research

Survey – Surveys in Education are usually concerned with collecting information about school facilities, practices, problems, students, teachers or instructions. Survey data are usually collected using interviews, questionnaires and observations. Existing inclusive practices and the barriers faced by teachers and administrators in implementation were assessed by survey.

3.6.2 Tools and techniques used for Survey

3.6.2.1- Observations

Observation was done by the researcher using a Likert 5 point scale about the following main aspects regarding Inclusive Practices.

- Infrastructural resources for successful Inclusion of differently abled students
- Material essential for successful Inclusion of differently abled students
• Technological support required for successful Inclusion of differently abled students
• Human Resources

Observation scale first version was prepared. Validation of the scale was done by the experts. Necessary changes are made and final version has been prepared. Observations were carried out using the above scale in selected schools.

3.6.2.2- Interview

Interview is a widely used tool to assess people’s experiences, opinions, perceptions, attitudes etc. A Semi-structured interview was used as one of the tool of present survey. A set of questions was constructed to identify the current inclusive practices and to find out the barriers. Construction of the semi-structured interview involves:

• Reviewing the literature
• Construction of the first set of interview questions
• Validation by experts
• Pilot testing
• Developing the final set of interview questions

3.6.2.2.1 Construction of the first set of interview questions

Semi-structured interviews include partly open-ended and partly closed questions. It allows for focused, conversational, two way communication. A set of questions was prepared related to the topic with freedom of addition of few questions related to the topic at the time of interview depending upon the conversation. A review regarding the important aspects of the topic has been carried out first, which provides the basis for formulation of questions. All the aspects were taken into consideration. Discussions were carried out with experts and the nature of questions was decided.
Questions were constructed by taking into consideration the following aspects:

- Concept of Inclusion
- Infrastructural and other Facilities with respect to inclusion of differently abled students
- Human Resources with respect to inclusion of differently abled students
- Curriculum
- Overall opinion about Inclusion of differently abled students.

The first set of questions for interview was thus developed consisting the above five aspects to be assessed.

**3.6.2.2.2 Validation of the set of questions:**

Pre-pilot study has been carried out to ascertain the validity of the tool. The tool was given to experts in the respective field. The experts were selected from the following fields; a) Resource persons for Inclusive Education associated with various educational institutions b) Teacher Educators who are concerned with the topic. c) Educators from DIET. (District Institute of Education and Training)

The experts were selected, their acceptance was confirmed and the set of questions was given to them for study. Experts checked the set, for relevance of questions, sequencing, appropriateness, comprehensiveness, language used. Based on the suggestions made by the experts, the necessary changes were made in the questions, and set of question was finalized. The changes were regarding sequencing and, language used.

**3.6.2.2.3 Final set of interview Questions:**

The final set of questions to be given for the Principals of the selected schools consists of five main aspects of Inclusive Practices and 20 questions.

- Concept of Inclusion ----------- -3 questions
- Infrastructural Facilities------- -5 questions
- Human Resources--------------- 6 questions
- Curriculum--------------------- 2 questions
- Overall opinion--------------- 4 questions
Above framework was supported by more open ended questions promoting flexibility of the responses to obtain qualitative information.

3.6.2.2.4 Population

Interview was one of the tools used to collect the data related to objective 1, 2 and 3. The population for this was all the principals of schools in Urban and rural Pune.

3.6.2.2.5 Sample

A sample of 40 principals was selected to assess the existing inclusive practices and to identify the barriers in implementing Inclusive Education. The method of sampling was random sampling. It was selected on the lottery basis.

3.6.2.2.6 Data Collection

The interview sessions were conducted as per the convenience of researcher and principals. It was followed by a telephonic conversation wherever necessary. The sessions were conducted in comfortable, informal environment.

3.6.2.2.7 Data Analysis

The responses were categorized and a quantitative analysis by percentage as a tool and qualitative analysis by analyzing the responses were done.

3.6.2.3 Questionnaire

A questionnaire is a research instrument consisting of a series of questions and other prompts asked to individuals to obtain statistically useful information about a given topic. It provides a standardized data gathering procedure. A questionnaire was developed to identify the following aspects from school teachers.

- Knowledge about Inclusive Education
- Availability of resources
- Barriers in implementing Inclusive Education
- Experiences of Inclusive Practices
- Adequacy of training regarding inclusion of differently abled students

Questionnaire developed consists of Demographic questions, contingency questions and multiple choice questions based on the above aspects of Inclusive Practices.

