

CHAPTER -3
METHODOLOGY

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3.1. Introduction

Research is an effective process which helps us to advance our knowledge and understanding of the education process. The major responsibility of the scientist is to set up a research design capable of providing the data necessary to the solution of the problem. The deliberate choice of a design increases the likelihood that the data will yield information on the research question (Barr, 2004).

The successful outcome of the research depends upon methodology adopted. The selection of method for research work depends upon the tools and techniques that the researcher uses. There are several methods available to research workers in the matter of data collection. Taking into account the need and objectives of the research problem, the nature of the subjects involved in the study and such factors as time and cost, the final decision on the procedure is made (Siddhu, 2003).

3.2. Methodology

The researcher describes the methodology of the present study in this chapter under the following headings.

3.2.1 Research Design

3.2.1.1. Experimental Design

3.2.1.2. Sampling procedure

- **Sampling technique**
- **Selection and grouping of the sample**
- **Variable**

3.2.1.3. Selection of Media

3.2.1.4. Tools selected for the study

- **Preparation of Instructional Material**
- **Test Tools**

3.3. Data collection procedure

3.4. Data analysis procedure

3.5. Conclusion

3.2.1. Research Design

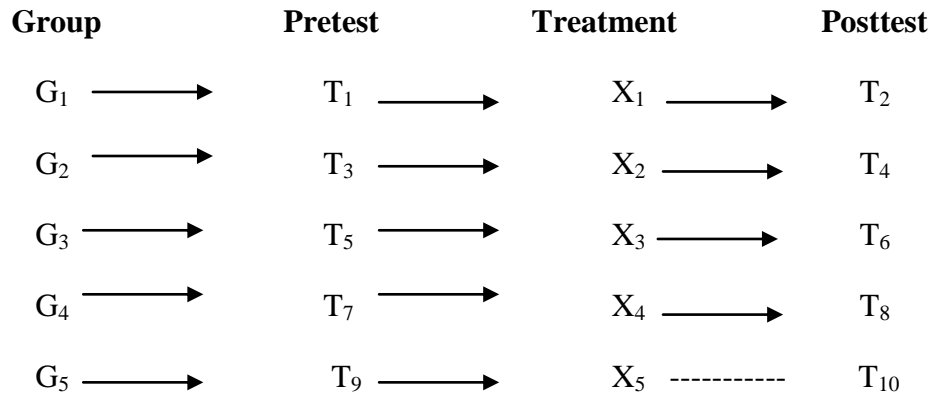
Selection of right approach depends upon the design used in the study, availability of the sample and nature of statistical treatments. With this awareness, the researcher spent considerable time in planning her research design.

3.2.1.1. Experimental Design

Experimental Design is the Blue print of the procedure that enables the researcher to test the hypotheses by reaching valid conclusions about relationships between independent and dependent variables (Best and Kahn, 2003).

The use of experimental design in Social science is complicated as there are limits to experimentation among human beings. Strictly controlled experimentation is rarely feasible with human beings as they are always dynamic. Nevertheless, useful and fairly valid experimental research is possible in several areas of social sciences such as social education, teaching technology, economic development and so on. It is also possible to achieve reasonable degree of validity by adopting appropriate techniques (Krishnaswamy and Renganathan, 2006). On the basis of above justification, the investigator attempted to adopt the True Experimental design with some limitations.

Since present study is of experimental nature, the Pretest-Posttest Control Group Design was used and a pretest was administered as a measure of the dependant variable. On the basis of the scores, the subjects were randomly assigned to the experimental groups and the control group. The experimenter adopted new methods of teaching to the experimental groups and conventional method to the Control group for a specified period of time. At the end of the experiment, the experimental groups and control group were administered a posttest to measure the effect of the treatment on the dependant variable. The Pretest-Posttest Control Group Design was extended to all the five groups in each institution as shown below:



Here G₁, G₂, G₃, G₄, & G₅ indicate the groups and the members of the groups were given treatment as X₁, X₂, X₃, X₄, & X₅ indicating Multimedia approach, Cooperative learning, Situational approach, Brainstorming and Conventional method respectively. T₁, T₃, T₅, T₇ & T₉ indicate pretest and those with T₂, T₄, T₆, T₈ & T₁₀ indicate posttest.

The Research design followed in this investigation is schematically represented in the following Table 3.1.

Table 3.1 Schematic Representation of the Research Design

Sl. No.	Components	Source	
1	Nature of the Experimental Design	Pretest -Posttest Control Group Design	
2	Variable	Dependent Variable 1.Knowledge 2.Attitude	Independent Variable 1. Four Instructional methods and one Conventional method Sub variables 2.Stream of Courses 3. Type of Institution 4.Locality 5. Subject Specialization (Optional)
3	Tools Used	1. Module on Human rights education 2. Knowledge Assessment tool 3. Attitude Scale	
4	Sampling Technique	Purposive Sampling and Stratified Random Sampling	
	Sample size	Control group	Sample size (Nos.) 69
		Four Experimental Groups	
		• Multimedia approach	65
		• Cooperative learning	75
• Situational approach	68		
• Brainstorming	65		
Total	342		
5	Treatments Provided	Control Group : Conventional method Four Experimental Groups : Four Instructional methods	
6	Duration of teaching/day in each institution	One to one hour and fifteen minutes per day (for each method) x 5 (methods)	
	Total time taken to complete the Experiment	22 hour x 5 methods in each institution +(Pretest 1½ hours and Posttest 1½ hours)= 25 hours over a period of Four months (Details -given in Appendix-II)	

3.2.1.2. Sampling Procedure

• Sampling Technique

Sample selection is a significant aspect of research study. Improper selection of the sampling method may yield biased information of a research and therefore sample selection should be done with utmost care. Selection and application of proper sampling procedure makes a research study more objective.

