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SPATIAL THINKING SKILLS IN MATHEMATICS: A STUDY AMONG SECONDARY SCHOOL STUDENTS

1

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National Curriculum Framework (NCF-2000) recommended that the study of mathematics contributes to the development of precision, rational and analytical thinking, reasoning, a positive attitude and aesthetic sense among the students. While considering its educational and social relevance, mathematics has considered as a compulsory subject of general education up to class X. Mathematics curriculum has undergone various changes from time to time to fulfill the goals of mathematics education. But still most of the students found this subject very difficult and un interesting. To rectify the hindrances in learning mathematics and to make the subject interesting for the students, the level of thinking skills among the students should be increased. Mathematical thinking is the mental activity involved in the abstraction and generalization of mathematical ideas. There are different types of thinking strategies needed for learning mathematics. Lateral thinking skills, convergent thinking skills, abstract thinking skills, spatial thinking skill and so on. Among these, developing spatial thinking skill is very much important because of the advancement in Science and Technology in this modern era.

Spatial thinking has been receiving increased attention in the past several years. It has a large number of applications in our day-to-day life. According to National Research Council Committee of USA (2006) "Spatial Thinking" is a constructive amalgam of three mutually reinforcing components: the concept of space, tools of representation, and processes of reasoning. Moses (1977) through his study found that mathematical performance of the students can be improved by training them on spatial tasks. Several studies have shown that spatial thinking skills are positively related to achievement in mathematics (Aiken, 1971; Battisla, 1980; Fennema and Shermon, 1977). Geddes (1993) claimed that studying geometry will develop spatial sense and provide opportunities for developing divergent thinking and creative problem solving as well as logical thinking abilities of students. Burns (1984) expressed that, appropriate geometry experiences were useful for developing reasoning processes which in turn support problem solving skills in children.

All these studies highlight the importance of spatial thinking skills in mathematics. Also spatial thinking

is recognized as a fundamental part of school curriculum due to its importance as a problem solving tool in many different disciplines especially in mathematics. Therefore, the development of spatial thinking skills in mathematics has been a primary problem for the researchers, educators and teachers for many years. So children should develop spatial thinking skills especially in terms of learning of mathematics. Before that one has to know the extent of spatial thinking skills in mathematics among children to provide proper help to develop this skill and to nurture it.

McGee (1979) classified spatial thinking skills, into two sub skills such as Spatial Visualization and Spatial Orientation.

SPATIAL VISUALIZATION

According to Mc Gee (1979) Spatial Visualization skills refers to the ability to manipulate, rotate, change the position in mind of an object depicted as a picture. The skills of Spatial Visualization contains

- Ability to imagine the rotation of a depicted object, the (un)folding of a solid, and the relative changes of position of objects in space.
- Ability to visualize a configuration in which there is movement among its parts.
- Ability to comprehend imaginary movements in three dimensions, and to manipulate objects in the imagination.
- Ability to manipulate or transform the image of a spatial pattern in to other arrangement.

SPATIAL ORIENTATION

According to Mac Gee (1979) Spatial Orientation skills refers to the

- Ability to determine relationships between different spatial objects.
- Ability to recognize the identity of an object when it is seen from different angles, or when the object is moved.
- Ability to consider spatial relations where the body orientation of the observer is essential.
- Ability to perceive spatial patterns and to compare them with each other.
- Ability to remain unconfused by the varying orientations in which a spatial object may be presented.
- Ability to perceive spatial patterns or to maintain orientation with respect to objects in space.

For the present study, the investigator selected the two sub skills of spatial thinking such as spatial visualization and spatial orientation to find out the level of spatial thinking skills among the secondary school students.

OBJECTIVES OF THE STUDY

- ★ To find out the extent of spatial thinking skills among secondary school students.
- ★ To identify the level of spatial visualization and spatial orientation skills among secondary school students.
- ★ To compare the level of spatial thinking skills among secondary school students based on the sub samples
 - a) Gender (Boy/Girl)
 - b) Locale of school (Rural/Urban)

★ To compare the level of spatial visualization and spatial orientation skills among secondary school students.

technique by giving due weightage to gender and locale of school.

Tool used

Spatial Thinking Skill test for students prepared by the investigators. The test was developed by giving due weightage to spatial thinking sub skills such as spatial visualization and spatial orientation. The test consisted of 20 multiple choice items and students are requested to choose the correct answer. Each question carries 1 mark and the total score of the test was 20. Out of which 10 questions are for assessing spatial visualization skills and the remaining are for assessing spatial orientation skills.

HYPOTHESES OF THE STUDY

1. There is no significant difference in the level of spatial thinking skills among secondary school students based on the sub sample
 - a) Gender (Boy/Girl)
 - b) Locale of school (Rural/Urban)
2. There is no significant difference in the level of spatial visualization and spatial orientation skills among secondary school students.

Descriptive Statistics

The data collected was classified, tabulated, analyzed and interpreted using various descriptive statistics such as mean, median, standard deviation, quartile deviation, kurtosis and using the inferential statistics, test of significance of difference between two means.

METHODOLOGY

Survey method was adopted for the present investigation.