The questionnaire was divided into four main parts, they are:
- Previous training about Inclusion of differently abled students in the general classroom.
- Knowledge about Inclusion.
- Acceptance of the concept of Inclusive Education.
- Personal opinions about Inclusive Education.

### 3.6.2.3.1 Constructing first version of the questionnaire

Taking into consideration, the operational definitions of concepts and objectives, the test items were constructed. Questions were constructed for all the four parts as:

1. Questions based on previous training were constructed. Questions constructed are close ended with few items with flexibility of responses.
2. Questions based on Knowledge about Inclusion were multiple choice questions following recognition of the facts. The literature review has been done on various aspects of Inclusion of students with different abilities, discussions with experts has been carried out. It was followed by finalization of the aspects of knowledge test.

#### Table 13- Areas of Information about Inclusive Education

<table>
<thead>
<tr>
<th>No</th>
<th>Areas of Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Historical perspective of Inclusive Education</td>
</tr>
<tr>
<td>b</td>
<td>Special Education</td>
</tr>
<tr>
<td>c</td>
<td>Ten reasons for Inclusive Education</td>
</tr>
<tr>
<td>d</td>
<td>Framework for Inclusive Education</td>
</tr>
<tr>
<td>e</td>
<td>Salamanca Statement</td>
</tr>
<tr>
<td>f</td>
<td>Various approaches to successful inclusion</td>
</tr>
<tr>
<td>g</td>
<td>Requirements of Inclusive Education</td>
</tr>
<tr>
<td>h</td>
<td>Current scenario of Inclusive Education</td>
</tr>
<tr>
<td>i</td>
<td>Role of school teachers in Inclusive Education</td>
</tr>
</tbody>
</table>
3- Questions based on acceptance of Inclusive Education consist of a series of close ended questions along with few open ended questions regarding views of school teachers about Inclusive Education.

4- Part four of the questionnaire was based on school teacher’s personal opinion about Inclusion of the students in the regular classrooms. It comprises of close ended questions.

Questions in the questionnaire were prepared by following certain guidelines of construction of questions. (Ross-1996). The guidelines are:

- Simplicity of language
- Keeping the questions short
- Following difficulty order
- Formulation of questions to obtain exact answers.
- Organizing the pattern of questions.

The first questionnaire was thus developed with four parts.

**Table 14 - Four parts of questionnaire**

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Description</th>
<th>No. of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Part 1-Previous training about Inclusion</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Part 2-Knowledge about Inclusion</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>Part 3-Acceptance of the concept of Inclusive Education.</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Part 4-Personal opinions about Inclusive Education.</td>
<td>10</td>
</tr>
</tbody>
</table>

**3.6.2.3.2 Conducting a Pre-pilot Study**

Pre-pilot study involves two steps;

1) **Ascertaining the validity of the questionnaire**: - The questionnaire prepared was given to the experts in the concerned field. The experts were from the field of psychology and Special Education. Senior teacher educators and Principals of schools were also chosen as experts. Opinions of the experts were sought to
determine the content and face validity of the questionnaire. Questions that require change were modified, sequence was finalized.

2) **Conducting an Item Analysis**: - The questionnaire prepared was given to 200 school teachers for examining class wide performance of individual items. Item discrimination type was used for item analysis. Discrimination index is the basic measure of the validity of an item.

Method used to find out discriminative index is as follows;

- Total scores were arranged in a descending order.
- Upper 27% and lower 27% of scores were selected (Ebel and Frisbie-1991.p.227).
- Discrimination index was calculated for each item from knowledge test questionnaire, by the formula
  \[ \text{Discrimination Index} = \frac{\text{R}_{H} - \text{R}_{L}}{N} \]
- The same procedure was followed for calculating Discrimination Index of each item separately.

Question no.2, 5, 10, and 15 from the first version of questionnaire were having discrimination index between 0.15 to 0.20 (0.16, 0.15, 0.18, 0.20). These questions were improved.

3.6.2.3.3 **Conducting a pilot study**

A pilot study was conducted on 10 school teachers. Questionnaire was administered to them to assess inclusive practices in schools. The objective was to check the problems regarding time, clarity of questions, instructions etc. The responses given were studied and few modifications were made. Final form of the questionnaire was thus prepared, for assessing Inclusive Practices and Knowledge of school teachers about Inclusion.

3.6.2.3.4 **Final form of the questionnaire**

Questionnaire consisting of 60 questions divided in four parts with yes/no, multiple choice, and some questions regarding opinion of school teachers about inclusion were given was finalized. A separate sheet about the necessary information of the school teachers was enclosed and questionnaire has been made ready for distribution to the sample selected. Questionnaire developed above was
translated in Marathi with the help of experts in Marathi language. It was again re-
translated in English for verification.