In this investigation, the researcher selected a total of 342 female student teachers from 2 Self financing Colleges of Education, one Government College of Education and one Government Aided Institution in Coimbatore by Purposive sampling method. After the pretest, by adopting Stratified Random sampling technique, the sample in each institution was divided into five groups constituting four Experimental groups and one Control group since different optional subjects were there in each institution. The researcher used the terminology “optional” to refer to the subject specialization of the sample in their undergraduate or postgraduate course.

• Selection and Grouping of the sample

The pretest was conducted to the sample and based on the score, the sample was randomly assigned to five groups in each institution. While doing this, the investigator took utmost care to see that each group comprised more or less equal number of sample.

Considering the optional subject, the investigator could not select the equal sample in all the institutions. This was because in each Self financing college, the students’ strength was less compared to other two types of institution namely Government College and Government Aided Institution. The total sample size in the Government Aided Institution was little less for the reason that the optional subjects namely Computer science, Geography and Tamil were not offered there.

The sample chosen for the study consisted of 342 students purely girls because there is a need to impart Human rights education to the girls since violence against women exists everywhere inspite of the existence of Universal Declaration of Human rights and other legal guarantees by our Constitution specially meant for women and girls in India. Though the males also face Human rights violations, it is

not to the extent of the females. Moreover, if these prospective teachers shape the minds of the future citizens by equipping them with proper knowledge and attitude about the Human rights in the near future, definitely they will in turn enable even the students of the opposite sex to accept and follow Human rights to the core. The distribution of the total sample is depicted in the following Table 3.2 and diagrammatically represented in figures 3.1 to 3.3.

Table 3.2 Distribution of the Total Sample selected for the Study

Sl. No	Type of Institution	Treatments					Total
		Multimedia approach	Cooperative learning	Situational approach	Brainstorming	Conventional Method	
1	Self Finance	27	30	28	27	27	139
2	Government	21	20	22	21	24	108
3	Government Aided	17	25	18	17	18	95
Total		65	75	68	65	69	342

