

**A STUDY OF SOME  
FACTORS INFLUENCING  
ATTITUDES TOWARDS ENERGY  
EDUCATION AND ITS RELATIONSHIP  
WITH ACADEMIC QUALIFICATIONS  
AND PERSONALITY CHARACTERISTICS  
OF SECONDARY SCHOOL TEACHERS IN  
DEVI PATAN REGION ( UTTAR PRADESH )**

**SUMMARY OF A THESIS**  
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## **SUMMARY**

A brief summary of entire research work has been presented here. It summarizes the research work to give holistic view of this study.

## **INTRODUCTION**

Energy has always been a vital resource for the development of any nation. The prosperity of any nation is measured in terms of per capita energy consumption besides GDP, GNP, etc. While the world has seen hectic industrial activity in the past century it has also come face to face with serious problems arising out of haphazard utilization of the energy resources. Then the concept was 'More the energy, more the development' and Low fuel costs did not encourage efficient utilization of energy. During the intensive process of industrialization the world observed consumption of majority stock of its energy resources and deterioration of global environment. Energy constituted a very small component of total production cost and the industries monopolized business enabled recovery of high cost of energy.

## **IMPORTANCE OF ENERGY**

Energy comprises of the basic natural resources without which existence of humanity is almost impossible. It plays a vital role in development and welfare, as all-important economic activities of the present world are dependent on the use of energy. Energy is an important index of overall economic developmental activities of any country. Therefore, the process of economic development demands increasingly higher level of energy consumption. Efficiency of energy utilization needs to be a continuous activity as there are many unutilised energy resources. Positive trends have been noticed over the past decade in the energy use pattern the world over. Today fossil fuels like oils and coal produce most of the energy. About 70% of total energy produced comes from oil and natural gas, 20% from coal and 10% from all other sources put together. As India is endowed with these resources, their proper harnessing would cater to present needs. Furthermore, this would contribute to the attainment of broader goals of planning, i.e. more national income, employment generation, poverty alleviation and self-reliance.

## **ENERGY EDUCATION IN INDIA**

The renewable Energy Education in India started in early eighties, primarily at post graduate level at the Indian Institute of Technology, when the world started to look at the renewable sources of energy as viable option for the masses after the oil shock of 1973 and the gulf war in 1979. The other premier institutes of technology in the country initiated similar courses, embedding the Energy Education with the mainstream curricula, with available expertise and infrastructure. Energy specific elective topics were added to the curriculum by various Indian universities. It was introduced at school level

(primary, secondary and senior secondary classes) through an initiative of National Council of Educational Research and Training (N.C.E.R.T.), after National Policy of Education came into being in 1986 in which science education was made compulsory up to Ten years of education. Today several other undergraduate programmes and short-term training or refresher courses are being offered besides a large number of National and International events aimed at enhancing awareness about Energy Education among masses. Some work has recently also been initiated on the development of vocational courses.

## **THE PROBLEM**

The present state of global energy is in a very crucial phase. Though, in principle, the limits of conventional sources of energy were well known much earlier, it was specifically the sudden price hike by OPEC in 1973 which shook the world at large. Energy became a critical factor in all walks of life, not only for the nations but also for the individuals, be it cooking, heating and lighting, pumping and lifting water or transportation means. If somewhere it is to meet the requirements of food, fodder and fuel at some other place it is to run the industry. This massive demand has led to a global energy crisis.

Critical analysis of global energy crisis reveals that the shortage of stock is less critical than the short sightedness of users. Alternative sources of energy must be put to effective use. Whether wise decisions are taken about energy and limited resources are used in a sensible way or not will depend greatly on the way young people are educated for the future. For implementing effectively various programmes and policies of energy, it is necessary to have an energy conscious society. This necessitates incorporation of energy elements in school and college level curriculum along with orientation of teachers. Communication media can play an important role in solving the energy crisis. The fuel crisis cannot be solved in a short span of time but concerted efforts have to be made for better utilisation and conservation of the resources.

As far as this study was concerned, the term 'Energy Crisis' is used in the sense of crisis of energy resources. From the preceding discussion, it may be concluded that energy crises is a serious problem particularly for oil importing developing countries like India. The attitudes of users are largely responsible for the present crises. This problem can only be understood by proper scientific study of the root causes — heavy dependence on fossil fuels; lack of awareness of new technologies and costs involved; and attitude towards the energy crises and utilization of non-conventional resources of energy.

## **REVIEW OF RELATED STUDIES**

To review the status of research and development in the subject in general and material development in particular, no significant work has been done so far in any part of globe. However, the authors on energy do talk of the energy crisis and need for developing awareness among the citizens. Here are a few such references, S.M. Hasnain, S.H. Alawaji and U.A. Elani (1998) conducted a survey on the availability of solar energy education program

around the world. It gave an overview of current status of solar education program available around the globe and also highlighted importance of energy information network for solar education program. Anil Misra (2002) of Tata Energy Research Institute (TERI) in his paper presented a critical analysis of the renewable energy education (REE) since its beginning in India. It suggested strategies to make the REE effective in providing better life to millions of people by ensuring consistent and integrated education, and motivating the policy makers. Dr. Yogi Goswami (2002), of University of Florida in his paper described a brief history and the status of solar energy education. Over the last three decades developments in solar energy applications have made it possible to use solar energy for most of our energy needs and even some environmental needs. However, despite the worldwide awareness of environmental degradation, the present public policy does not favour the use of solar energy over conventional fuels. Kiljunen Pentti (2002) has studied the attitudes of the Finnish public towards energy policy. The respondents' conceptions, opinions, beliefs, assessments, attitudes and knowledge about various energy issues were studied by presenting several statements about energy production. Teachers were able to generate philosophical positions which helped them make informed decisions by connections between economic, environment, energy, and political issues, social studies and science. The teachers can also use these positions to facilitate classroom instruction and improve student comprehension. Academic achievement was studied by Philip W. Jackson (1965), who presented a point of view that although the academic difficulties of a student were linked with motivational problems, yet the apathetic student was a more disturbing example of class room failure than the youngster who was not doing well but who cared deeply about his lack of progress. Gebhart and Hoyt (1968), conducted a study in which some personality characteristics were found more significant; and some personality characteristics distinguished between over and under achievers. David G. Ryans (1969), in his famous study of teacher's characteristics reported some personality traits of teachers, which are emotional ability, friendliness, cooperativeness, agreeability, objectivity, sociability, intelligence and restraint.

The above survey of researches and literature indicated that attitude has been studied with several variables such as urbanization, development, population density etc. Similarly the attitudes of teachers have also been studied with reference to activities, social influence and environment. In some researches factors of attitude like Sex, SES, Age, Academic background, Family background etc. have been found significant while in some other studies they have been found insignificant. Although, voluminous research has accumulated in this area in past, yet, the researches have gathered results that are neither stable nor consistent. Thus, larger generalizations over these studies have not been possible. More so, there are several other factors, which were important, but have not been studied in relation to attitude. This indicates that there is still scope for further research in this field. Thereby, the

investigator was motivated to undertake a fresh research in which she tried to relate certain so far ignored factors of teacher's attitude.