Sample

A sample of 100 students from IX standard following Kerala State Syllabus of Ernakulam and Palakkad district were selected using stratified random sampling

DATA ANALYSIS AND INTERPRETATION

Table 1

Data and Results of Measures of Central Tendency, Dispersion and Kurtosis of Spatial Thinking Skills in the total sample and sub samples

Group	N	Mean	Median	SD	QD	Kurtosis
Total	100	7.86	8.39	2.65	0.505	0.027
Boys	55	7.67	7.95	2.66	2.08	0.124
Girls	45	8.09	8.56	2.64	2.43	0.127
Rural	50	9.12	9.62	2.41	2.59	0.184
Urban	50	6.60	7.43	2.26	3.38	0.235

Table 1 shows that the arithmetic mean and median of all the groups were almost the same. The mean scores of all the groups are below 50% of the total score. This clearly indicates that the existing level of spatial thinking skills of secondary school students is low. The standard deviations

of the groups indicate that the scores were not much dispersed from the central value. This shows that there were no much individual differences within the groups. The kurtosis of all the sub samples was less than the normal value 0.263. Therefore the distribution is leptokurtic.

Table 2
Significant Difference Between Mean Spatial Thinking Scores of Sub Samples Based on Gender and Locale

Category	Group	N	Mean	SD	CR
Gender	Boys	55	7.67	2.66	2.61**
	Girls	45	8.09	2.64	
Locale of School	Rural	50	9.12	2.41	5.40**
	Urban	50	6.60	2.26	

**P<0.01

The critical ratios obtained for the sub samples based on gender was 2.61 which is greater than the table value 2.58 at 0.01 level of significance. By comparing the mean spatial thinking scores of boys and girls, we can see that the mean of girls is higher than that of boys. So it can be interpreted that girls have significantly higher level of spatial thinking skills in mathematics when compared to boys. Also table 2 reveals that

t-value obtained while comparing the mean scores of students from rural and urban school is 5.40 and is significant at .01 level. The mean score of students from the rural schools is higher than that of urban school students. So it can be interpreted that rural school students have high spatial thinking skills in mathematics than their counter parts.

Table 3
Measures of Central Tendency, Dispersion and Kurtosis of Spatial Visualization and Spatial Orientation Skills

Sub Skills	N	Mean	Median	SD	QD	Kurtosis
Spatial Visualization	100	3.97	4.61	1.39	1.01	0.116
Spatial Orientation	100	3.89	4.12	1.53	1.36	0.143

Table 3 shows that the arithmetic mean and median of the two sub skills were almost the same. The mean scores of the two sub skills are below 50% of the total score. This shows that the students have a low level of spatial visualization and spatial orientation skills. The standard deviations

of the sub skills indicate that the scores were not much dispersed from the central value. This shows that there were no much individual differences within the sub skills. The kurtosis of all the sub samples was less than the normal value 0.263 therefore the distribution is leptokurtic.

Table 4

Significance of Difference Between Mean Spatial Scores of Spatial Visualization and Spatial Orientation Skills of Secondary School Leaving

Sub Skills	N	Mean	SD	CR
Spatial Visualization	100	3.97	1.40	0.39
Spatial Orientation	100	3.89	1.53	

The critical ratio obtained while comparing the level of sub skills of spatial thinking skills such as spatial visualization and spatial orientation is 0.39 which is less than the table value 1.96 at 0.05 level of significance and thus it is not significant. So we can interpret that secondary school students have the same level of spatial visualization and spatial orientation skills.

CONCLUSION AND IMPLICATIONS

The study revealed that secondary school students have a low level of spatial thinking skills. Girls are having a significantly high level of spatial thinking skills than boys and students from rural school are having a significantly high level of spatial thinking skills than students from urban schools. The level of spatial thinking sub skills such as spatial visualization and spatial orientation is same for the secondary school students.

Spatial thinking is important for success in many fields of study. Mathematics,

Natural Sciences, Engineering, Economic Forecasting, Meteorology and Architecture all involve the use of spatial skills. Formal training, however, is not the only way to develop spatial skills. Children have to train to think spatially through informal and formal way of teaching and learning. Currently spatial thinking is neglected during elementary and secondary education in our state. Therefore high school students' spatial ability levels are very low. Therefore, educators have the important job of inspiring students, the decision makers of tomorrow, to think spatially throughout their days and throughout their lives. According to Fennema and Sherman (1997) spatial visualization skill was more importantly related to mathematics achievement. Besides mathematics, spatial thinking was found to be strongly linked to achievement in science (Delialiolu, 1996; Elmore and Vasu, 1987; Tracy, 1990). So teachers have to train their students to think spatially in order to gain progress

in mathematics as well as in the other subjects. According to (Connor and Serbin, 1977; O'Brien and Huston, 1985; Serbin and Connor, 1979) boys who engage in more culturally "masculine" play perform relatively better on spatial tasks than girls. According to (Newcombe et al., 1983) through their study revealed that girls and adolescents have more spatial skills and also score relatively better on spatial tasks than boys. Teachers have to prepare spatial activities with respect to the cognitive levels of students and make the students be aware of the importance of spatial thinking skills. Curriculum developers have to synthesize

the spatial concepts in the elementary and secondary education and have to include activities in the mathematics text books of students to develop their spatial thinking skills. Awareness Programs have to be conducted in schools to make aware about the importance and practical applications of spatial thinking skills for both teachers and students. Teachers have to provide with hand books which include different methods and activities which help them to boost the level of spatial thinking skills of their students in mathematics and also in other subjects.