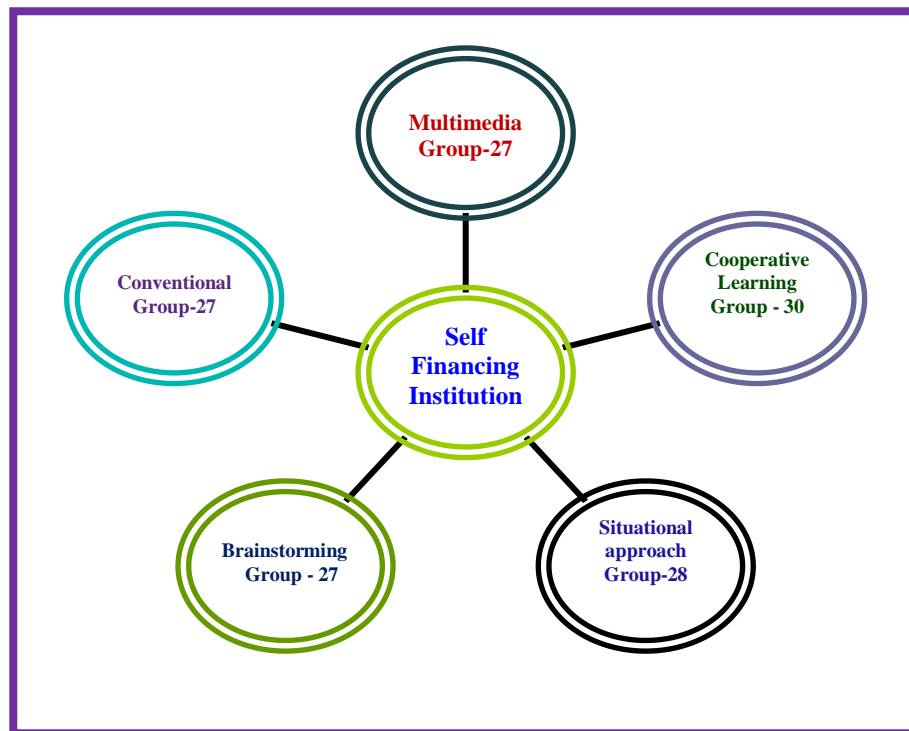


Figure 3.1 Sample from the Self Financing Institutions

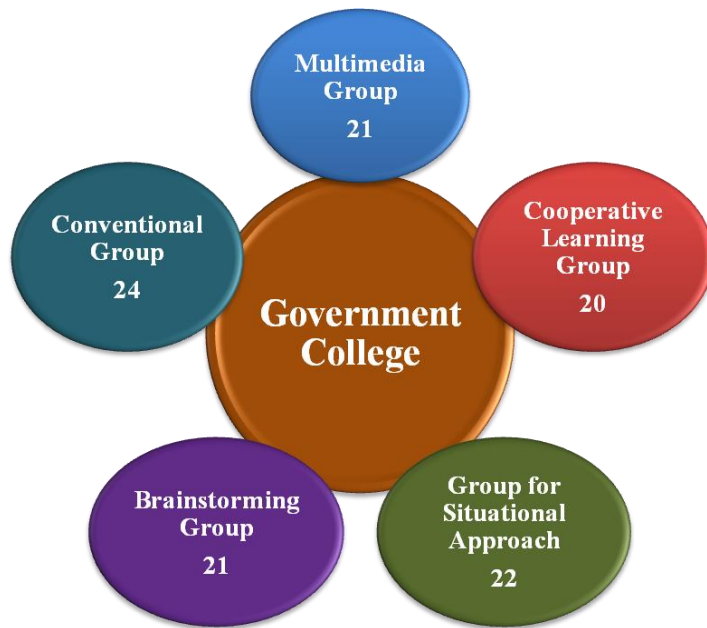


Figure 3.2 Sample from the Government College

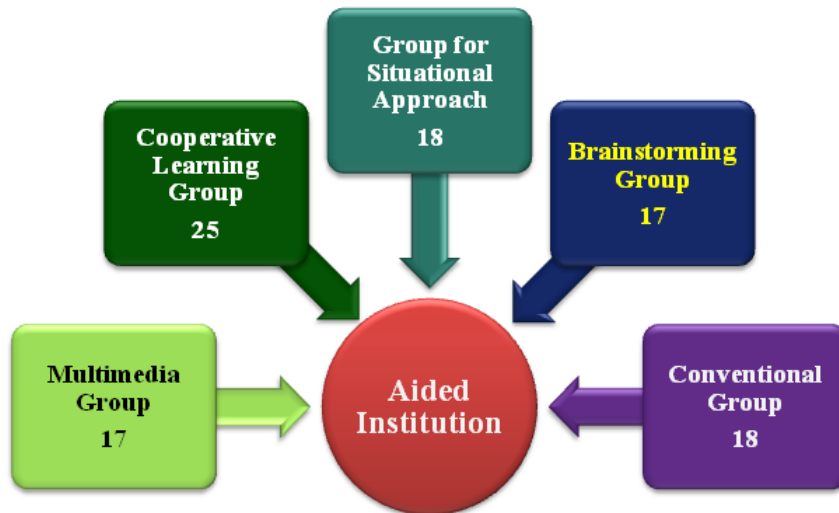


Figure 3.3 Sample from the Government Aided Institution

Out of these five groups, one group was treated as the Control group being exposed to the Conventional method and the remaining four were the Experimental groups, exposed to Multimedia approach, Cooperative learning, Situational approach

and Brainstorming. The percentage of the sample selected for the study in terms of stream of courses they had selected, the type of institution in which they were studying, their locality they had come from and their subject specialization is described in the following Table 3. 3.

Table 3.3 Profile of the Selected Sample

S. No.	Variable		Number of Students Total - 342	Percentage
1.	Stream of courses	Arts group	119	34.80
		Science group	223	65.20
2	Type of Institutions	Self financing	139	40.64
		Government	108	31.58
		Government Aided	95	27.78
3.	Locality	Rural	185	54.09
		Urban	157	45.90
4.	Subject specialization (Optional subject)	Mathematics	87	25.44
		Computer Science	37	10.82
		Physical Science	47	13.74
		Biological Science	52	15.20
		Language	58	16.96
		Social Science	61	17.84

The above table showed that out of the total sample selected, 34.8 percentage of the students chose arts stream and 65.2 percentage was from science stream.

When the Investigator looked into the type of Institution in which the students were studying, 40.64 percentage of students was from the Self financing colleges, 31.58 percentage from the Government College and 27.78 percentage of students from the Government Aided Institution..

Regarding the locality , 54.09 percentage of the students were from rural area and the remaining 45.9 percentage of students were from urban area. It is interesting to note here that the number of students who preferred to go for teaching profession in rural area is higher than the number in urban area which shows that the awareness about the value of professional education is increasing even in the rural area.

Regarding the subject specialization (optional subject), the sample from each optional namely Mathematics, Computer Science, Physical Science, Biological

Science, Language and Social Science was represented by 25.44, 10.82, 13.74, 15.20, 17.84 and 16.96 percentage respectively. This general information of the selected sample is represented graphically in the following Figures 3.4.1 to 3.4.4.

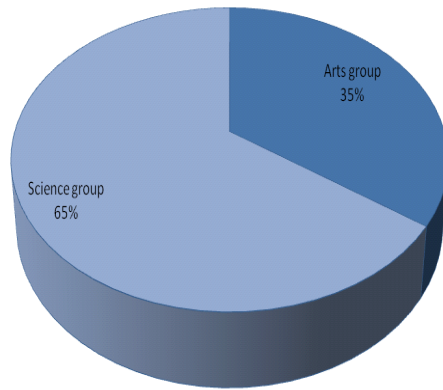


Figure 3.4.1 Sample on the Basis of Stream of Courses

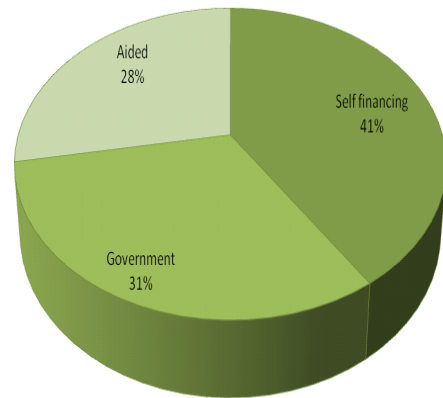


Figure 3.4.2 Sample on the Basis of Type of Institution

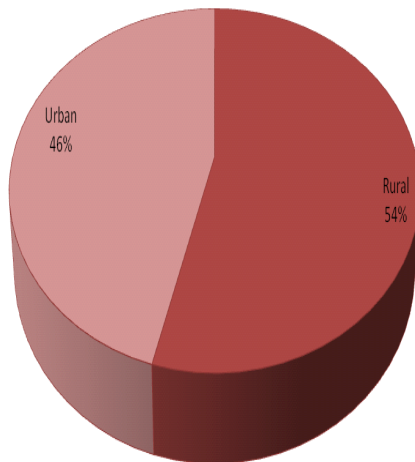


Figure 3.4.3 Sample on the Basis of Locality

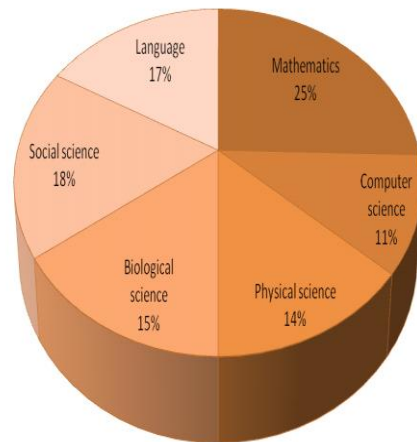


Figure 3.4.4 Sample on the Basis of Subject Specialisation

• Variable

Selection of proper variables is an important ingredient of a good research and always improves the quality of the study and the generalisability of the results. The present study aims at studying the effect of several independent variables as many research studies conducted in the past revealed that variables such as gender,

methods, locality, education and income contribute to differences in learning. Instead of including more variables for the study, a researcher must be able to identify and include only the variables which are likely to have more impact upon the independent variables of the study (Annakodi and Premakumari, 2002).