### **NEED FOR PRESENT STUDY**

The situation in respect to researches done in the area of Energy Education and development of teaching packages is also not much different. Today except for a couple of references on nature, concept and scope of Energy Education, there is no reference available as regards the development of Energy Education material. Due to this, it is felt that the human attitude and awareness towards the non-conventional resources of energy needs to be studied.

In the present study, an attempt has been made to investigate the attitude and some factors influencing the attitudes towards Energy Education and its relationship with academic qualifications and personality characteristics of secondary school teachers of Devi Patan Region (Uttar Pradesh) INDIA.

### **IMPORTANCE OF THE STUDY**

The world uses energy all times, right from the time people get up till they go to bed or even while sleeping. India also runs its industries on electricity that manufacture fertilisers, tractors and other materials to be used to grow the crops for food, clothing and comfortable living; cement for building houses & shelters; publish books and newspapers to enhance knowledge; TV and radio for entertainment; and other countless inputs necessary for the society and civilisation to prosper. Thus India has used energy in the past, is still using it and will be using more in future. Estimates indicate that at the present rate of consumption, by every 15<sup>th</sup> year the energy demand would be nearly doubled. The world has started realising the inevitability of energy crisis if alternate sources are not suitable harnessed. Of course, these sources have been used in one form or the other in the past, but in the absence of cheaper technologies and their reliable use, no major break-through took place and these were never treated at par with conventional sources. Thus, all these and some other emerging sources of energy are collectively termed as non-conventional. A good deal of work is being done in this direction. Therefore, it is much important to know the community attitude and awareness towards the non-conventional resources of energy and Energy Education, so in this direction this study was very important and useful although covering a small cross-section of community i.e. Secondary school teachers and that too of a particular region of particular state of India.

### **PURPOSE OF THE STUDY**

This study was an attempt at understanding various aspects of energy problems for a meaningful formulation of energy policy to suit the requirements of micro-regions. It is important to have an in-depth knowledge of various dimensions of this problem. If sources of energy and their supply is one aspect of the energy problem the energy consumption patterns, uses of various sources of energy, variation in consumption by income class, land

holding class, caste, size of the family, occupation and season are equally important aspects in the energy field. Even for formulating macro-level energy models, some of the coefficients have to be derived from the micro-level studies. Bearing these aspects in mind, the study was formulated to analyse rural domestic energy consumption patterns in the selected population and in their homes, villages and cities. There exists a good deal of awareness regarding realities of presently available energy resources. Hence educationists, scientists, politicians, sociologists have been emphasising the need for Energy Education programmes. But the concept has differential effects on individuals belonging to different educational qualifications, religions, sex, personalities, curricular groupings and many other personal variables. Therefore, in order to make the programmes of Energy Education successful, it is necessary that attitudes and awareness of secondary schools teachers towards non-conventional resources of energy and Energy Education should be studied.

### **JUSTIFICATION OF THE STUDY**

The core issue of energy crisis is its heavy dependence on oil imports. Oil consumption in India is increasing at 2 MT/year and balance present requirement of 24 MT would have to be met by imports. Unfortunately, future too does not hold any promise on this front. This meant that all its proven oil reserves would have been exhausted by now, which was not realistic. If domestic production continues to increase as planned, the possibilities of discovering big new oil fields are also somewhat remote. To sum up, neither now nor in near future India would be self-sufficient.

There were 7 variables related to attitude in this study, viz. Area, Sex, Stream, Category, Economic Status, Age & Academic Qualification. Personality characteristics and Academic qualifications of both teachers and students have been studied in the field of education. Out of these the academic qualification is considered as indicator of the extent of individual teacher's substantive knowledge. Personality characteristics have been found related to study habits, attitudes and mental ability. Personality traits have been studied with regards to the performance of students but only a few studies have been conducted about this aspect of teachers. Keeping this in mind the investigator wanted to study the relationship of attitude, academic qualifications and personality characteristics in secondary school teachers because till today not a single study has been conducted in India or abroad which reveals the aforesaid relationships. Investigator firmly believes a relationship among attitude, academic qualifications and personality characteristics of teachers exists. It is also hoped that the relationship between personality characteristics and teacher attitude may provide some clues as to what changes should be brought in various Energy Education programmes. Energy Education means social benefits for women and children who are the main beneficiaries of newer technologies of non-conventional energy. This correlation may also help in developing better understanding of the course curricula to make more concerted efforts for improved attitude of qualified teachers. The factors of

teacher's attitude explained above and their personality characteristics assumed to be underlying the relationship may be supported on the basis of experiences of the investigator. With the personal contacts and general feed back given prior to the study, the investigator felt that this might be true. Thus, selection of topic for present study appears to be quite justified.

### **OBJECTIVES OF THE STUDY**

This study was based on the following objectives:

1. To compare the attitude of urban and rural teachers towards Energy Education.
2. To compare the attitude of male and female teachers towards Energy Education.
3. To compare the attitude of Arts, Science and Commerce teachers towards Energy Education.
4. To compare the attitude of General, O.B.C. and SC/ST teachers towards Energy Education.
5. To compare the attitude of teachers of different economic status towards Energy Education.
6. To compare the attitude of teachers with different age groups towards Energy Education.
7. To compare the attitude of teachers with different academic qualifications towards Energy Education.
8. To analyse the extent of relationship between attitude towards Energy Education and personality characteristics of teachers.

### **HYPOTHESES OF THE STUDY**

For the study, above objectives were translated into null hypothesis forms which are described below:

1. There is no significant difference between attitudes of rural and urban teachers towards Energy Education.
2. There is no significant difference between attitudes of male and female teachers towards Energy Education.
3. There is no significant difference in the attitudes of Arts, Science and Commerce teachers towards Energy Education.
4. There is no significant difference in the attitudes of General, OBC and SC/ST teachers towards Energy Education.
5. There is no significant difference in the attitudes of teachers of different economic status towards Energy Education.
6. There is no significant difference in the attitudes of teachers of different age groups towards Energy Education.
7. There is no significant difference in the attitudes of teachers of different academic qualification towards Energy Education.
8. There is no significant relationship between attitude towards Energy Education and personality characteristics of teachers.

## **DEFINITIONS OF IMPORTANT TERMS**

### **CONCEPT OF ATTITUDE**

Attitudes are the effective by-products of an individual's experience which have their basis in his inner urges, acquired habits and the environmental influences surrounding him. They actually form part of an individual's own personality but are affected by the attitudes and behaviour of the group or groups with which he associates. The Information from attempts to measure the attitude or belief of an individual is known as opinionative or attitude scale. Researcher may infer or estimate attitudes by responses to preset questionnaire. This process of inferring attitude from expressed opinion has many limitations. People may conceal their attitudes and express socially acceptable opinions; more so, behaviour itself is not always a true indicator.

In this study, the investigator constructed attitude scale for measuring attitude of the teachers of secondary schools of Devi Patan Region towards Energy Education. Likert method of attitude scaling was adopted which was chosen due to easy scaling and clarity of attitude model.

