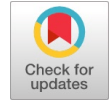


# Impact of Energy and Environmental Management Training Programme on Technical Teachers



M. Senthil Kumar

**Abstract:** Teaching is a noble profession. Training is needed for all the professionals. For teachers, lifelong training is needed to update their knowledge to deliver the content to the students. Good teachers are the important resources for educational institutions. Teacher training and professional development are the most necessary factors for the technical teaching career. Many types of training programmes are available for technical teachers. Induction training programme and in-service training programmes are important for technical teachers. Now a days, the in-service training programmes include the skill based practical training in addition to theoretical training. In this paper, the in-service training programme particularly faculty development programme in Energy & Environmental Management was considered and analysed the knowledge improvement of the teachers by conducted pretest and post test evaluation.

**Keywords:** Training programme, Energy, Environment, Pretest, Post test, Technical Teacher

## I. INTRODUCTION

Training is necessary for all the technical teachers in the domains of Cognitive, affective and psychomotor. Education means going ahead from inside. Inside indicates mental traits, mental aptitudes and impulses. The change of behaviour from the previous behaviour is named as learning. If one is really learning one's behaviour becomes more effective. Teaching is a catalytic process for bringing about desirable changes in learners [1]. In theoretical training, more behaviour changes in cognitive domain. In the practical training, more behaviour changes in affective and psychomotor domains. But in the technical teachers training, the training involves both theory as well as practical, more behaviour changes in all the three domains.

In this study we conducted the pretest before starting the programme and conducted the programme and finally conducted the post test and analyse the improvement of the different type of trainees

## II. TRAINING AND TRAINING METHODOLOGY

### Training Methodology Objectives:

- To develop the skills required to analyse
- To plan and organize the training to instruct skills and related knowledge
- To provide experiences in the application of different methods of instructions
- To develop the abilities required for evaluating the trainee performance
- To encourage the development of simple inexpensive training aids and use them based on the actual learning requirements
- To develop an understanding about the professional values and capabilities of a teacher

## III. TRAINING PROGRAMME

### A. Type of Training Programme

The training programme is "Energy and Environmental Management". It is the in-service training programme for technical teachers also called faculty development programme in content area. The programme was conducted by the Department of Mechanical Engineering, National Institute of Technical Teachers Training & Research, Chennai from 17.06.2019 to 21.06.2019(Five days). The training was given to all the participants in the form of lecture, demonstration, discussion and practical sessions by the internal and external experts including field visit

### B. Type of Participants

In this training programme, the attended participants are the teachers from engineering colleges and polytechnic institutions from Tamil Nadu, Karnataka and Telangana states. Total number of participants attended the programme is 27. The following tables indicate the details of participants.

**Table.1. State wise participants**

State	TN	KS	TS	Total
No. of Participants from Polytechnics	----	16	3	19

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No. of Participants from Engineering Colleges	8	----	----	8
Grand Total				27

(TN: Tamilnadu, KS: Karnataka state, TS: Telangana state)

**Table. 2. Gender wise participants**

State	Male	Female	Total
No. of Participants from Polytechnics	12	7	19
No. of Participants from Engineering Colleges	7	1	8
Grand Total			27

## C. Various Methods of Training [2][3]

The following methods of training were involved in this training programme

- Class Room Method
- Demonstration Method
- Discussion Method
- Lab Centered Practices
- Field Visit

## IV. AREAS OF TRAINING

The following energy and environmental management areas were covered during the training period [4].

- **Energy Sources & Power plants:** Renewable and Non renewable energy sources, Basics of energy, energy conversion system, fossil fuels, thermal power plant, hydroelectric power plant, diesel power plant, prime movers and power plants run by renewable energy sources.
- **Solar Energy Applications:** Solar radiation, types, global radiation, diffused radiation, solar water collectors, solar steam generation, solar space heating, solar space cooling, solar thermal electric conversion system, solar photovoltaic systems including solar cell, solar module and solar photovoltaic panels. Various solar energy conversion systems [5][6][7].
- **Wind Energy Applications:** Wind Energy concepts, wind mill for water pumping, wind turbines, components, off shore wind turbines, Nacelle unit, and electrical generators for wind energy generation [8].
- **Bio Energy & Alternate Fuels:** Bio mass conversion systems, Gasification and Gasifiers, Bio gas generation, Bio Diesel production [9].
- **Environmental Management:** Energy and Environmental Education & Management. Types of Pollutions. Environmental aspects related to energy sector[10]
- **Practical Training:** The practical training were given to the participants in solar flat plate collector, solar thermal training system, solar PV training system and solar water pump training system are shown in the following figures 1 to 4.



**Fig.1.Solar Flat Plate Collector**



**Fig.2.Solar Thermal Training System**



**Fig.3.Solar PV Training System**



**Fig.4.Solar PV water pump Training System**

**Field Visit:** During the field visit at National Institute of Wind Energy, Chennai, Participants got more information regarding solar and wind resource assessment, water pumping wind mills, wind turbine components & working principle and solar- wind hybrid system.

## V. ANALYSIS & DISCUSSION

### A. Analysis of percentage of marks of total Participants

Total participants were 27. The percentages of marks were compared based on pretest and post test. Initially the participants got marks from minimum 36 % to maximum 96 %.