In this study the two main dependent variables considered were Knowledge and Attitude. The main independent variables were Five Instructional Methods. The sub variables considered for study were Stream of Courses, Type of Institution, Locality and Subject Specialization (optional subjects) the details of which were obtained from a carefully worded background information form from the subject (**Appendix I**). All the variables selected are depicted in the following Table 3. 4.

Table 3. 4. Variables Selected for the Study

Sl. No	Variable	
1	Dependent Variable	
	1.Knowledge 2.Attitude	
2.	Independent Variable	
	1.Five Instructional methods	Multimedia approach, Cooperative learning, Situational approach, Brainstorming and Conventional method
	2. Stream of Courses	Arts stream and Science stream
	3.Type of Institution	Self Finance, Government and Government Aided
	4. Locality	Rural area and Urban area
	5. Subject Specialization (Optional subject)	Mathematics, Computer science, Physical Science, Biological Science, Language and Social Science.

3.2.1.3. Selection of Media

Since the main objective of the present study focuses upon finding out the effect of five different methods namely, Multimedia approach, Cooperative learning, Situational approach, Brainstorming and Conventional method in teaching Human rights education, the investigator selected these four media as instructional methods and one Conventional method for the study and the procedure followed is described below.

Multimedia approach

Multimedia approach of teaching is a strategy that comprises more than one instructional technique for teaching a particular content (Kumar and Raja, 2010)

"Multimedia can stimulate more than one sense at a time, and in doing so, may be more attention-getting and attention-holding" (as cited by Baranisree,2012). Multimedia is media and content that uses a combination of different content forms. It includes a combination of text, audio, still images, animation, video, or interactivity content. It forms a technique (as the combining of sound, video, and text) for expressing ideas in which several media are employed (Merriam-Webster Dictionary,2010). This contrasts with media that use only rudimentary computer displays such as text-only or traditional forms of printed or hand-produced material.

Multimedia is usually recorded and played, displayed, or accessed by information content processing devices, such as computerized and electronic devices, but can also be part of a live performance. The term 'Multimedia Instructional System' is very effective in providing dynamic environment for the instructors, students and others in the field of education. It offers an effective and efficient means of improving quality, delivery and presentation of educational and informational material (Jayanthi, 2004).

In this current study, the investigator used Multimedia which included Charts, Flash Cards, Newspaper clippings, Animation and Power Point presentation for providing instruction on the selected content area to the sample. For preparing animation and Power point presentation, the investigator consulted the experts in Computer education. (**Appendix VII**)

Multimedia teaching is adopted by the investigator to provide students with opportunities to represent and express their prior knowledge about Human rights as Multimedia can be effectively used to present various situations of violations of Human rights at the global level. This method of teaching enabled the investigator not only to engage students and provide valuable learning opportunities. Multimedia enabled the student-teachers to work collaboratively to gain team-based experience, to develop deep reflective thinking on Human rights and this also created vicarious thinking and turns distant happenings into personally meaningful learning opportunities and to face the real-life situation of problem-solving.

Multimedia -oriented projects, therefore, like many other problem-based learning solutions, can be appropriately used as an innovative and effective tool in a problem-based learning environment for the acquisition of problem-solving skills.

This type of student-centered learning approach allowed the student-teachers to construct their own knowledge and understanding, and determine their own learning goals. The role of the teacher, in this context was to stand aside instead of occupying the centre stage and facilitate learning and assist the students in the construction of their knowledge.

Cooperative learning

Cooperative learning can be operationally defined as a method of organizing classroom activities into academic and social learning experiences. It is a form of active learning where students work together to perform specific tasks in a small group (Devi, 2009) and could work well in teaching at all stages of learning. In this teaching method, small teams, each with students of different levels of ability use a variety of learning activities to improve their understanding of a subject. Each member of a team is responsible not only for learning what is taught but also for helping team mates learn, thus creating an atmosphere of achievement. The Cooperative learning comprises of some basic elements which are as follows:

Interdependence: Students must perceive that they are positively inter-dependent with other members of their learning group.

Accountability: All the members are accountable for mastering the materials or content selected for learning.

Individual Difference: In Cooperative learning groups the students are typically homogenous and heterogeneous in ability.

Leadership: All members share the responsibility for performing leadership actions in the Co-operative learning groups

Individual responsibility: Responsibility for each others' learning is shared among the groups in order to ensure that all members do the assigned work.

Task maintenance: The goals of Cooperative learning groups focus on bringing each member's learning to the maximum and on maintaining good working relationship among the students.

Social skills acquaintance: Students are also motivated to use interpersonal skill and collaborative skills of leadership, communication etc. when they work in a group.

Teacher's role: The teacher observes the group, analyse the problems faced by the students while working together and gives feed back to each group on how effectively they are working. (as cited by Jeyanthidevi, 2009)

The basic elements of Cooperative learning are picturised in the following Figure 3.5.