### **CONCEPT OF PERSONALITY CHARACTERISTICS**

The dimension on "Personality Characteristics" is used, in the study; in terms of needs, this investigation considered 10 needs, which have been mentioned below:

1. Need Achievement (n-ach.): Need to overcome obstacles.
2. Need Exhibition (n-exh.): Need to attract attention to oneself
3. Need Autonomy (n-aut.): Need to resist influence or coercion.
4. Need Affiliation (n-aff.): Need to form friendship and associations.
5. Need Succourance (n-succ.): Need to seek aid, protection or sympathy.
6. Need Dominance (n-dom.): Need to control others.
7. Need Abasement (n-aba.): Need to surrender.
8. Need Nurturance (n-nur.): Need to nourish and protect helpless others.
9. Need Endurance (n-end.): Need to desire to work continuously.
10. Need Aggression (n-agg.): Need to assault or injure others.

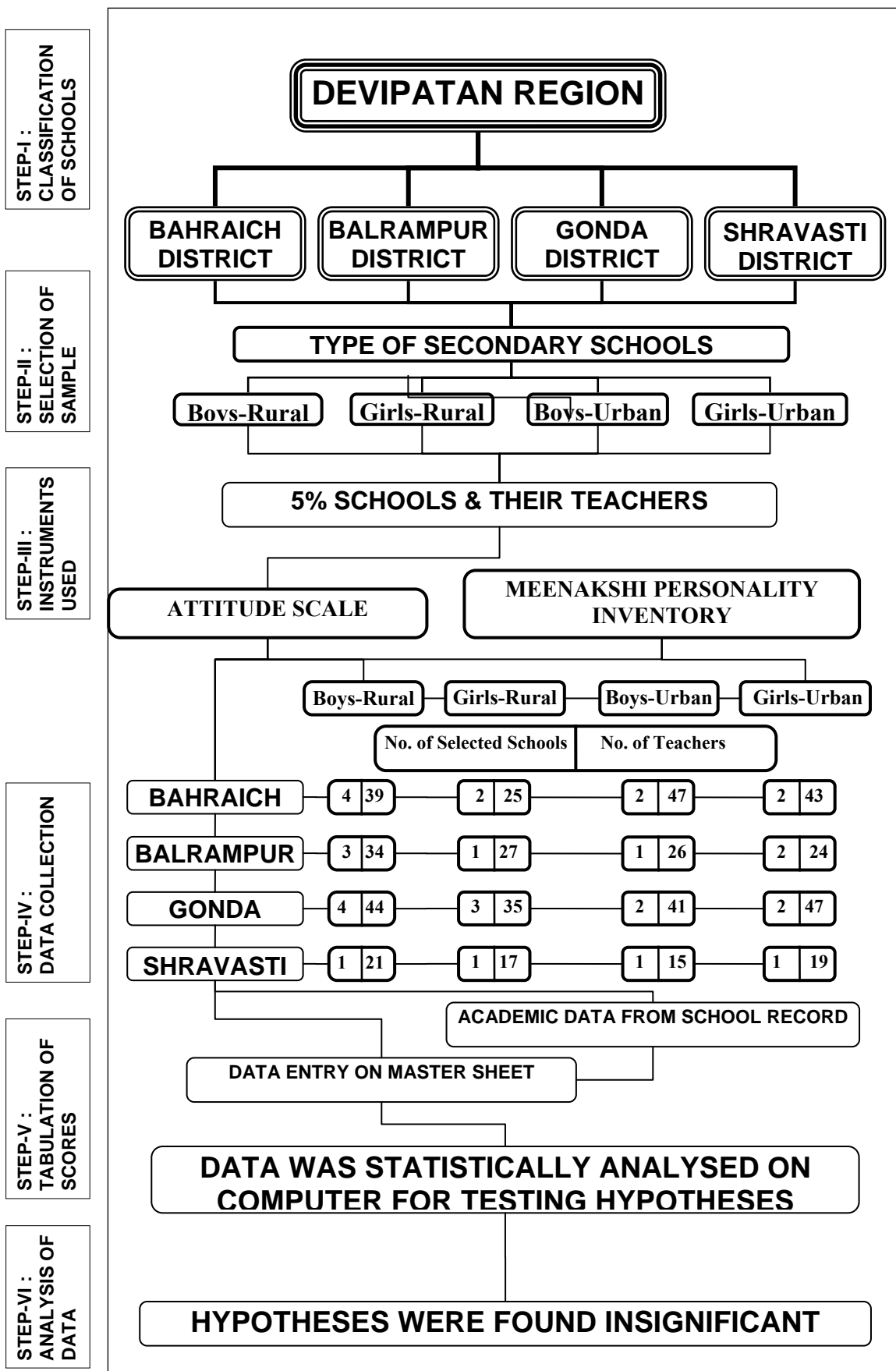
## **METHODS AND PROCEDURE OF THE STUDY**

The study was conducted in scientific manner with careful planning and logical designing. It was planned in six steps i.e. I to VI as per following Study Design in which subjects were selected, tools were administered, Data was analysed and finally hypotheses were tested for significance. The results were then summarized and graphically represented.

For this investigation Likert type attitude scale was constructed. This scale was adopted as it was time saving and easier to construct. Here respondent was not simply asked whether he/she agree or disagree with an item but one rather chooses from a response category range indicating degree of agreement and disagreement to the statement.



# STUDY DESIGN



In the present study data was collected randomly from various secondary schools of Devi Patan Region (Uttar Pradesh) India. A number of statements were prepared and only 50 statements with highest discriminative value were included in the attitude scale. For each statement, percentage of 'Strongly Agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly Disagree' attitudes was calculated to know the positive or negative attitude of teachers. Academic qualification is the indicator of the level of teachers' substantial knowledge. It refers to the cognitive and non-cognitive aspects of learning. To obtain the index of academic qualification of the teachers, weightage were given to their Academic qualification and divisions secured in the final academic examinations as discussed earlier. Meenakshi personality inventory was used to measure personality needs. The "personality need" is defined as a "hypothetical inner force" manifested in the behaviour of the individual. The inventory was designed to measure ten such needs. Each of these needs was designed to be measured through a "10-items" scale.