3.6.2.3.5 Population

According to the objectives, all teachers working in urban and rural schools in Pune constitute population of the following part of the research.

3.6.2.3.6 Sample

Sampling technique used was random sampling. A sample of 500 school teachers from Urban and rural schools in Pune was selected to assess Inclusive Practices in schools and to test their knowledge about Inclusion of the Students with different abilities in general classrooms. The criteria for selection are;

1- Population size was decided according to table given by Israel-2008 for descriptive research. (400 for population size > 100,000). Thus 500 teachers were selected as a sample.
2- 250 teachers from Rural and 250 Teachers from Urban schools were selected.
3- The teachers are selected on a random basis. Lottery method of selection was used for school selection, and teachers were selected on random basis of the same school.

3.6.2.3.7 Data Collection

The rapport was established with the school teachers through a short session and the questionnaire developed was distributed to the sample of 500 school teachers from urban and rural schools in Pune district listed in appendix- with all the necessary information given by the researcher about Inclusive Practices. The distribution was carried out during the year 2009-2010.

3.6.2.3.8 Tools used for analysis of data

Tools used for analysis of data collected from the questionnaire were; percentage, standard deviation, and t-test.

3.6.2.4 Attitude Scale

Tool used was a standardized Attitude Scale, Keith Cochran scale (STATIC: Scale of Teacher’s Attitudes towards Inclusive Classrooms). It was Likert 5 point scale as
Table 15 Attitude Scale

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

3.6.2.4.1 Method of Research

Survey method was used for assessing the attitudes of school teachers about Inclusive Education.

3.6.2.4.2 Population

All the teachers working in Urban and rural schools in Pune constitute population of the following part of the research.

3.6.2.4.3 Data Collection

Attitude Scale was distributed along with the knowledge and acceptance test to 500 school teachers of different schools listed in Appendix- during the year 2009-2010. The orientation session followed by immediate distribution of Attitude Scale was carried out.

3.6.2.4.4 Tools used for analysis of data

Percentage of different responses to different questions was found out for descriptive interpretations.

3.7 Methodology and Procedure of Research for objective 3

Objective 3- To develop and to test the effectiveness of A Knowledge Based Program in Inclusive Education (KBPIE) for school teachers.

3.7.1 Methodology of Research--- Development of A Knowledge Based Program in Inclusive Education (KBPIE)

Method of research is product development research. A Knowledge Based Program in Inclusive Education (KBPIE) was developed for School teacher teaching at higher primary level. Responses obtained from various tools of survey regarding Inclusive Practices in schools were analyzed in a qualitative and quantitative manner. Inferences were drawn. According to the objective 3 of present research, program in Inclusive Education was developed.

Program planned was knowledge and application based program that could give all the necessary information regarding the concerned different ability in student. It also provides the ways and means to deal with the differently abled students. A
program thus developed was based on self-instructional design model. Instructional design models provide for a systematic approach of implementing the instructional design process for a specific educational initiative (Morrison, Ross, and Kemp, 2004).

3.7.2 Developing a Knowledge Based Program in Inclusive Education (KBPIE)

A careful review was done regarding various models of instructional design. The model that was suitable for developing a program was studied thoroughly. The model selected for designing instructions was Kemp’s Model of Instructional Design. The Kemp (1994) design model takes a holistic approach to instructional design. Virtually all factors in the learning environment are taken into consideration including subject analysis, learner characteristics, learning objectives, teaching activities, resources (computers, books, etc.), support services and evaluation. The process is iterative and the design is subject to constant revision. The immediate feel of being inclusive and particularly the fact that the central focus is the learner needs and goals are the strengths of this model.

Steps of development of a program in Inclusive Education for teachers teaching for Higher Primary.

3.7.2.1 Initial Scoping:

Based on the results of data collected, scope of the program is being finalized. Objective of the research is, to develop A Knowledge Based Program in Inclusive Education (KBPIE) for school teachers. The purpose is to enrich the school teachers about the concept of Inclusive Education, characteristic of students with different abilities, how to identify differently abled students, and the remedial measures to be taken for successful Inclusion of differently abled students.

3.7.2.2 Detailed Scoping:

Based on the objective, content of the program is planned. Planning for the treatment to be given is done. Detailed survey is done for the purpose of selecting the suitable instructional design.
3.7.2. 3- Developing an outline for instructional design:

Various instructional design models have been studied in detail and the design most suitable and effective for developing a program is selected. Kemps Instructional Design Model is selected.