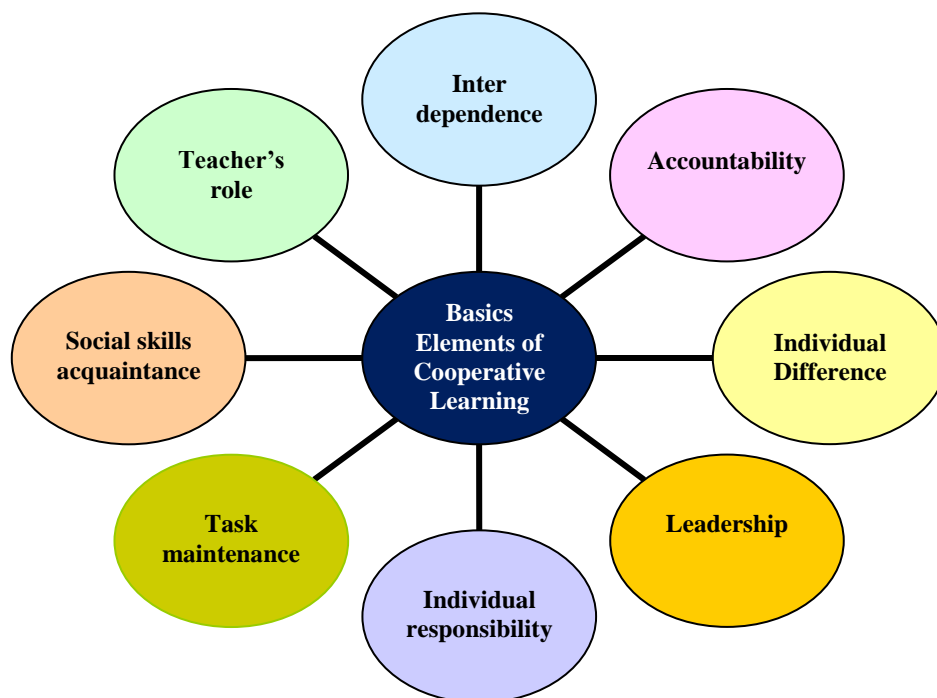


Figure 3.5 Basic Elements of Cooperative Learning

When the basic elements are effectively implemented in formal Cooperative learning situations as in the context of teaching Human rights, it provided an integrated system for instructional organization and design. The investigator structured the Cooperative learning by incorporating all the elements by providing appropriate learning situations in Human rights and by making the student-teachers get themselves involved in learning about Human rights by discussion. The sample selected for the Cooperative learning was divided into five groups in all the institutions but since the sample size in each institution differed, the number of students in each group varied. In each Self financing college, every three students formed a group, in the case of Government college every four students formed one group and in Aided Institution every five members constituted one group separately. In this way the grouping was done which is given in Table 3.5

Table 3.5 Subgroups of the Cooperative Learning Prior to the Treatment

Sl. No	Type of Institution	Total Number of the Trainees	Serial Number of the Trainees
1	Self Finance	15	1,6,11 2,7,12 3,8,13 4,9,14 5,10,15
2			1,6,11 2,7,12 3,8,13 4,9,14 5,10,15
3	Government College	20	1,6,11,16 2,7,12,17 3,8,13,18 4,9,14,19 5,10,15,20
4	Government Aided Institution	25	1,6,11,16,21 2,7,12,17,22 3,8,13,18,23 4,9,14,19,24 5,10,15,20,25

In the current study, the investigator made use of the technique of peer-learning as this contributed to the mastery of the material to be learnt not only with the partner individually but also as a group. Every classroom lecture was divided into separate thematic areas. In order to study the effectiveness of Cooperative learning, the investigator gave a brief outline of the thematic instructional areas and then the students were asked to read the material provided to them.

The selected themes were then discussed by the groups in the light of the general orientation and with the text materials given to them. When discussions were going on within the groups, the investigator provided assistance wherever and whenever necessary as a facilitator. On the completion of the discussion, the students were regrouped as follows which is shown in Table 3.6.

Table 3.6 Subgroups of the Cooperative Learning after the Treatment

Sl. No.	Type of Institution	Total Number of the Trainees	Serial Number of the Trainees
1	Self Finance	15	1-5 6-10 11-15
2			1-5 6-10 11-15
3	Government College	20	1-5 6-10 11-15 16-20
4	Government Aided Institution	25	1-5 6-10 11-15 16-20 21-25

In this grouping, each group consisted of five students and the regrouped members discussed the topic. An important feature of this learning was that each

student was compelled to talk, explain the salient points to other trainees and the groups did not have any dominant leader and all of them shared the responsibility amongst themselves.

During the final 5-10 minutes, the students met as a class and the investigator reviewed the discussion made earlier in the group. The small-group interaction motivated and strengthened the solidarity among the members of the group. This method of teaching cooperatively enabled the student teachers to gain a multitude of perspectives in Human rights education. In the light of the classroom interaction, the investigator gave references for further reading.

Situational Approach

Situational approach as a method of teaching is used for assessing and teaching a multitude of concepts and how well students have internalized the concepts. This method captures how a person's level of competence and authenticity in a specific setting varies across the various situations the person encounters. According to Moray (2005) , “Situational approach refers to keeping track of what is going on around you in a complex, dynamic environment”. In the words of Adams (1993) Situational approach is “knowing what is going on so you can figure out what to do”.

Situational approach as a method of teaching portrays not only the adaptation of students at a broad, general level but also provides a more nuanced perspective by taking into account situational variability as well as variability in experienced competence and authenticity.

Situational approach falls under social constructivism and it characterises the nature of knowledge to include the following: (1) knowledge is not a passive commodity to be transferred from a teacher to learners, (2) pupils cannot and should not be made to absorb knowledge in a spongy fashion, (3) knowledge cannot exist separately from the knower, (4) learning is a social process mediated by the learner’s environment, and (5) the prior or indigenous knowledge of the learner is of significance in accomplishing the construction of meaning in a new situation.

Although numerous definitions of Situational approach have been proposed, Endsley's definition (1995), "the perception of elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of

their status in the near future," is firmly established and widely accepted. The pedagogy of Situational approach is significantly conducive to integrate theory with practice.