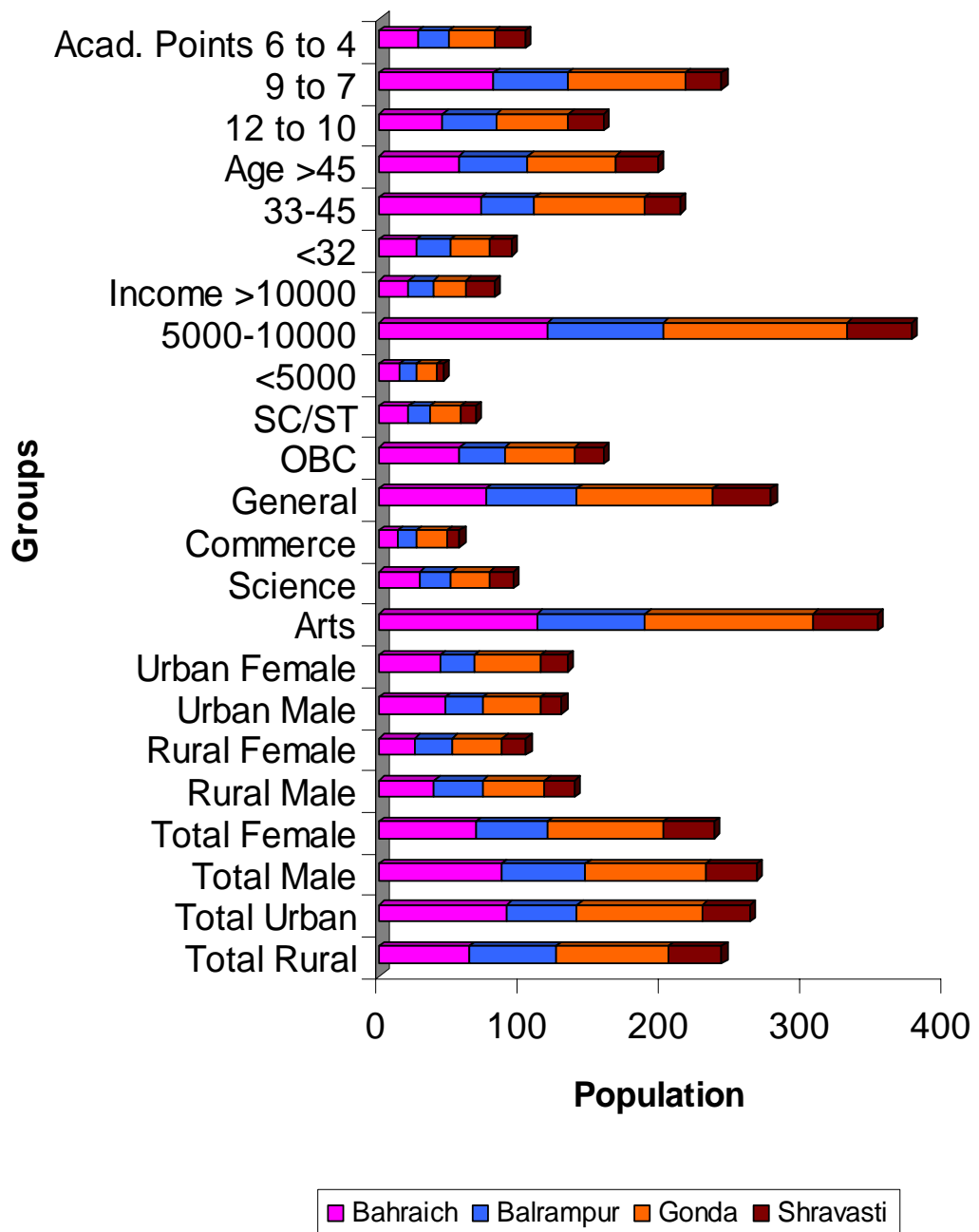
### **THE POPULATION**

Population for the purpose of this study was defined as all teachers of all secondary schools of Devi Patan Region (U.P.) INDIA. In this region, there were four districts namely, Bahraich, Balrampur, Gonda and Shravasti. A list of these schools was obtained from concerned District Inspector of Schools (D.I.O.S.) office.

#### **DISTRICT / GROUPWISE DISTRIBUTION OF THE SAMPLED POPULATION**

| Group                   |          | District         |           |       |           | TOTAL |
|-------------------------|----------|------------------|-----------|-------|-----------|-------|
|                         |          | BAHRAICH         | BALRAMPUR | GONDA | SHRAVASTI |       |
|                         |          | Total Population |           |       |           |       |
|                         |          | 154              | 111       | 167   | 72        |       |
|                         |          | Group Population |           |       |           |       |
| Area                    | Rural    | 64               | 61        | 79    | 38        | 242   |
|                         | Urban    | 90               | 50        | 88    | 34        | 262   |
| Sex                     | Male     | 86               | 60        | 85    | 36        | 267   |
|                         | Female   | 68               | 51        | 82    | 36        | 237   |
| Rural Population        | Male     | 39               | 34        | 44    | 21        | 138   |
|                         | Female   | 25               | 27        | 35    | 17        | 104   |
| Urban Population        | Male     | 47               | 26        | 41    | 15        | 129   |
|                         | Female   | 43               | 24        | 47    | 19        | 133   |
| Stream                  | Arts     | 112              | 76        | 118   | 46        | 352   |
|                         | Science  | 29               | 22        | 27    | 17        | 95    |
|                         | Commerce | 13               | 13        | 22    | 9         | 57    |
| Category                | General  | 76               | 64        | 96    | 41        | 277   |
|                         | OBC      | 57               | 32        | 49    | 21        | 159   |
|                         | SC/ST    | 21               | 15        | 22    | 10        | 68    |
| Monthly Income (Rs.)    | <5000    | 14               | 12        | 15    | 5         | 46    |
|                         | 5-10000  | 119              | 82        | 129   | 46        | 376   |
|                         | >10000   | 21               | 17        | 23    | 21        | 82    |
| Age (Years)             | <32      | 26               | 24        | 28    | 16        | 94    |
|                         | 33-45    | 72               | 38        | 77    | 26        | 213   |
|                         | >45      | 56               | 49        | 62    | 30        | 197   |
| Academic Qual. (Points) | 10-12    | 45               | 38        | 51    | 25        | 159   |
|                         | 7-9      | 81               | 52        | 83    | 26        | 242   |
|                         | 4-6      | 28               | 21        | 33    | 21        | 103   |

## DISTRICT WISE DISTRIBUTION OF THE SAMPLED POPULATION OF DIFFERENT GROUPS



### **THE SAMPLE**

Sampling in the present study was stratified random sampling. This method of selection is called random, where the investigator had selected the sample from the secondary schools teachers' population of Devi Patan Region (U.P.) The unit of the sampling was school whose total population was 640, out of this it was decided to select 5% of schools from all four districts of Devi Patan Region. Hence, in present sample of 32 schools 19 were boys and 13 girls; 21 were rural and 11 were urban schools. After selecting the sample of schools all the teachers in that particular school constituted subjects for proposed study. Thus Two-stage sampling procedure was adopted. In the first stage, schools were selected through stratified random sampling and in the second stage all the teachers in the selected schools who were present at the time of data collection were include in the sample.

### **VARIABLE INVOLVED**

The following variables were involved in this study:

1. Teacher's attitude
2. Academic qualification of the teachers
3. Personality characteristics of the teachers

### **TOOLS USED**

The data was collected from the sample by the following tools:

1. Attitude Scale towards Energy Education
2. Meenakshi Personality Inventory
3. Other information about teachers from office records.

### **COLLECTION OF DATA**

The attitude scale and Meenakshi Personality Inventory were administered on 504 teachers of 32 schools and data was collected. Information about Academic qualification was taken from school's office. All tools were administered simultaneously on same day in same school to all teachers.