3.7.2. 4- The Kemp Instructional Design Model

The Kemp Design Model consists of 9 steps:

1. Identify instructional problems, and specify goals for designing an instructional program.
2. Examine learner characteristics that should receive attention during planning.
3. Identify subject content, and analyze task components related to stated goals and purposes.
4. State instructional objectives for the learner.
5. Sequence content within each instructional unit for logical learning.
6. Design instructional strategies so that each learner can master the objectives.
7. Plan the instructional message and delivery.
8. Develop evaluation instruments to assess objectives.
9. Select resources to support instruction and learning activities.

Knowledge Based Program in Inclusive Education (KBPIE) was prepared by following the nine steps given as per Kemp’s model.

3.7.2.5- Identification of instructional problems, and specification of goals for designing an instructional program.

1- To assess the knowledge level about inclusive education of school teachers.
2- To test the knowledge of teachers about the following;

- History of inclusive education
- Need and importance of inclusive education
- Knowledge of different abilities in the students.
- How to deal with differently abled students.
3- To develop and test the effectiveness of the program in Inclusive Education for the teachers.

3.7.2.6- Examination of learner characteristics that should receive attention during Planning

Since the program is to be implemented on the school teachers, the characteristics are examined considering the following aspects:

- Knowledge about inclusion
- Attitude towards Inclusion
- Acceptance of the differently abled students in general schools
- Readiness to adapt the skills and techniques to be required to deal with differently abled students.
3.7.2.7 Identification of subject content, and analysis of task components related to stated goals and purposes.

Detailed survey was done for identifying the current practices in schools. Barriers were also identified. Lack of trained personnel has consistently been one of the many obstacles to the provision of services to children with disabilities in India. Out of the various problems in implementing Inclusive Practices in schools the most important factor is teacher’s attitude, and Knowledge about various different abilities in student and how to deal with these different abilities. The data collected from the tools selected, (Observations, Principals Interviews, Knowledge and Acceptance test on Inclusive Education, Pretest-O₁ and Pretest-O₂,) was analyzed to identify the content to be included in the program.

**Discussions with Experts** – The experts were selected from the field of Psychology, Special Education and Inclusive Education to obtain feedback regarding the present situation about teacher’s training about Inclusive Education (list enclosed in the appendix.). Expert’s opinion was that the general teachers should at least know about various different abilities, their identification, and remedial measures, so that they can help differently abled students in achieving in academics as well as adjusting with all the students. Teachers with knowledge and awareness about the disability and empathetic in nature would definitely be helpful for Inclusion.
Study of existing training programs

Table 16- Programs Studied

<table>
<thead>
<tr>
<th>No</th>
<th>PROGRAM</th>
<th>IMPORTANT FEATURES</th>
<th>DURATION</th>
<th>THEORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sir Shapurji Billimoria Foundation, Mumbai, Maharashtra</td>
<td>Knowledge of diversities in children, developing a new pedagogy, developing resource centers in schools, teaches in multiple settings.</td>
<td>three-week training courses for in-service teachers</td>
<td>Collaborative Learning, Participatory learning</td>
</tr>
<tr>
<td>2</td>
<td>Joyful Inclusion Pack, CBR Network, Bangalore, Karnataka</td>
<td>curriculum-based criterion-referenced checklist, Skills training in developing activity cards for children. Training in evaluating the baseline learning level of children, training in developing the individual education plan</td>
<td>General teachers in 30 rural government schools in Karnataka for 10 days.</td>
<td>Experiential learning, Project based learning</td>
</tr>
<tr>
<td>3</td>
<td>Sri Ramakrishna Mission Vidyalaya and IHRDC, Coimbatore, Tamil Nadu</td>
<td></td>
<td></td>
<td>Home-based learning, cooperative learning</td>
</tr>
<tr>
<td>Program in Inclusive Education developed by SCERT, Pune.</td>
<td>Information in short about diversities, Medical reasons and remedies,</td>
<td>Cooperative learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
<td>---------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program by Ankur Vidya Mandir, Pune</td>
<td>During vacations</td>
<td>Cooperative and collaborative learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program running in Aman Setu School</td>
<td>During vacations</td>
<td>Based on constructivism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paraeducator Taining material to facilitate Inclusive Education. Michael F. Giangreco, Linda Backus, Eileen CichoskiKelly, Priscilla Sherman &amp; Yannis Mavropoulos, Center on Disability and Community Inclusion University of Vermont</td>
<td>School-based staff development as well as training programs for prospective special and general education teachers. Collaborative Teamwork, (2) Inclusive Education, (3) Families and Cultural Sensitivity, (4) Characteristics of Children and Youth with Various Disabilities, (5) Roles and Responsibilities of paraeducators and Other Team Members, (6) Paraeducators Implementing</td>
<td>20 sections</td>
<td>Collaborative framework</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>PROGRAM</td>
<td>IMPORTANT FEATURES</td>
<td>DURATION</td>
<td>THEORY</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------</td>
<td>---------------------------------------------</td>
<td>----------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>8</td>
<td>An Inclusive Teacher Preparation Model Source: Whitworth, 1999</td>
<td>Pre service teacher preparation</td>
<td></td>
<td>Collaborative teaching-learning</td>
</tr>
</tbody>
</table>