This Situational approach of teaching has relatively strong practical significance and feasibility derived from the case study analysis. Case Analysis allows students to learn by doing. Cases improve the students ability to ask the right questions, in a given problem situation. Their ability to identify and understand the underlying problems is also enhanced. Case studies provide real-life examples of the underlying theoretical concepts. It also provides students with an exposure to the actual situations prevailing in the society which would enable them to face the real world (Lundberg, 1993)

Situational approach has been recognized as a foundation for successful decision-making across a broad range of complex and dynamic systems of study in the areas like Human rights education. In this study, the investigator had explored and exploited the strategy of Situational approach to teach Human rights because by this approach it is much easier to perceive the hundreds of events related to Human rights and guides the students-teacher to learn Human rights in a very natural way. Learning in such a relaxing phenomenon, learners can understand everything in real manner. Trainees know in certain situations the real picture of the incidents in the classroom transaction.

In every class, two to three situations and incidents of violations of Human rights reflecting the real happenings in the society which were narrated in the list of situations relevant to the content on Human rights mentioned in the module prepared by the investigator were quoted to the Situational approach group. Interactivity among student teachers encouraged them to identify their own ideas and beliefs. The study also brought to light that teaching strategies should emphasize solving problems and empowerment of the learners.

Brainstorming

Osborn (1953) is the first to formulate a systematic approach to use Brainstorming. It is generally conducted to generate as many ideas as possible through all group members' participation in which no discussion or critique of ideas take place but all ideas are recorded (Akderes,2011). By Brainstorming, thinking

about a question from different perspectives, as well as exploring the perspectives of their classmates, students can develop the skills to help them access and develop a broader range of ideas in a situation. This technique can be used to seek solutions to problems that are both theoretical and practical.

Beginning a brainstorming session by allowing students some time to think about and respond to a question individually yields a richer variety of ideas and encourages all students to actively participate (Christmas, 2007). Figure 3.6 given below depicts how a problem is analysed from different perspective in a Brainstorming session.



Figure 3.6 Different Perspectives of Brainstorming

For the best results, the following rules for brainstorming sessions should be observed.

- Action
- All ideas are recorded
- No criticism – all ideas are valid
- Quantity is important, not quality
- Be imaginative
- Build off each others ideas
- Get to the point

Procedure to Conduct the Brainstorming Session

A well-managed brainstorming session involves several steps as follows:

- (a) At the beginning of the session, the moderator (leader) should explain the objectives of the session and the rules of the brainstorming session.
- (b) After several minutes of brainstorming, when the atmosphere is relaxed, the predefined topic can be introduced.
- (c) All suggestions, however outlandish, are recorded by a group member. No explanation and suggestion is encouraged or judged at this stage.

(d) The moderator may help the participants for generating ideas by making comments such as “very good”, “thank you”, and so forth, but should influence the participants by asking questions supporting any of the areas of the results.

(e) At the end, the moderator should thank the participants for their active approach and make sure that they know how the results will be evaluated and used.

(f) The moderator then categorizes and analyses the responses at which stage some are combined, adopted or rejected for producing new ideas.

(g) Finally the group makes recommendations and takes decisions on the problem. An evaluation method is additionally used for to identify the ideas that have a value of implementation (Balackova, 2002). The stages of Brainstorming are depicted in the following Figure 3.7.

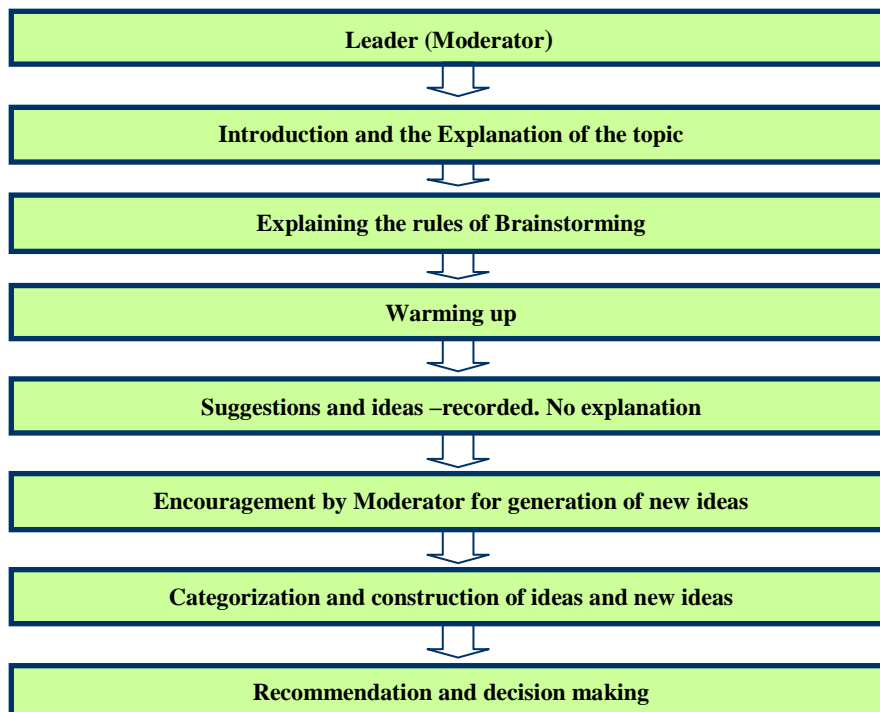


Figure 3.7 Stages of Brain Storming

In the present investigation, the investigator began the session by citing one to three situations on the violation of Human rights. Students then expressed possible and relevant answers and explanations to the situations posed. Contributions were accepted without criticism or judgement; initially, some students were reluctant to speak out in a group setting but brainstorming as an open sharing activity encouraged all students to participate. By expressing ideas and listening to what others say, students adjusted their previous knowledge or understanding, accommodated new information and increased their levels of awareness.

Then the investigator divided them into small groups and gave them a free hand to choose a leader and a recorder and defined the problems of Human rights in the specific module to be brainstormed. The recorder was instructed to write down all responses on the board without criticizing and evaluating the responses. The investigator emphasized on active listening during these sessions. Students were encouraged to listen carefully and politely to what their classmates contributed, to tell the investigator when they could not hear others clearly and to think of different suggestions or responses to share. Finally the generated ideas were categorized under different Human rights. In the current study, students learnt to generate a plethora of ideas, to accept and respect their individual differences, to share ideas and expand their existing knowledge on Human rights by building on each other's contributions.