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THE LAISSEZ FAIRE LEADERSHIP STYLE OF HIGHER SECONDARY TEACHERS IN TAMILNADU STATE

2

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INTRODUCTION

Leadership has been described as “a process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common task”. For example, some understand a leader simply as somebody whom people follow, or as somebody who guides or directs others while others define leadership as “organizing a group of people to achieve a common goal” Studies of leadership have produced theories involving traits, situational interaction, function, behavior, power, vision, values and intelligence among others. The classroom management styles of the teachers can be readily identified on the basis of both degree of control and level of involvement. Research has shown that the type of leadership style used reflects in the characteristic behaviors. Teachers need to feel comfortable and safe in order to learn most effectively. All the educators need to manage their classrooms in such a way that they create this sort of environment. Whether you teach at preschool, elementary, high school, or college, knowledge of classroom

management plan will help in framing the rules and structure of classrooms. In this regard leadership style of a teacher is very important aspect.

All managers are having a particular style of leadership in them as teachers are also managers of every classroom there are expected to have any one of the leadership style within them. The laissez-faire leadership style helps to produce teachers who are socially competent and responsible. The laissez-faire style helps to improve teachers who are ineffective at social interaction, and somewhat inactive. Both indulgent and permissive styles help to produce teachers who are immature, showing poor understanding, poor mutual relationship, lack of give and take policy and exhibiting poor leadership style. Teachers need to feel comfortable and safe in order to learn most effectively. All the educators need to manage their classrooms in such a way that they create this sort of environment. Whether you teach at preschool, elementary, high school, or college, knowledge of classroom management plan will help in framing the rules and structure of classrooms.

OBJECTIVES OF THE STUDY

- ★ To Study the level of laissez-faire leadership style of higher secondary teachers.
- ★ To Study the significance of the difference between male and female higher secondary teachers with respect to laissez-faire leadership style.
- ★ To Study the significance of the difference between rural and urban area higher secondary teachers with respect to laissez-faire leadership style
- ★ To Study the significance of the difference between higher secondary teachers belonging to nuclear and joint family with respect to laissez-faire leadership style
- ★ To Study the significance of the difference between married and unmarried higher secondary teachers with respect to laissez-faire leadership style

HYPOTHESES OF THE STUDY

1. The level of laissez-faire leadership style of higher secondary teachers is average.
2. There is no significant difference between male and female higher secondary teachers with respect to laissez-faire leadership style.
3. There is no significant difference between rural and urban area higher secondary teachers with respect to laissez-faire leadership style.
4. There is no significant difference between higher secondary teachers belonging to nuclear and joint family with respect to laissez-faire leadership style.

5. There is no significant difference between married and unmarried higher secondary teachers with respect to laissez-faire leadership style.

METHODOLOGY

The normative survey method was adopted, it describes and interprets what exists at present.

Sample

The present study consists of 561 higher secondary teachers working in Trichy District. The sample was selected by using simple random sampling technique. The sample forms a representative sample of the entire population. Proportionate weightage was given to various sub-samples.

Tool Used

Leadership style tool was constructed and standardized by the investigator (2012). There are 30 statements in total which are divided in to three categories namely authoritarian, democratic and laissez-faire style. A pilot study was conducted and then the item analysis was also prepared from which the final tool of the study is derived. The validity and reliability of the tool were also established and verified.

STATISTICAL TECHNIQUES USED

Descriptive Analysis

Measures of central tendency (Mean)

Measures of variability (standard deviation) and

Differential Analysis

Independent sample 't' test.

Table 1

Mean, Standard Deviation and 't'-Values of Higher Secondary teachers Laissez-faire Leadership Style

S. No.	Variable	Sample	N	Mean	SD	't' value	Result
1.	Gender	Male	333	37.44	5.76	0.27	Not significant
		Female	228	37.31	5.79		
2.	Locality	Rural	209	37.61	5.64	0.72	Not significant
		Urban	352	37.25	5.85		
3.	Family Type	Nuclear	279	37.13	5.25	1.03	Not significant
		Joint	282	37.63	5.24		
4.	Marital Status	Unmarried	93	37.15	6.50	0.39	Not Significant
		Married	468	37.43	6.62		
13	Entire Sample		561	37.46	5.75		

Interpretation

Table 1 shows the following statistical information.

Level of laissez-faire leadership style

The calculated mean score of entire sample is found to be 37.46 and the standard deviation value is 5.75. It is inferred that higher secondary teachers are having average level of laissez-faire leadership.

Difference between male and female teachers

The calculated 't' value is found to be 0.27, which is not significant at 0.05 level.