### **TABULATION AND PREPARATION OF MASTER-SHEET**

After collecting data of all tools, score for each variable and for all teachers were tabulated on a Master-Sheet. It flowed from this table that majority of teachers had positive or favourable attitude towards Energy Education. Very few teachers had negative and undecided attitude.

### **STATISTICAL TECHNIQUES USED**

In the present study, in order to achieve the objectives and to test hypotheses the statistical techniques were used in following manner: Firstly, Mean and S.D. were calculated for each variable such as age, sex, category, stream, qualification etc. After that critical Ratio (t-value) was calculated for each pair to know significant difference.

### **RESULTS**

While comparing rural and urban teachers it is always believed that the former belong to lower socio-economic status. Despite this, rural teachers were not found inferior than their urban colleagues on general mental ability, educational aspiration etc. On some fronts urban teachers had edge over

rural like facilities in schools, better transportation, electricity. Although, rural teachers had the benefit of more cohesive social structure, less wastage of time in miscellaneous activities, better emotional support of friends and peers etc. These attributes mutually counter balanced. As a result, no overall significant difference was found. This study also revealed that similar family, cultural and socio-economic background of male and female teachers played vital role in their vocational development and thus their attitudes were also similar.

Commerce teachers had economical and commercial orientation so they got a fair idea about economics of non-conventional resources of energy and that the use of non-conventional resources of energy is commercially cheapest and the best. I.Q. is approximately same for teachers of different streams such as Science, Arts and Commerce. Therefore, they have clear concept of present energy problem and their level of reasoning and thinking is same.

Teachers of General, Other Backward Classes (OBC), Scheduled Castes & Scheduled Tribes (SC/ST) categories differ on many psychological characteristics. As the lower economic status is not restricted to any of these categories it reveals that there is a general socio-cultural milieu that pervades all over the Devi Patan Region. This study also revealed that similar family, cultural and socio-economic background of teachers played a vital role in their vocational development and thus their attitudes were also similar. The scores across income and age groups were also similar.

Typically, in this region teaching is largely inherited as family profession. Devi Patan Region is very close and progressive, known for awareness of its society in general and its teachers in particular. During the survey it was found that academic scores of teachers were rarely reflected in their awareness towards non-conventional energy resources and Energy Education. They acquired this awareness while in schooling age and subsequent education enhanced their knowledge only. Attitude once formed in teenage remained unchanged in later life and to strengthen this attitude no specialized education was required. The entire population of study was common secondary school teachers who taught general subject viz. Hindi, English, Science, Commerce, Geography, Social Science, Mathematics etc. None of them were specialist in Energy Education, although they had working knowledge about energy, its uses and energy crisis. As the teachers got their education in similar institutions and were trained in government teachers training colleges, their family status has not affected their attitude.

Need Achievement, Need Exhibition, Need Autonomy, Need Affiliation, Need Succourance, Need Dominance, Need Abasement, Need Nurturance, Need Endurance and Need Aggression were not found related to the attitude. The need profile of the teachers having high attitude and low attitude is almost the same. There was insignificant difference attributable to certain inherent job related qualities like guidance, nurturance, hard work, patience, affection, leadership, autonomy, impressive personality and success.

All teachers favoured that they can play a significant role in the conservation of various forms of energy such as electricity, fire-wood, petrol,

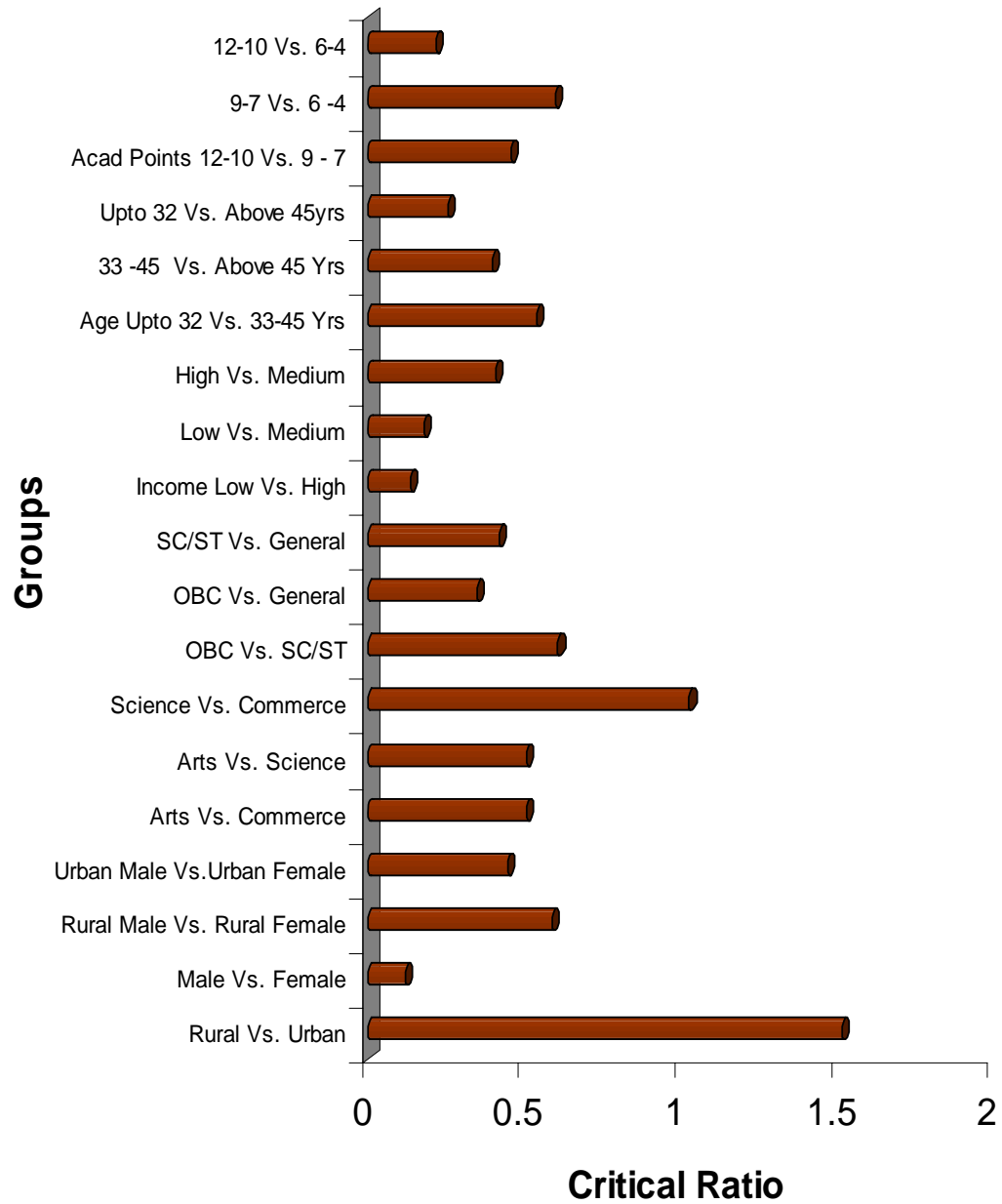
etc. For this they wanted to know more about non-conventional energy resources and also wanted to educate their students about it.