After got the training, the marks secured by the participants in between 80 % to 100 %. Due to the impact of training the marks were increased

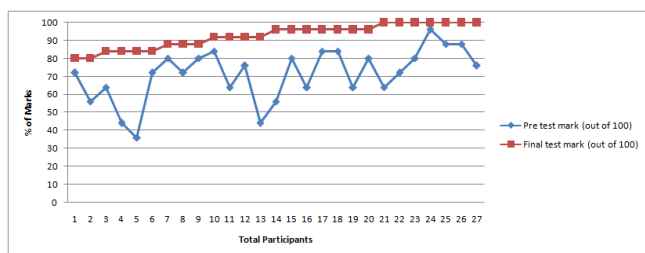


Fig.5. Pretest and Post test comparison of Total Participants

**B. Analysis of percentage of marks of Polytechnic Participants**

The polytechnic participants were 19. The percentages of marks were compared based on pretest and post test. Initially the participants got marks from minimum 36 % to maximum 88 % .After got the training, the marks secured by the participants in between 80 % to 100 %. Due to the impact of training the marks were increased

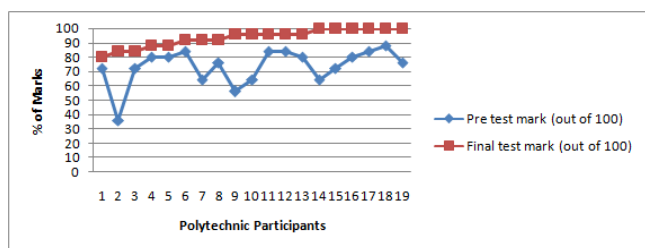


Fig.6. Pretest and Post test comparison of Polytechnic Participants

**C. Analysis of percentage of marks of Engineering college Participants**

The engineering college participants were 8. The percentages of marks were compared based on pretest and post test. Initially the participants got marks from minimum 44 % to maximum 88%.After got the training, the marks secured by the participants in between 80 % to 100 %. Due to the impact of training the marks were increased

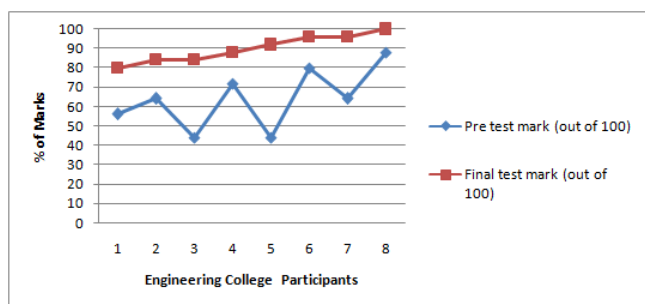


Fig.7. Pretest and Post test comparison of Engineering College Participants

**D. Analysis of percentage of marks of Male Participants**

Total male participants were 19. The percentages of marks were compared based on pretest and post test. Initially the participants got marks from minimum 36 % to maximum 88 % .After got the training, the marks secured by the

participants in between 80 % to 100 %. Due to the impact of training the marks were increased

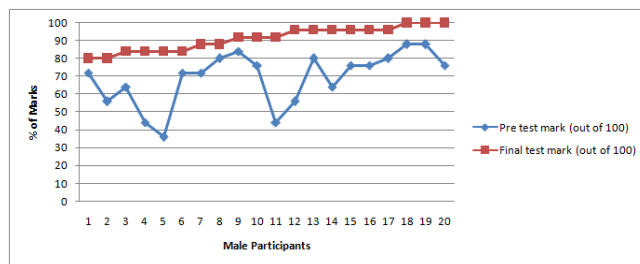


Fig.8. Pretest and Post test comparison of Male Participants

**E. Analysis of percentage of marks of Female Participants**

Total female participants were 8. The percentages of marks were compared based on pretest and post test. Initially the participants got marks from minimum 64 % to maximum 84 % .After got the training, the marks secured by the participants in between 88 % to 100 %. Due to the impact of training the marks were increased

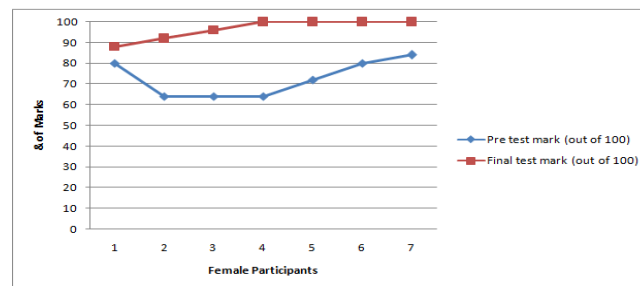


Fig.9. Pretest and Post test comparison of female Participants

**VI. CONCLUSION**

From the above study, the marks were analysed through pretest and post test and plotted in the graphs. Due to the training programme their knowledge were improved in all the domains of cognitive, affective and psychomotor. Already they are teachers having knowledge in the areas of energy and environmental management. Due to this impact of training the participants got the percentage of marks from 80% to 100%. So definitely it will reflect to their enhancement of teaching profession, finally the students will be benefitted.

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