Hence, it is inferred that the male and female higher secondary teachers do not differ significantly in their laissez-faire leadership style.

Difference between rural and urban area teachers

The calculated 't' value is found to be 0.72, which is not significant at 0.05 level. Hence, it is inferred that the rural and urban area higher secondary teachers do not differ significantly in their laissez-faire leadership style.

Difference between higher secondary teachers belonging to nuclear and joint family teachers

The calculated 't' value is found to be 1.03, which is not significant at 0.05 level. Hence, it is inferred that the nuclear and joint family higher secondary teachers do not differ significantly in their laissez-faire leadership style.

Difference between unmarried and married teachers

The calculated 't' value is found to be 0.39, which is not significant at 0.05 level. Hence, it is inferred that the unmarried and married higher secondary teachers do not differ significantly in their laissez-faire leadership style.

FINDINGS

- ★ The higher secondary teachers are having average level of laissez-faire leadership style.

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- ★ The male and female higher secondary teachers do not differ significantly in their laissez-faire leadership style.
- ★ The rural and urban area higher secondary teachers do not differ significantly in their laissez-faire leadership style.
- ★ The higher secondary teachers belonging to nuclear and joint family do not differ significantly in their laissez-faire leadership style.
- ★ The unmarried and married higher secondary teachers do not differ significantly in their laissez-faire leadership style.

CONCLUSION

Higher Secondary Teachers' role is a vital concept of our education. Their leadership style is one of the factors which determine their efficiency. Thus a study on their laissez-faire leadership style has been undertaken and it is found to be at average level which is a good sign in our education system.

JOB STRESSORS AND MENTAL HEALTH OF PRIMARY SCHOOL TEACHERS IN ARIYALUR DISTRICT

3

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INTRODUCTION

The teacher is the real torchbearer of the society and is the second parent of children studying in the school for fulfilling the educational needs of the children. In the educational development of a child, the role of the teacher should never be avoided. The teacher is the real dynamic force of the school. The school without out good teachers is a soulless body. Without competent and good teachers, even the best educational systems are bound to fail.

Stress is common in the world. Various researchers showed clearly that the emotional stability of teachers affected that of the students. Only a cheerful, optimistic and an extrovert teacher can teach with rigour, and create delightful atmosphere in the class. The teacher has to avoid projecting pessimism, frustration, maladjustment, complexes and prejudices. Teachers themselves should be free from these abnormal traits and has to bear the hardships of life with fortitude and patience.

Job Stressors and Mental Health

Jobs and careers are an important part of our lives. Along with providing a source of income, they help us fulfil our personal aims, build social networks, and serve our professions or communities. They are also a major source of stress. Work can provide identity, friendship, a steady routine and a salary. Some people thrive in a busy environment and enjoy working to ambitious targets, others may see their job as a means to an end.

When people feel under pressure at work it can lead to stress and their mental health is also affected. It is in the best interests of employers and employees to avoid such situation, and create good working environment that are free from all the disparities and pressurized managerial decisions. The incidence of stress is usually high for human service professionals, including teachers.

Stress describes negative feelings resulting from work that may include anger, frustration, tension and depression that threaten a professional's sense of well-being

(Kyriacou, 2001). Teaching is considered a high stress profession, where approximately one quarter of schoolteachers view teaching as extremely stressful (Kyriacou, 2001). Consequences of stress is damaging for teachers, students and the education field in general. During the school year, stress can lead to a higher frequency of absenteeism (Griffith, Steptoe and Copley, 1999) and burnout may lead teachers to retire early, leaving the profession and reducing the number of competent teachers available to teach and serve children.

Many teachers have poor or moderate mental health. When they have good mental health, their decision making power is too good and their decisions are very well opted by their followers or superiors. If a teacher has poor mental health, he or she may not be in a position not to take any immediate action over a specific problem. So, the mental health of a teacher plays very much important role in his profession.

NEED FOR THE STUDY

Though teaching is considered as a noble profession, the teachers feel it as a hard task to realise the goals set by them to certain satisfactory level. In fact, every minute is challenging for a sincere as well as committed teacher. As time changes, the skills and characteristics do change among the student communities and thereby the fresh demand for change in the mode of teaching arises to challenge the teacher in improving their skills and utilization of available resources. A good teacher can never be satisfied with what he or she has achieved in the past.

Such a challenging situation always puts the teacher in finding the ways and means for attaining such satisfaction. The job stress could also confuse or demoralize even the good teachers to deviate from their chosen path. The intensity of such job stressors could cause mental agony forcing the individuals given up the chosen profession. In such a context, one could assume that the resoluteness on the part of a teacher.

It is strongly opined that there is a necessity to identify the prominence of various job stressors and their mental health of primary school teachers. If there exists such vulnerable job stressors and poor mental health found among the primary school teachers, their teacher behaviour is too questionable. So, it is the right time to identify those things for evolving suitable strategies for overcoming job stress and improving their mental health, which resulting in the scholastic performance of their students. Hence, the investigator has planned this study.