On careful scrutiny it is found that all teachers cutting across their academic, economic, educational, and social background have largely accepted the importance of Energy Education. Hence, the findings have revealed that 96% teachers had positive attitude towards Energy Education.

**DIFFERENCE IN ATTITUDE SCORES OF DIFFERENT GROUPS**

| Group                |              | Popn. | Mean   | S.D.     | C.R.    | Level of Significance               |
|----------------------|--------------|-------|--------|----------|---------|-------------------------------------|
|                      |              | N     | M      | $\sigma$ | t-value |                                     |
| Area                 | Rural        | 242   | 201.40 | 14.90    | 1.52    | Not significant at 0.05 alpha level |
|                      | Urban        | 262   | 203.26 | 12.43    |         |                                     |
| Sex                  | Male         | 267   | 202.43 | 15.33    | 0.12    | Not significant at 0.05 alpha level |
|                      | Female       | 237   | 202.29 | 13.35    |         |                                     |
|                      | Rural Male   | 138   | 201.88 | 14.75    | 0.59    | Not significant at 0.05 alpha level |
|                      | Rural Female | 104   | 200.76 | 14.49    |         |                                     |
|                      | Urban Male   | 129   | 202.91 | 12.84    | 0.45    | Not significant at 0.05 alpha level |
|                      | Urban Female | 133   | 203.60 | 11.76    |         |                                     |
| Stream               | Arts         | 352   | 202.36 | 14.49    | 0.51    | Not significant at 0.05 alpha level |
|                      | Commerce     | 57    | 203.77 | 12.60    |         |                                     |
|                      | Arts         | 352   | 202.36 | 14.49    | 0.51    | Not significant at 0.05 alpha level |
|                      | Science      | 95    | 201.54 | 13.65    |         |                                     |
|                      | Science      | 95    | 201.54 | 13.65    | 1.03    | Not significant at 0.05 alpha level |
|                      | Commerce     | 57    | 203.77 | 12.60    |         |                                     |
| Social Category      | OBC          | 159   | 201.92 | 13.46    | 0.61    | Not significant at 0.05 alpha level |
|                      | SC/ST        | 68    | 203.31 | 16.72    |         |                                     |
|                      | OBC          | 159   | 201.92 | 13.46    | 0.35    | Not significant at 0.05 alpha level |
|                      | General      | 277   | 202.39 | 14.08    |         |                                     |
|                      | SC/ST        | 68    | 203.31 | 16.72    | 0.42    | Not significant at 0.05 alpha level |
|                      | General      | 277   | 202.39 | 14.08    |         |                                     |
| Economic Status      | Low          | 46    | 202.59 | 13.78    | 0.14    | Not significant at 0.05 alpha level |
|                      | High         | 82    | 202.95 | 14.90    |         |                                     |
|                      | Low          | 46    | 202.59 | 13.78    | 0.18    | Not significant at 0.05 alpha level |
|                      | Medium       | 376   | 202.21 | 14.33    |         |                                     |
|                      | High         | 82    | 202.95 | 14.90    | 0.41    | Not significant at 0.05 alpha level |
|                      | Medium       | 376   | 202.21 | 14.33    |         |                                     |
| Age                  | Upto 32yrs   | 94    | 201.71 | 17.07    | 0.54    | Not significant at 0.05 alpha level |
|                      | 33-45 years  | 213   | 202.77 | 13.07    |         |                                     |
|                      | 33 -45 yrs   | 213   | 202.77 | 13.07    | 0.40    | Not significant at 0.05 alpha level |
|                      | Above 45yrs  | 197   | 202.23 | 14.13    |         |                                     |
|                      | Upto 32 yrs  | 94    | 201.71 | 17.07    | 0.26    | Not significant at 0.05 alpha level |
|                      | Above 45yrs  | 197   | 202.23 | 14.13    |         |                                     |
| Academic Achievement | High         | 159   | 202.60 | 13.27    | 0.46    | Not significant at 0.05 alpha level |
|                      | Medium       | 242   | 201.95 | 14.77    |         |                                     |
|                      | Medium       | 242   | 201.95 | 14.77    | 0.60    | Not significant at 0.05 alpha level |
|                      | Low          | 103   | 202.99 | 14.62    |         |                                     |
|                      | High         | 159   | 202.60 | 13.27    | 0.22    | Not significant at 0.05 alpha level |
|                      | Low          | 103   | 202.99 | 14.62    |         |                                     |