**Task Components**

**Relevance-**

- Promoting use of innovative methods of teaching-learning.
- Motivate teachers to respect diversity in the classroom

**Aims-**

- To train teachers equipping them with knowledge on Inclusive Education for primary and secondary education;
- To provide teachers with ideas and knowledge of inclusive policies and practice.
- To equip the teachers with methods and techniques of teaching-learning to the differently abled students

**Content-**

Information about various different abilities with special interest in the abilities decided that are; Mentally challenged, Orthopedically Impaired, Visually Impaired Hearing Impaired, Giftedness, Learning Disabilities- a) Dyslexia, b) Dyscalculia, c) Dysgraphia d) ADHD.
Implementation— Framework of the program is developed, and implementation plans and techniques were worked out.

Evaluation— Evaluation tools and techniques were planned, developed and implemented. Pretest was given before the implementation of the program. Based on the test content tests as posttest 1 and posttest 2 were prepared.

3.7.2. 8 stating instructional objectives for the learner

Instructional objectives are stated based on the nature of the content selected and the objectives of the work.
**Knowledge and understanding:**

1. Teachers tell the concept and nature of Inclusive Education
2. Teachers tell about history and development of Inclusive Education
3. Teachers identify the differently abled students.
4. Teachers tell about remedial treatment to be used.

**Application:**

1. Teachers diagnose about the special abilities or disabilities in the students.
2. Teachers apply appropriate remedial treatment for the differently abled students
3. Teachers use various techniques to improve the teaching-learning process.
4. Teachers try for the successful inclusion of the differently abled students

**Skill:**

1. Teachers observe the behavioral changes in the students at every stage of remedial treatment.
2. Teachers try to prepare their own checklist about specific different ability through observations.
3. Teachers apply the technology skillfully for various abilities.

**Attitude:**

1. Teachers help the differently abled students.

3.7.2. 9 –Sequencing of content within each instructional unit for logical learning.

The content is prepared according to the maxims of teaching.

1. Concept and nature of Inclusive Education
2. Difference between special, integrated, and Inclusive Education
3. History of Inclusion, and various legislations
4. Need and Importance of Inclusive Education.
5. Different Abilities in students
6. Orientation of specific Different ability
   - Learning about: - What is the nature of specific different ability?
   - How to identify it?
   - Implementing the techniques
7. Learning about; Remedial strategies

**Figure: 10 – Orientation aspects**

3.7.2.10 Designing of instructional strategies so that each learner can master the objectives. Program was based on social constructivism principles. Instructional strategies are planned according to the principles of constructivism.
Figure: 11- Techniques used in program

- Discussion about abilities/disabilities
- Cooperative learning-working in groups
- Brain Storming Sessions
- Collaborative Learning
- Active and Participatory learning
- Multilevel Instructional Design
- Case Studies of Inclusive Schools
- Self-study
3.7.2. 11- Planning of the instructional message and delivery.

A) Orientation about the following aspects: (Two sessions)
   - Nature of the program
   - Objectives of the program
   - Concept of Inclusive Education
   - Need and importance of Inclusive Education
   - Different Abilities in students

B) - Weekly schedule of the activities: (Total six weeks)
   - Week-one – Nature of inclusive Education and Orienting about Gifted.
   - Week-two- Mentally Challenged.
   - Week- three- Physically Impaired, a) Hearing Impaired b) Visually Impaired
   - Week- four- Learning Disabilities, a) Dyslexia b) Dyscalculia
   - Week- Five- Learning Disabilities a) Dysgraphia b) ADHD
   - Week- Six- Physically Impaired, Orthopedically Impaired.
Table 17 - Weekly Schedule of Activities