STATEMENT OF THE PROBLEM

Job Stressors and Mental Health of Primary School Teachers in Ariyalur District

OPERATIONAL DEFINITIONS

Job Stressors

By “Job Stressors”, the investigator means the factors affecting the teachers working in primary schools in Ariyalur District. Operationally, it is the scores obtained on the Teachers’ Job Stressors Scale developed and validated by the Investigator.

Mental Health

Mental health implies the adjustment of the individual to the world and each other maximum effectiveness and happiness. By 'mental health', the investigator means the mental health status of the teachers working in different categories of schools. Operationally, it means the scores obtained on the Mental Health Checklist standardized by Pramod Kumar (1992).

OBJECTIVES

- ★ To find the prominence of job stressors of primary school teachers.
- ★ To find the nature of mental health of primary school teachers.
- ★ To find the significant difference between the male and female primary school teachers in their job stressors.
- ★ To find the significant difference

between the married and unmarried primary school teachers in their job stressors.

- ★ To find the significant difference between the male and female primary school teachers in their mental health.
- ★ To find the significant difference between the married and unmarried primary school teachers in their mental health.
- ★ To find the significant relationship between the job stressors of primary school teachers and their mental health.

DATA ANALYSIS

Null Hypothesis - 1

The prominence of job stressors of primary school teachers in Ariyalur District is not high.

Table 1
Prominence of Job Stressors of Primary school teachers

Job Stressors	Low		Moderate		High	
	N	%	N	%	N	%
Teacher Role Maintenance	2	1.18	79	46.75	88	52.07
Respect and Honour Maintenance	4	2.37	85	50.30	80	47.34
Maintenance of Interpersonal Relationship	3	1.78	80	47.34	86	50.89
Total	0	0.00	51	30.18	118	69.82

Table 1 shows that 1.18% of primary school teachers have low, 46.75% of them have moderate and 52.07% of them have high level of job stressors in teacher role maintenance.

2.37% of primary school teachers have low, 50.30% of them have moderate and 47.34% of them have high level of job stressors in respect and honour maintenance.

1.78% of primary school teachers have low, 47.34% of them have moderate and 50.89% of them have high level of job stressors in maintenance of interpersonal relationship.

None of primary school teachers have low, 30.18% of them have moderate and 69.82% of them have high level of job stressors.

Null Hypothesis – 2

The nature of mental health of primary school teachers is not good.

Table 2
Nature of Mental Health of Primary School Teachers

Variable	Poor		Moderate		Good	
	N	%	N	%	N	%
Mental Health	8	4.73	137	81.07	24	14.20

Table 2 shows that 4.73% of primary school teachers have poor, 81.07% of them have moderate and 14.20% of them have good level of mental health.

Null Hypothesis – 3

There is no significant difference between the male and female primary school teachers in their job stressors.

Table 3
Difference between Male and Female Primary School Teachers in their Job Stressors

Job Stressors	Gender	N	Mean	SD	Calculated 't' Value	Table Value	Remark
Teacher Role Maintenance	Male	104	68.58	11.06	1.12	1.96	NS*
	Female	65	66.35	13.38			
Respect and Honour Maintenance	Male	104	51.20	9.74	1.94	1.96	NS*
	Female	65	48.35	9.02			
Maintenance of Interpersonal Relationship	Male	104	36.02	8.88	1.20	1.96	NS*
	Female	65	37.66	8.51			
Total	Male	104	155.80	14.56	1.56	1.96	NS*
	Female	65	152.37	13.41			

* NS: Not Significant

It is inferred from the above table that there is no significant difference between male and female primary school teachers in teacher role maintenance, respect and honour maintenance, maintenance of interpersonal relationship, and job stressors.

Null Hypothesis – 4

There is no significant difference between the married and unmarried primary school teachers in their job stressors.

Table 4

Difference between Married and Unmarried Primary School Teachers in their Job Stressors

Job Stressors	Marital Status	N	Mean	SD	Calculated 't' Value	Table Value	Remark
Teacher Role Maintenance	Unmarried	61	67.72	10.56	0.00	1.96	NS*
	Married	108	67.72	12.81			
Respect and Honour Maintenance	Unmarried	61	51.67	8.96	1.65	1.96	NS*
	Married	108	49.22	9.79			
Maintenance of Interpersonal Relationship	Unmarried	61	36.02	9.18	0.69	1.96	NS*
	Married	108	37.01	8.53			
Total	Unmarried	61	155.41	14.42	0.64	1.96	NS*
	Married	108	153.95	14.10			

* NS: Not Significant

Table 4 shows that there is no significant difference between unmarried and married primary school teachers in teacher role maintenance, respect and honour maintenance, maintenance of interpersonal

relationship, and job stressors.

Null Hypothesis – 5

There is no significant difference between the male and female primary school teachers in their mental health.

Table 5

Difference between Male and Female Primary School Teachers in their Mental Health

Table 5 shows that there is no significant difference between male and female primary school teachers in their mental health.

Gender	N	Mean	SD	Calculated 't' Value	Table Value	Remark
Male	104	19.05	4.83	0.13	1.96	NS*
Female	65	19.14	4.29			

Null Hypothesis – 6

There is no significant difference between the married and unmarried primary school teachers in their mental health.