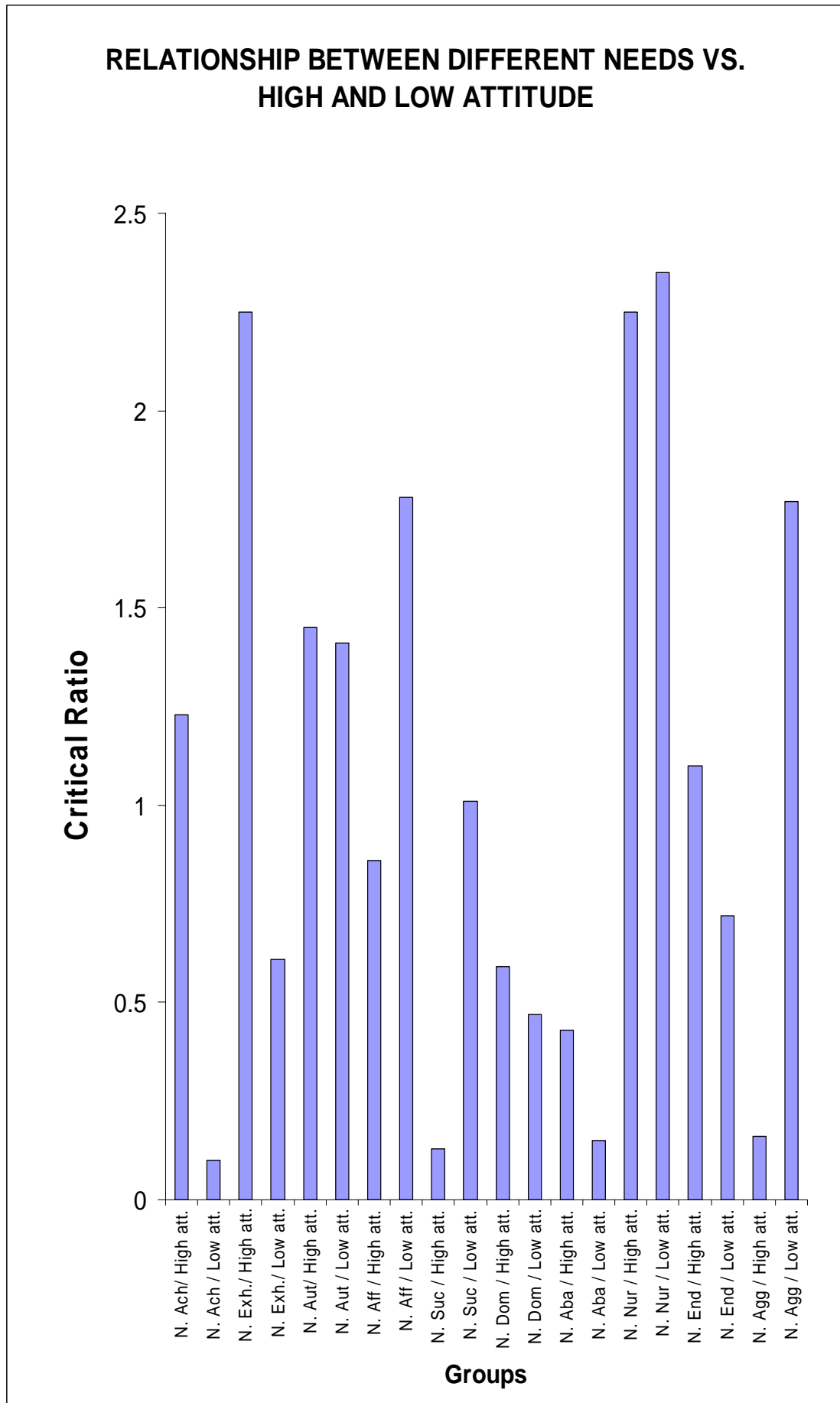
## DIFFERENCE IN ATTITUDE SCORES OF DIFFERENT GROUPS



**RELATIONSHIP BETWEEN DIFFERENT NEEDS**  
**WITH HIGH AND LOW ATTITUDE**

| Group            | Popn | Mean  | S.D.     | C.R.    | Level of Significance               |
|------------------|------|-------|----------|---------|-------------------------------------|
|                  | N    | M     | $\sigma$ | t-value |                                     |
| Need Achievement | 504  | 11.09 | 1.65     | 1.23    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 11.26 | 1.58     |         |                                     |
| Need Achievement | 504  | 11.09 | 1.65     | 0.10    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 11.07 | 1.81     |         |                                     |
| Need Exhibition  | 504  | 7.67  | 1.78     | 2.25    | Not significant at 0.01 alpha level |
| High Attitude    | 168  | 7.99  | 1.57     |         |                                     |
| Need Exhibition  | 504  | 7.67  | 1.78     | 0.61    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 7.58  | 1.55     |         |                                     |
| Need Autonomy    | 504  | 9.81  | 1.48     | 1.45    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 10.00 | 1.46     |         |                                     |
| Need Autonomy    | 504  | 9.81  | 1.48     | 1.41    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 9.63  | 1.42     |         |                                     |
| Need Affiliation | 504  | 9.27  | 1.47     | 0.86    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 9.15  | 1.61     |         |                                     |
| Need Affiliation | 504  | 9.27  | 1.47     | 1.78    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 9.51  | 1.54     |         |                                     |
| Need Succourance | 504  | 8.25  | 1.34     | 0.13    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 8.26  | 1.41     |         |                                     |
| Need Succourance | 504  | 8.25  | 1.34     | 1.01    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 8.37  | 1.39     |         |                                     |
| Need Dominance   | 504  | 9.45  | 1.36     | 0.59    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 9.52  | 1.38     |         |                                     |
| Need Dominance   | 504  | 9.45  | 1.36     | 0.47    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 9.39  | 1.45     |         |                                     |
| Need Abasement   | 504  | 10.02 | 1.44     | 0.43    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 10.07 | 1.39     |         |                                     |
| Need Abasement   | 504  | 10.02 | 1.44     | 0.15    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 9.93  | 1.39     |         |                                     |
| Need Nurturance  | 504  | 11.51 | 1.58     | 2.25    | Not significant at 0.01 alpha level |
| High Attitude    | 168  | 11.19 | 1.48     |         |                                     |
| Need Nurturance  | 504  | 11.51 | 1.58     | 2.35    | Not significant at 0.01 alpha level |
| Low Attitude     | 168  | 11.52 | 1.65     |         |                                     |
| Need Endurance   | 504  | 10.90 | 1.66     | 1.10    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 10.75 | 1.45     |         |                                     |
| Need Endurance   | 504  | 10.90 | 1.66     | 0.72    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 11.00 | 1.58     |         |                                     |
| Need Aggression  | 504  | 8.05  | 1.93     | 0.16    | Not significant at 0.05 alpha level |
| High Attitude    | 168  | 8.03  | 1.65     |         |                                     |
| Need Aggression  | 504  | 8.05  | 1.93     | 1.77    | Not significant at 0.05 alpha level |
| Low Attitude     | 168  | 8.27  | 1.11     |         |                                     |





## **FINDINGS OF THE STUDY**

The problem as stated earlier was “an attempt will be made to investigate the attitude and some factors influencing the attitudes of secondary school teachers of Devi Patan Region (U.P.) towards Energy Education.” On the basis of these hypotheses, findings of the study were summarized as mentioned on following page.

1. There was no significant difference between attitudes of rural and urban teachers towards Energy Education.
2. There was no significant difference between attitudes of male and female teachers towards Energy Education.
3. There was no significant difference in the attitudes of Arts, Science and Commerce teachers towards Energy Education.
4. There was no significant difference in the attitudes of General, O.B.C. and SC/ST teachers towards Energy Education.
5. There was no significant difference in the attitudes of teachers of different economic status towards Energy Education.
6. There was no significant difference in the attitudes of teachers of different age groups towards Energy Education.
7. There was no significant difference in the attitudes of teachers of different academic qualification towards Energy Education.
8. There was no significant relationship between attitude towards Energy Education and personality characteristics of teachers.

Thus, we see from the foregoing that the various factors like age, academic qualifications, background, diverse streams, economic status, gender, personality characteristics and social status have been studied with reference to the attitude towards Energy Education. It is thus established that these factors have no significant influence on attitude of teachers.

Hence, the study comes out that some factors influencing, attitudes towards Energy Education and its relationship with academic qualifications and personality characteristics of Secondary School Teachers in Devi Patan Region (Uttar Pradesh) is highly insignificant at 0.05 and 0.01 alpha level.

So it can be said that all Null Hypotheses for of these sub-groups were retained. The findings of the present study will apply only to the secondary school teachers of Devi Patan Region (Uttar Pradesh).

## **IMPLICATIONS OF FINDINGS**

On the basis of results and interpretation following findings have been drawn:

1. It is necessary to include Energy Education concepts in the curriculum.
2. Attitude of teachers had shown that Energy Education and non-conventional resources of energy shall be helpful in combating energy crisis and poverty to be economically and politically strong.
3. Teachers favoured that only through Energy Education people will understand the need and importance of non-conventional energy.