Conventional method

Conventional method is a method of communication which is deeply engraved in the fabric of the educational system and the most commonly used lecture method being the economical way of giving a vast amount of information across to a large group within the shortest time. It involves “teaching by means of the spoken word”. It is also called “walk, talk and chalk” method (Sharma, 2004). In this method the teacher only talks and the students are passive listeners and provided with ready made knowledge (Yadav,2001). The investigator followed this method to the control group for teaching the content on Human rights education.

3.2.1.4. Tools Selected for the Study

• Preparation of Instructional Material

As Human rights education is a vast field, having multi dimensional characteristics, it became necessary for the investigator to identify the areas that could be included as the content in the module to be taught to the sample. On examination of the core content of Human rights education, the investigator arrived at the conclusion of including five units based on the pattern of the **Module** on Human rights education for teaching professionals imparting education in primary, secondary, higher secondary levels recommended by National Human Rights Commission (2007) which are as follows.

- I. Human rights education-The Concept, Meaning and Genesis

- II. International Bill of Human Rights
- III. Fundamental Rights and Constitutional Guarantees as Enshrined in the Indian Constitution
- IV. Common Violence against Women
- V. Mechanisms for Enforcement of Human rights - Organisation of Human rights (Scheme of Instruction -given in **Appendix II**)

These areas were finalized in consultation with the experts who have special knowledge in Human rights education-2 lawyers- dealing with the cases of Human rights and its violations. In addition, experts like two experienced teacher educators from two Colleges of Education in Palayamkottai and two Professors working in Arts and Science college in Periakulam handling the University Grants Commission of India sponsored courses on Human rights and its Violations and Women's Rights.

A thorough and systematic examination of all the related area of Human rights education in books, journals and net resources also helped the investigator in the preparation of the content for teaching Human rights.

The whole content was reviewed in the light of the suggestions and the opinions of these experts and thus face validity and content validity of the Module prepared by the investigator was established (**Appendix-III**).

To explain the content to the Situational approach group, the investigator prepared a narration of thirty two situations and incidents of violations of Human rights which reflects the happenings in the society which was also given to the above said experts for validation after which the narration contained only twenty five situations. (**Appendix-IV**).

• Test Tools

The tools prepared for the measurement of the variables knowledge and attitude were a Knowledge Assessment tool and an Attitude scale which were subjected to scrutiny as follows.

- Item pool
- Reliability and Validity
- Pilot study
- Item analysis

Item Pool

While constructing the tool for the assessment of the knowledge of the student teachers, the investigator prepared the test items by making a review of the related literature and the test items that had been used in various testing situations. A thorough and systematic examination of all the related area of Human rights education in books, journals and net resources also helped the investigator in the preparation of the test items. Thus, a pool of 100 objective type items was developed.

As the investigator also attempted to study the effectiveness of the five methods on the variable namely attitude, the Three Point Attitude scale resembling Likert scale comprising of 40 items having three responses namely Agree, Neutral and Disagree was prepared. The scores allotted to these responses were 2, 1 and 0 in the positive statements and 0,1 and 2 in the negative statements respectively.

Reliability and validity

Research in education is application oriented. It should have a contributory effect on either the theory or the practice of education. The two most important and fundamental characteristics of any measurement procedure are reliability and validity. Only when validity and reliability are established, the findings of the study become trustworthy. In the words of Farrow (2008), “reliability is consistency of measurement over time. If a teacher-created assessment is truly reliable, students who retake a test should receive close to the same score if they have not been re-taught the material that is being tested. Besides being reliable, a test should also be valid. In order for a test to be valid it needs to cover the objectives that were taught”.

For establishing the validity of the tools, the draft items were given to the same experts who had helped in establishing the validity of the module on Human rights education prepared by the investigator for teaching to the student teachers. Based on their suggestions, all these items were edited, reviewed and finalized with 77 Objective test items. The items which tested knowledge were of multiple choice questions with four distracters, match the following, abbreviation, and alternate response. The correct response to each item to the tool was given one mark.

The Attitude Scale was given to the same experts who helped in the scrutiny of the Knowledge Assessment tool. In addition, two Psychologists from two Arts and Science colleges were also consulted in this regard. The items were reviewed in the light of the suggestions of these experts for content adequacy and accuracy and finally the Attitude scale possessing face and content validity consisted of 34 items to test the attitude of the student teachers of five groups towards Human rights education. The Scale at this stage comprised of 18 positive statements and 16 negative statements. The test was meant for the control group and the experimental groups.

Pilot Study

The tool and the Scale thus developed by the investigator were administered to the randomly selected 50 students of Department of Education, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore who were not the subjects of the study. In order to gain confidence and to get their whole hearted involvement in the investigation, the investigator established a good rapport with the student teachers. After teaching Human rights education to the Pilot group, the tool and the scale developed by the investigator were given to measure their knowledge in Human rights education and their attitude towards it and the scores were noted down. The retest was administered to the same group of student teachers to find out the reliability of the tool and the scale with a passage of time.

The two sets of scores (Test and Retest) were collected and the correlation between the two sets was calculated by using the Product Moment of Co-efficient Correlation. The co-efficient of reliability of the tool testing the knowledge and that of the Attitude scale had been established on the above mentioned randomly selected students. The co-efficient of reliability of the test and the retest concerning knowledge aspect were 0.75 and 0.80 and that of the attitude were 0.80 and 0.84 respectively. The reliability co-efficient of the tool and the scale indicates that the both had high reliability values.

Item Analysis

It is concerned with the problem of selecting the items for the final form of the test so that the test will have certain specified characteristics (Nagarajan et al, 2003). Item analysis enables any researcher to find out the difficulty level and

discriminating power . Item difficulty is the percentage of students who get the item right. So lesser the value, the higher the difficulty level.