* NS: Not Significant

Table 6
Difference between Married and Unmarried Primary School Teachers in their Mental Health

Marital Status	N	Mean	SD	Calculated 'r' Value	Table Value	Remark
Unmarried	61	18.85	4.34	0.50	1.96	NS*
Married	108	19.21	4.79			

* NS: Not Significant

Table 6 shows that there is no significant difference between unmarried and married primary school teachers in mental health.

Null Hypothesis – 7

There is no significant relationship between the job stressors of primary school teachers and their mental health.

Table 7
Relationship between the Job Stressors of Primary School Teachers and their Mental Health

Job Stressors	N	Calculated 'r' Value	Table Value	Remark
Teacher Role Maintenance	169	-0.064	0.152	NS*
Respect and Honour Maintenance	169	0.007	0.152	NS*
Maintenance of Interpersonal Relationship	169	0.054	0.152	NS*
Total	169	-0.016	0.152	NS*

* NS: Not Significant

Table 7 shows that there is no significant relationship between the job stressors of primary school teachers and their mental health.

FINDINGS AND DISCUSSION

From the analysis of data, it is observed that 52.07% of them have high level of job stressors in teacher role maintenance. 47.34% of them have high level of job stressors in respect and honour maintenance. 50.89% of them have high level of job stressors in maintenance of interpersonal relationship. 69.82% of them have high level of job stressors. 81.07% of primary school teachers have moderate

level of mental health. This implies the fact that majority of the primary school teachers have high level job stressors. Their mental health is found to be just moderate. The reason behind these findings is that the job stressors of the chosen sample may cause for the deterioration of their mental health. When they have more job stressors, they are unable to work wholeheartedly and they may have severe mental stress. The finding of the correlation analysis also supported this finding, i.e., the job stressors of primary school teachers are significantly correlated with their mental health.

The male and female primary school teachers do not differ significantly in teacher

role maintenance, respect and honour maintenance, maintenance of interpersonal relationship, and job stressors. This may be due to the fact that the male and female primary school teachers may have uniform role in their teaching, due respect etc. Moreover, they have maintained good interpersonal relationship with others. Hence, they are found to be the same in this regard.

The rural and urban primary school teachers differ significantly in job stressors. Among themselves, the rural school teachers have more job stressors. This may be due to the fact that the rural school teachers may reside in urban areas because of their children's studies and they have to travel a long distance for their work. This causes more job stressors for these categories of teachers.

The male and female primary school teachers do not differ significantly in

their mental health. The rural and urban primary school teachers do not differ significantly in their mental health. This may be due to the fact that both the male and female categories of teachers working in primary schools may have the equal state of working conditions, qualifications and salary structure. Moreover, they evenly avail the facilities and perquisites and hence they are found to be the same in this regard.

CONCLUSION

It is concluded that the job stressors of primary school teachers do not significantly influence their mental health. There may be some other factor, which may influence the mental health of the chosen sample. Hence, it is recommended that the job stressors should properly identified at the primary level school itself to maintain proper mental strength among the teachers who are the social reformers not only for the nation, but also for the civilized people of the globe.

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<http://www.schoolmentalhealth.org>

<http://www.time-to-change.org.uk>

EFFECTIVENESS OF CAI PACKAGE ON PHYSICS ACHIEVEMENT OF IX STANDARD STUDENTS

4

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NEED FOR THE STUDY

Since antiquity, human beings have sought to understand the workings of nature: why unsupported objects drop to the ground, why different materials have different properties, the character of the universe such as the form of the Earth and the behavior of celestial objects such as the Sun and the Moon, and so forth. Typically the behavior and nature of the world was explained by invoking the actions of gods. Eventually explanations were proposed based on philosophical speculation. Rarely verified by systematic experimental testing, many of them were wrong, but this is part of the dialectical nature of scientific enquiry, and even modern theories of quantum mechanics and relativity are merely considered “theories that have not been broken yet”.

The growth of physics has brought not only fundamental changes in ideas about the material world, mathematics and philosophy, but also, through technology, a transformation of society. Physics is considered both a body of knowledge and the practice that makes and transmits it. The

Scientific Revolution, beginning about year 1543, is a convenient boundary between ancient thought and classical physics. The emergence of physics as a science distinct from natural philosophy began with the scientific revolution of the 16th and 17th centuries, and continued through the dawn of modern physics in the early 20th century. The year 1900 marks the beginnings of a more modern physics. Today, the science shows no sign of completion, as more issues are raised, with questions rising from the age of the universe, to the nature of the vacuum, to the ultimate nature of the properties of subatomic particles. Partial theories are currently the best that physics has to offer, at the present time. The list of unsolved problems in physics is large.

Today, physics is responsible for automation in many industries. Its principles are having universal applications. Its understanding will help the children learn the scientific concepts in reality. It is an essential subject for all human beings. Physics at high school level is important one as these forms as the base for the future applications in science, engineering

and other related fields. Automation in learning physics will be useful for children to understand the concepts of physics. Learning Physics concepts through CAI will be an interesting and meaningful learning experience for children. So, the present study is an attempt to find out the effectiveness of CAI on Physics achievement of IX standard students in Madurai City.