<table>
<thead>
<tr>
<th>No</th>
<th>Schedule</th>
<th>Activity</th>
<th>Material Used</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Day one</td>
<td>Orientation of specific Different ability</td>
<td>PPT, Video shoots, photographs, print material</td>
<td>Discussion, Brain storming, question-answers, Viewing of video.</td>
</tr>
</tbody>
</table>
| 2  | Day two& day three | Learning about (self-instruction)  
1) What is the nature of specific different ability?  
2) How to identify it?  
3) Implementing the techniques | Print material – Fact sheets, Check Lists, Techniques. Power point presentations, case studies. | Cooperative learning and collaborative learning, Self learning, Discussions with the researcher if required, review of the literature. |
| 3  | Day Four & day five | Learning about; (self-instruction) Remedial strategies Case studies Inclusion of these students in general schools. | Print material – Fact sheets, Check Lists, Techniques. | Work in pair, review of the literature. |
| 4  | Day six  | Discussion in groups Self-evaluation Preparedness for the application | IEP samples | Collaborative and active learning Multilevel, instructional design and modifications |

The same schedule will be followed for all the six weeks
3.7.2. 12- Development of evaluation instruments to assess objectives.

Evaluation instruments are planned according to the objectives as:-

1- To assess the knowledge level about inclusive education of school teachers.
   1- test-1---$O_1$  Pretest-1---$O_2$

2- To test the knowledge of teachers about the following:
   ➢ History of inclusive education
   ➢ Need and importance of inclusive education
   ➢ Knowledge of different abilities in the students.
   ➢ How to deal with differently abled students.
   ➢ Assignments during the program period.

3- Test the effectiveness of the program in Inclusive Education
   • Posttest-1---$O_3$  Posttest-2---$O_4$

3.7.2. 13  Select resources to support instruction and learning activities.

Resources selected to support instruction and learning activities:-
   • Orientation lectures by the researcher about the area selected.
   • Information given by experts in different fields of different abilities.
   • Video shoots regarding the activities take place in inclusive schools
   • Power point presentations regarding various different abilities.
   • Internet search for latest information regarding the topics
   • Information about how to deal with differently abled students
   • Case studies of successful inclusion of the differently abled students

3.7.2. 14 Expert Review-

Expert opinion regarding the KBPIE developed was taken. Discussions were carried out with the Research Guide to finalize the program. Theory part of the program was thoroughly checked. It was given to four principals and five school teachers for their feedback. Experts, Principals, and school teachers gave their feedback about the Program.
Changes were made according to feedback and the program was thus ready for pilot testing.

- History part should be precise, not in detail; Information about different laws should be in short.
- Cooperative learning –details should be given.
- Detailed information about learning disabilities should be given.
- More information regarding IEP is required with few examples.

**Marathi version of the program:**

Material of the Knowledge Based Program in Inclusive Education so developed was translated in Marathi under the valuable guidance of experts knowing both the languages well. Program was again translated in English to check.

**3.7.2. 15 Master Validation of the Program in Inclusive Education**

Step -1 the Knowledge Based Program in Inclusive Education (KBPIE) developed was implemented on five English medium school teachers and five Marathi medium school teachers, teaching for higher primary. Discussions were carried out with the subject (school teacher) about the program. Feedback was taken from the teachers. Pre-test and post tests were conducted and effectiveness was tested. Necessary changes were made.

Step-2 the Knowledge Based Program in Inclusive Education (KBPIE) for school teachers teaching for higher primary was administered to sample of school teachers selected as per the schedule planned.

<table>
<thead>
<tr>
<th>No</th>
<th>Name of the School</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S.N.B.P. School &amp; Jr.College, Yerwada, Pune</td>
<td>Feb-March 2012</td>
</tr>
<tr>
<td>2</td>
<td>Prodigy School, Wagholi, dist. Pune</td>
<td>Feb-March 2012</td>
</tr>
<tr>
<td>3</td>
<td>Dr. N.K.Gharpure Prashala, Bajirao Road, Pune</td>
<td>July-August 2012</td>
</tr>
<tr>
<td>4</td>
<td>S.S.B.Gujar Prashala Talegaon Pune</td>
<td>July-August 2012</td>
</tr>
</tbody>
</table>

Testing the effectiveness of the Knowledge Based Program in Inclusive Education (KBPIE) on achievement
3.9 Methodology of Research—Experimental Research, Objective-3

Experimental method was used to study the effectiveness of the program in Inclusive Education for School Teachers. After study of various research designs for instructions, a suitable research design was selected.