A test item possesses adequate discriminating power when it is capable of differentiating between superior and inferior students (Bhatia, 1992). In general, for teacher constructed test, an item discrimination above 20 percent is considered to be sufficient. Items that are of moderate difficulty are more likely to establish a high level of discrimination.

In this investigation, after the pilot study, the tool and the scale were used for item analysis. The sum of the scores obtained by all the respondents was calculated separately for each individual. The scores of the respondents were arranged in descending order. The top twenty seven percentage and the bottom twenty seven percentage scores were taken into account. The difficulty index and discriminating power were then calculated. The item for which the difficulty level ranged from 50 to 70 per cent and the discriminating power ranging from 25 to 30 per cent were selected for the study.

Finally the Knowledge Assessment tool comprised of 30 multiple choice questions, 10 match the following items, 10 abbreviations, and 10 alternate response items totaling 60 items. The maximum mark allotted to the Achievement test was 60 each carrying 1 mark.

The Attitude scale consisted of 30 items among which the items number 1, 2, 4, 5, 6, 8, 9, 11, 13, 17, 19, 21, 23, 25,27 and 28 totaling 16 were positive statements and items number 3, 7, 10, 12, 14, 15, 16, 18, 20, 22, 24, 26, 29 and 30 were negative statements totaling 14. In the Scale also, the maximum mark was 60. Thus the item validity was established for the tool and the scale. (given in **Appendix V** and **Appendix VI** respectively).

Formulae Used for Item Analysis

1. The Difficulty Index is calculated using the formula

$$\text{Difficulty Index} = \frac{R_u + R_l}{N_u + N_l}$$

2. The Discriminating Power is calculated using the formula

$$\text{Discriminating power} = \frac{R_u - R_l}{N_u \text{ (or) } N_l}$$

where

R_u - Number of right responses in the upper group

R_l - Number of right responses in the lower group

N_u - Total Number of students in the upper group

N_l - Total Number of students in the lower group

3.3. Data Collection Procedure

The investigator selected student teachers from 4 Colleges of Education in Coimbatore. Out of the 342 sample, 273 belonged to four experimental groups who were to be exposed to four different instructional methods namely Multimedia approach, Cooperative learning, Situational approach and Brainstorming and the remaining 69 students belonged to the control group to be taught by the Conventional method.

The investigator approached the authorities of the concerned Institution to get the prior permission by explaining the objectives and scope of this investigation. The authorities also felt the need for Human rights education to the student teachers and were kind enough to give the permission to carry out the study. The investigator in order to gain confidence and to get the whole hearted involvement of the student teachers explained the procedure which was going to be adopted in detail thereby establishing the rapport with them.

As a first step, the student teachers were given the pretest by distributing Knowledge Assessment tool. The time given was forty five minutes. The response sheets were collected after which the student teachers were provided with the Attitude scale and collected after the same time duration. The investigator divided the total sample into five groups with utmost care on the basis of the scores in the

pretest to measure their knowledge in Human rights education and their attitude towards it the investigator started teaching Human rights education to the five groups by adopting five different methods. The time taken for teaching the content by each method was one hour to one hour fifteen minutes in each institution. The total time consumed was twenty two hours for teaching. After the teaching was over, the posttest was conducted by distributing the same tool and the Attitude scale to the student teachers one after the other which was conducted for the same time duration as the pretest. Over a period of four months, the work was completed in all the four institutions. The collected response sheets were corrected and the scores of the pretest and the posttest were noted down by the investigator and subjected to further analysis. The steps followed by the investigator in each institution were given in Figure 3.8

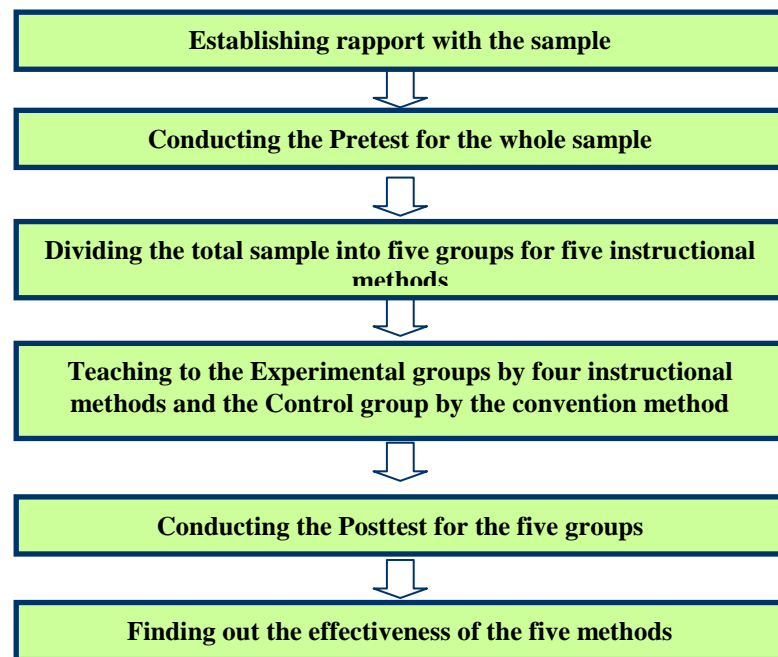


Figure3.8 Steps in Data Collection Procedure in each Institutions

3.4. Data Analysis Procedure

After completing all the administrative procedure, the response sheets of the sample in the pretest and the posttest were corrected and scores obtained were given statistical treatment using Differential analysis namely 't' test, Anova and Ancova. Correlation analysis was also made to find out the relation between the variables.

3.5. Conclusion

This chapter deals with the methodology of the present investigation as enumerated in detail about the methods, the selection of the sample, the tools, data collection procedure, scoring and tabulation and statistical techniques to be used for the study. A thorough analysis and interpretation of data for the present study is made in chapter 4.