BACKGROUND OF THE PROBLEM

The present era is undergoing a revolution in the field of education. To meet the great demands of mass education, it is important to introduce new techniques of learning, and to provide reliable instructional material based upon the findings of educational technology.

Technology or automation is a major solution to the challenge posed by 'Knowledge explosion' and 'population explosion'. The CAI is an innovative step in this direction towards automation and individualization of instruction. Several attempts have been made in the form of research studies in this field.

The learning of Physics can be made effective by means of CAI package. It will certainly augment the teaching learning process of Physics. It would be interesting to the students.

Review of relative Literature indicates that CAI packages have been prepared in various disciplines. A survey of the relative literature shows that many studies have

been done in the field of science and in Physics. They reveal that there has been significant positive effect in achievement through CAI package than the traditional method. Hence, it is an attempt to give testimony to it.

OPERATIONAL DEFINITION TERMS

EFFECTIVENESS- refers to the result of independent variable introduced in the study.

CAI PACKAGE – refers to Computer Assisted Instruction Package developed and validated on physics Unit i.e. Wind, Power and Energy for IX standard students of Tamilnadu State Board Syllabus.

PHYSICS ACHIEVEMENT- refers to achievement in criterion referenced test prepared and validated on Physics unit 'Wind, Power and Energy' of IX standard in Tamilnadu State Board Syllabus by the Investigator.

IX STANDARD STUDENTS – refers to IX standard of 10+2+3 system of Education pattern.

OBJECTIVES OF THE STUDY

- ★ To develop a CAI package on Physics unit Wind, Power and Energy for IX Standard Students of Tamilnadu State board Syllabus
- ★ To validate the CAI package on Physics unit Wind, Power and Energy for IX Standard Students of Tamilnadu State board Syllabus

- ★ To prepare a criterion test on Physics unit Wind, Power and Energy for IX Standard Students of Tamilnadu State board Syllabus
- ★ To validate the criterion test on Physics unit Wind, Power and Energy for IX standard Students of Tamilnadu State board Syllabus
- ★ To find out the effectiveness of CAI package on Physics achievement of IX standard Students.
- ★ To find out the effectiveness of CAI Package on Physics Achievement of IX Standard Students in terms of various sub groups of the sample selected for the study.

HYPOTHESES

1. There is no significant difference between the mean scores on Criterion Test “Work, Power and Energy” (post test) between experimental and control group students of IX standard.
2. There is no significant difference between the mean scores on Criterion Test “Work, Power and Energy” (post test) between experimental and control group boys of IX standard.
3. There is no significant difference between the mean scores on Criterion Test “Work, Power and Energy” (post test) between experimental and control group girls of IX standard.

LIMITATIONS OF THE STUDY

The study was confined only to the CAI package developed and validated on Physics unit of IX standard syllabus of Tamilnadu Textbook Society on the unit Power, Wind and Energy. The study was taken only for IX standard students following Tamilnadu State Board Syllabus.

The experiment was conducted only in the urban centre. Rural area students have not been included in the study. The IX standard Matriculation, CBSE, ICSE and other streams have not been taken into consideration for the present study. The study was conducted only with English medium students of IX standard syllabus of Tamilnadu Textbook Society. The Tamil medium students of IX standard students were not taken into consideration for this study.

METHODOLOGY

Design of The Study

A worthwhile research project is likely to result from a well formulated research design. The design can be equated to a blue print which provides a clear cut guideline to the investigator in carrying out his/her research successfully. In the present study, the investigator developed and validated CAI package on Physics unit Work, Power and Energy. To achieve the objectives the investigator has chosen a pretest – post test equivalent groups design. The Schematic presentation of the design for the present study is given in Table 1.

Table 1
Schematic Presentation of Research Design

It is a pretest –post test equivalent groups design	
I VARIABLES UNDER THE STUDY	
1.Independent Variable	1. Learning the unit Work, Power and Energy through CAI package - Experimental Group
	2. Learning the unit through Work, Power and Energy through Traditional Teaching method - Control Group
2. Dependent Variable	Criterion in Work, Power and Energy
3. Covariates	Pre-test scores
The above variables are studied under gender and parental wise sub groups	
II TOOLS USED	
Name of the Tool	Purpose
1. Achievement Test on Work, Power and Energy	To measure the achievement of the IX standard students in the unit Work, Power and Energy
2. Embedded Tests	To measure the progressive Achievement of students in the unit Work, Power and Energy
3. Stimulus Materials Used CAI Package on “Work, Power and Energy”	As the treatment variable
III SAMPLES SELECTED	
a) For the Development of CTWPE	Purpose
1. Two college physics lecturers and four practicing teachers	Getting ideas, concepts for drafting CT-WPE
2. Twenty IX standard students from section A of Thiagarajar Model Hr.Sec. School.	For doing item analysis of CTWPE
3. Twenty IX standard students from section B of Thiagarajar Model Hr.Sec. School.	For establishing reliability and validity of CTWPE
b) for the Development of CAI Package	Purpose
1. Two college physics lecturers and four practicing teachers	For Getting ideas regarding construction of frames for CAI