3.9.1 Research Design

Research design is a plan, structure and strategy of the investigation conceived so as to obtain answers to research questions and to control variances (Kerlinger and Pedazur). Experimental design is a blueprint of the procedure that enables the researcher to test his/her hypothesis by reaching valid conclusions. Here the aim of research is to determine the influence of a variable (program) on one group; therefore the experimental design used for research was One Group Pre-test Post-test Design.

Elaborated version of One Group Pre-test Post-test Design was used.

**Single group interrupted time series design:**

\[ O_1 - O_2 - X - O_3 - O_4 \]

Steps used are;

1- A group of teachers was finalized as a sample group using the results obtained from survey. Sample was selected from the school teachers teaching for higher primary. A pretest on knowledge of Inclusive Education was developed and standardized by the researcher and was administered to the sample group.

Design: Single group interrupted time series design (elaborated version of one group pretest posttest design)

- Test (\( O_1 \)) was administered to the selected school teachers. Scores were calculated. Analysis was done and the content was modified after studying the result. Parallel versions of test was prepared, out of which one was used as a pre-test.
- Pretest-1 (\( O_2 \)) was administered after one month to the same group of teachers. Scores were calculated.
- Difference between the means was calculated. t-test was used to find out the significance of difference between two means.
- Program in Inclusive Education was administered to the same group for six weeks.
After completion of program posttest (O₃) administration was done.
Posttest-2(O₄) was administered after one month to the same group.
T-test was used to find out statistical significant difference between O₂ and O₃.
T-test was used to find out statistical significant difference between O₂ and O₄.
Feedback about the program was taken from the school teachers using a questionnaire.

![Diagram of Inclusive Education Program]

Figure: 12 – Inclusive Education Program
3.9.2 Variables in research:

**Independent Variables**: Program in Inclusive Education developed for school teachers was the independent variable of the research.

**Dependent Variables**: Achievement of school teacher’s knowledge and application of Inclusion, School teacher’s feedback about the program were the dependent variables of the research.

3.9.3 Population

All the school teachers teaching for higher primary students were the population of the experimental research.

3.9.4 Sample Selection

Selection of Schools- The schools were selected by purposive method of sampling. Two English medium and two Marathi medium general schools were selected for the following reasons

- Permission of the principals to conduct the sessions and to implement the program.
- Cooperation of the school teachers for undergoing the program.
- Availability of computer lab (LCD), and adequate computers for use.
- Convenience of researcher, as researcher had to visit the schools twice a week for sessions.
- Medium of instruction

Selection of School Teachers- As per the nature and necessity of training, researcher had decided to select school teachers teaching for higher primary standard students. At this particular level of age, identification, if not done, becomes easy for the teachers.80 School Teachers teaching in the schools given in the table were selected for research.
Table 19 - Sample for Experiment

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of the School</th>
<th>School Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S.N.B.P. School &amp; Jr.College, Yerwada, Pune</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Prodigy School, Wagholi, dist. Pune</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Dr. N.K.Gharpure Prashala, Bajirao Road, Pune</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>S.S.B.Gujar Prashala Dhamdhere, Dist. Pune</td>
<td>20</td>
</tr>
</tbody>
</table>

3.9.5 Tools for Data Collection

Knowledge Based Program in Inclusive Education (KBPIE) was prepared to enrich the content regarding various different abilities, laws about Inclusion, strategies and techniques, etc. To test the effectiveness of Knowledge Based Program in Inclusive Education (KBPIE), knowledge tests were developed and used.

1-Preparation- Six important areas of different abilities were selected for assessing the knowledge. Following areas were selected for content test.

- History and various laws made about Inclusion of all the students in general schooling.
- Knowledge about Giftedness, mentally challenged, Hearing impairment, Visual Impairment, Orthopedical impairment, Cerebral palsy, and various Learning Disabilities.
- Knowledge of application of various strategies and techniques for the differently abled students
- Knowledge about evaluation of differently abled students

Instructional Objectives- Instructional Objectives of test were identified. Assessing the knowledge and understanding level, application, skill and analysis of the content.