4. They accepted that the availability of common resources of energy such as coal, petroleum products, electricity, petrol, diesel, kerosene oil and wood etc. is decreasing rapidly with the development of civilization.
5. It revealed that teachers were aware of Energy Education and they wanted it as a compulsory subject in curriculum of High School like Science, Maths, Biology, Social Studies and Home Science etc.
6. Mostly teachers were aware about modern equipments of energy such as solar cooker, solar water heater, and solar drier etc. They also wanted that these instruments should be used in rural areas besides cities.
7. Approximately all teachers accepted the fact that information about production, conservation, utilization and management of energy besides knowledge of economical energy usage can be gathered through lectures on Energy Education, so it should be arranged in schools by experts.
8. Mostly teachers were aware that energy is fundamental factor for survival and its rational use and management is of vital importance.
9. Teachers were conscious of the fact that solar radio and solar television are effective tools and can prove significant means for imparting education to the people in remote villages.
10. Consensus was on that the misuse of petrol, wood, firewood, electricity etc. is the main cause of the crisis of conventional energy resources. All teachers had favoured that they can play a significant role in the conservation of various forms of energy. Careful and Economic use of conventional energy is very essential for energy conservation.
11. Government should install biogas plants in villages where ample cow-dung is available; it is also responsibility of the government to arrange smokeless stoves in rural area.
12. Energy Education could be furthermore useful and effective if imparted in rural India as majority population is rural and uneducated.
13. Majority of teachers wanted that Energy Education and knowledge of non-conventional resources of energy should be imparted to students through various co-curricular activities such as debates, drama, audio-visual aids etc. related to energy environment which may be easily organised by energy clubs.
14. They agreed through Energy Education masses can be awakened for appropriate use of energy resources to accelerate developmental pace of the country and wanted to strengthen our country socially, economically and politically by paying special attention to Energy Education and wide publicity of new inventions of alternative sources of energy.

### **LIMITATIONS OF THE STUDY**

Limitations are everywhere, be it a study or an experiment but the magnitude of these limitations is more in experimental studies than in theoretical analysis. The investigator was well aware of the limitations of the present study. Therefore, it was essential on the part of the investigator to explain these limitations. Some of these are mentioned below in brief:

1. This investigation was proposed to be done on all teachers, but due to lack of time and resources it has been conducted only of secondary Schools of Devi Patan Region (U. P.) and their teachers.
2. This investigation could cover only 32 secondary schools and their 504 teachers as sample.
3. Only a small sample of teachers from rural and urban areas was taken.
4. The investigator was only concerned with attitudes of teachers and has not taken into consideration their opinion about Energy Education.
5. Attitude of teachers of Degree Colleges, Post Graduate Colleges, Primary Schools, Professional Schools and other Colleges / Institutions was not taken into account. Thus, results cannot be generalised.
6. The tools used were not free from limitations. Attitudes were measured by a self-made questionnaire and checklist, which is not standardised.
7. Personality for the purpose of this study has been considered same as defined by Murray, although the investigator could measure only ten needs as per Meenakshi Personality Inventory.
8. Intelligence, an important variable was excluded from this investigation.
9. Job satisfaction was also not included in this investigation.
10. Alienation towards teaching profession, a paramount important variable is a subject for separate study, hence was not included in this study.
11. Teaching experience was also excluded from investigation.
12. Teachers training, which is also form an important aspect of teachers' attitude was excluded from this investigation.
13. Marital status and family size of teachers were not considered.
14. All the variables were studied separately. To widen the scope of investigation it is necessary to study all these variables collectively as a teacher has inter-relationship among them.

### **SUGGESTIONS FOR FURTHER RESEARCH**

An outline of suggestions for further researches is following:

1. Further studies should be done on instruction, methods and curriculum contents. So, more studies are required to be done on Energy Education.
2. Study may be designed to investigate attitude and opinions of teachers.
3. A similar study may be designed with the attitude of the teachers of other schools, colleges and universities to generalise these results
4. Another similar study may be designed to investigate the attitude, influencing other factors such as intelligence, job satisfaction and alienation towards teaching profession etc.
5. Teaching experience, teachers training, marital status and family size etc are also important variables to measure attitudes, so a study should be designed to study these factors.
6. Personality for the purpose of this study has been defined by Murray. But the investigator has only studied Ten Needs as per Meenakshi Personality Inventory. Similar study may be conducted using other tools of personality characteristics.

7. Similar study may be conducted with the inter-relationship among these variables because it is necessary to widen the scope of our investigation.
8. Similarly, a study may be designed to study the attitude of students of different streams of subjects and different levels of education such as high school, intermediate, graduation, post graduation and professional.
9. A comparative study may be designed to investigate the attitude influencing other factors such as sex, location, age, family size, family background, behaviour, academic achievement, intelligence and socio-economic status of students.
10. A comparative study may be designed to study the attitude of parents and factors influencing their attitude towards Energy Education with psychological analysis.
11. Comparative study may be designed to investigate correlation of student's attitude and some other variables such as personality, socio-economic status, behaviour and their educational & vocational planning.
12. Other designs of statistical techniques may also be considered to study influence and relationship to attitude with other factors.
13. Besides teachers and students some important persons also affect our country and daily life and can play an important role in solving such type of problems such as politicians, social workers, press reporters etc. So, a study may be designed to investigate their attitude and factors affecting attitude towards Energy Education.
14. Study may be designed to investigate attitude of illiterate rural people by interview method towards non-conventional resources of energy.
15. Study may be designed to investigate relationship of attitude of housewives and working women with some other variables such as their age, qualifications, family background, SES and personality etc.

Towards the end, in the interaction with the studied population certain areas emerged which need immediate attention by government, media, society, schools, teachers, students and their parents. Certain areas which require elaborate study were also identified. Accordingly, for rapid development of non-conventional energy resources and success of Energy Education programmes following suggestions are mentioned:

1. Grants should be given by the Government to institutions to encourage them provide Energy Education.
2. Educationists should organise various programmes on Energy Education so that they are better run.
3. Energy Education programmes and Energy policy must confirm to other related policies like population, pollution, human settlement etc.
4. The department of Energy and U.G.C. should immediately undertake preparation of suitable material and books for Energy Education.
5. Programmes suitable for non-school going children and drop-out children should also be developed.
6. Government must established centres for non formal energy education (Urja Kendra) in urban and rural areas.

7. Poster campaigns & exhibitions for mass awareness must be launched by the government and NGOs.
8. Media must educate people about non-conventional resources of energy and Energy Education and to have better attitudes.
9. There is a need to educate the public policy makers, the financial professionals, and the general public.
10. Development of educational materials, short courses, seminars, and the like, to educate the public policy makers, and financial professionals who are extremely important to increase the use of alternate energy.
11. School children must be educated about the intimate relationship of solar energy use and clean environment to create a positive atmosphere for the future use of non-conventional energy resources.
12. There is a great deal of alternate energy educational materials that has been developed in different parts of the world. Advanced information technologies can be used to compile and make this material available throughout the world by use of internet and information technology.

Finally, it is expected that this study may help to improve and enrich research in the area of Energy Education and its relationship with other variables. The world is now moving towards a sustainable energy future with emphasis on energy efficiency and use of renewable energy sources. A finite planet cannot support infinitely increasing consumption of resources and hence the motto of present times must be to "REDUCE, REUSE, RECYCLE", for which Energy Education is must so that even the remotest population is aware of the dimensions of the problem, consequences and measures to tackle it.