Blueprint of the tests- Considering the aspects such as objective, units, and blueprint was prepared.
### MARKING SCHEME FOR THE TESTS- \((O_2,O_3,O_4)\)

**Table 20- Marking Scheme**

<table>
<thead>
<tr>
<th>Question No. 1 to 25, each question carries 1 mark for the correct answer.</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question A</td>
<td>3</td>
</tr>
<tr>
<td>Question B</td>
<td>2</td>
</tr>
<tr>
<td>Question C</td>
<td>8</td>
</tr>
<tr>
<td>Question D</td>
<td>2</td>
</tr>
<tr>
<td>Total marks</td>
<td>40</td>
</tr>
</tbody>
</table>

**Table 21-BLUE PRINT**

<table>
<thead>
<tr>
<th>No</th>
<th>Unit</th>
<th>Objective Question</th>
<th>Short Answer Question</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>K</td>
<td>U</td>
<td>A</td>
</tr>
<tr>
<td>1</td>
<td>Concept and nature of Inclusive Education, Historical background</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Identifying different abilities/disabilities</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Dealing with differently abled students</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Inclusion of differently abled students</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td>7</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>
Constructing Questions- After preparation of a blueprint for all the tests, appropriate questions were prepared according to the weightage given in the blueprint. More than four questions were prepared for each part. For each unit questions were prepared of each question type given in the blueprint. Sequencing of the questions has been done.

Validity and Reliability of the Test

Expert Opinion – Test prepared was given to the experts selected (6 Experts). Experts were from SCERT, Resource persons from DIET, Counselors from Institutions, Professors of Psychology and special Education. Experts, after a careful study of the test had given the opinions as;
1-For short answer questions – Specific questions should be asked to avoid confusions regarding answers.
2- More questions should be on how to deal with differently abled students
3- Less weightage should be given to the questions about laws related to education of differently abled students.

Expert opinion was taken into consideration and the necessary changes were made.

Pilot Study – Ten School teachers teaching higher primary students were selected for pilot study from Anglo Urdu Boys High school, and the test developed was administered to them. Following points were noted down from the study.

- What is the required time for completing the test?
- Are the instructions given adequate for giving the test?
- Is there any difficulty, teachers face while giving the test?
- Is it essential to revise some questions?
- Validation of the tool developed.

Conclusions – Time required for completion of test was 40 minutes. Instructions were adequate. No problems regarding the nature of objective and short answer questions were observed.

Marking Scheme – Possible responses to the question items are prepared. Value points are graded and marks were given to each item. Scoring key for objective questions was prepared. For S.A. questions points of possible answers were prepared and marks were decided accordingly to avoid subjectivity.
Question-wise Analysis –

**Administering the test developed** – Pretest prepared was administered to the selected group of school teachers under examination conditions. The checking of answer sheets was done and scores were tabulated.

**Pretest-1 (O₂)** – Pre-test was prepared following the same procedure used for test one. The second version of the test prepared from the same construct domain was administered to the same group of teachers. Results were tabulated. Difference between the means was calculated. Correlation between two tests had been found out.

**Posttest-1 (O₃)** - Posttest was prepared following the same procedure used for pretest one. After administration of Program in Inclusive Education to the sample of teachers selected, 3rd version of the test prepared from the same construct domain. It was administered to the same group of teachers immediately after completion of the program. Results were tabulated.

**Posttest-2 (O₄) (Retention test)** – Posttest-2 was prepared following the same procedure used for pretest one. After administration of Program in Inclusive Education to the sample of teachers selected, 4th version of the test prepared from the same construct domain. It was administered to the same group of teachers after a gap of one month. Results were tabulated.

### 3.9.6 School Teacher Feedback

**Preparation** – Feedback about the program was taken from the teachers involved in the sessions. A feedback form was prepared by the researcher.

**Review** - Review was carried out regarding participants’ feedback. Criteria were selected for feedback form as; planning, schedule, content relevance, information given, methodology, appropriateness, researcher’s role, participants’ role.

**Discussion with Experts** - Discussion was carried out with the experts regarding the criteria, nature and design of the form.

**Design** - Criteria for feedback form were finalized. Feedback consisting 15 questions using Likert scale was prepared.

Pilot study was carried out and the feedback forms were distributed to the teachers. Filled forms were collected, scores were calculated.
Qualitative analysis of the responses given by the teachers was done using percentage and pie graph.

3.9. 7 Tools for Data Analysis

Following tools were used by the researcher for statistical analysis of the data collected.

**Test: Means of the tests** – After administration of Both the pretests (O1 and O2), test papers were scored using the model answers and marking scheme prepared. The results were calculated and means of pretest-1 and pretest-2 (O1 and O2) were calculated to find out the correlation.

**Histogram** – Histograms of both the tests were drawn to compare the performance of the teachers on both the tests.

**Test - Standard Deviation** – Standard deviation was calculated from the data collected for both the tests, O1 and O2.

**Test – T-Test-** Using the mean and standard deviation values calculated as above, the t-value for the significance of difference in means of the scores for both the tests for the selected group was calculated with the help of T-test for the same group.