2. Two Computer Teachers from E.V.R. Corporation Girls Hr. Sec. School				For validating the CAI package
3. Four IX standard students from section C of Thiagarajar Model Hr.Sec. School				For Trying out the CAI package
c) For conducting experiment				
Group	No. of Students			School
	Boys	Girls	Total	
Experimental I (CAI Package)	20	20	40	1. Thiagarajar Model Hr.Sec. School
Control Group	20	20	40	1. Thiagarajar Model Hr.Sec. School 2. E.V.R.Corporation Girls Hr.Sec. School
IV COLLECTION OF DATA				
Data were collected from the identified students using CTWPE before and after the treatments.				
V STATISTICAL TECHNIQUES USED				
Measures of central tendencies, measures of variability, coefficient correlation, Spearman Brown Prophecy Formula, t-test, ANOVA, ANCOVA and product moment correlation were applied to the data.				

PREPARATION OF CRITERION TEST ON WORK, POWER AND ENERGY

The investigator prepared a criterion test to test the effectiveness of CAI package on Learning Physics unit for IX standard students. It is a criterion referenced test. Criterion Test is used to measure the instructional objectives of the programme. Generally, objective test items are used in a criterion test.

The investigator has identified Work, Power and Energy as the unit for testing

the effectiveness of CAI package on Physics achievement of IX standard students. Therefore the investigator has taken the teaching points identified for the CAI package as the criteria for the achievement test on Physics. They are presented as follows.

CONSTRUCTION OF TEST ITEMS

The investigator after identifying items for the criterion test on work, power and energy started constructing items for the CTWPE.

DATA COLLECTION

Being an experimental study the data had to be generated, unlike the survey. It is a pre-test – post-test control group design was planned to achieve the objectives of the study. In this attempt students from two different schools were selected. They were randomly assigned to different treatments (i) Experimental – learning through CAI package and (ii) Control group – traditional way of learning. The sample selected for conducting the experiment was presented under Table 1.

DATA ANALYSIS

The investigator applied ‘t’ tests between experimental and control groups for the post test scores of Criterion Test on Work, Power and Energy.

Hypothesis 1

There is no significant difference between the mean scores on Criterion Test Work, Power and Energy (post test) between experimental and control group students of IX standard.

Table 2

Significance of Difference of Mean Achievement on Criterion Test Work, Power and Energy (Post Test) Between Experimental and Control Groups

S. No.	Group	N	Mean	SD	t Value	df	Level of Significance
1.	Experimental	40	69	10.96	4.695	78	0.01
2.	Control	40	58	10.56			

Table 2 shows that the ‘t’ value between the experimental and control groups’ students in their mean achievement on Criterion Test Work, Power and Energy is 4.695. It is significant at 0.01 and 0.05 level for the df 78. The mean of Experimental group (69) is higher than the mean of control group (58). Therefore the null hypothesis stated is rejected. It can be inferred that the

CAI Package on Work, Power and Energy has effected the students’ achievement in physics concepts.

Hypothesis 2

There is no significant difference between the mean scores on Criterion Test Work, Power and Energy (post test) between experimental and control group boys of IX standard.

Table 3

Significance of Difference of Mean Achievement on Criterion Test on Work, Power and Energy (Post Test) Between Experimental and Control Groups-Boys

S. No.	Group	N	Mean	SD	t value	df	Level of Significance
1.	Experimental	20	77	8.26	3.170	38	0.01
2.	Control	20	64	9.78			

Table 3 shows that the 't' value between the experimental and control groups' boys in their mean achievement on Criterion Test Work, Power and Energy is 3.170. It is significant at 0.01 and 0.05 level for the df 38. The mean of Experimental group (77) is higher than the mean of control group (64). Therefore the null hypothesis stated is rejected. It can be inferred that the CAI

Package on Work, Power and Energy has effected the boys' achievement in physics concepts.

Hypothesis 3

There is no significant difference between the mean scores on Criterion Test Work, Power and Energy (post test) between experimental and control group girls of IX standard.

Table 4

Significance of Difference of Mean Achievement on Criterion Test on Work, Power and Energy (Post Test) between Experimental and Control Groups-Girls

S. No.	Group	N	Mean	SD	't' Value	df	Level of Significance
1.	Experimental	20	62	7.72	2.567	38	0.05
2.	Control	20	52	8.19			

Table 4 shows that the 't' value between the experimental and control groups' girls in their mean achievement on Criterion Test Work, Power and Energy is 2.567. It is significant at 0.05 level only for the df 38. The mean of Experimental group (62) is higher than the mean of control group (52). Therefore the null hypothesis stated is rejected. It can be inferred that the CAI Package on Work, Power and Energy has effected the girls' achievement in physics concepts.

FINDINGS

★ The developed CAI Package on Work, Power and Energy has effected positive

changes in the IX standard students' achievement in physics concepts.

- ★ The CAI Package on Work, Power and Energy has effected positive changes in the boys' achievement in physics concepts.
- ★ The CAI Package on Work, Power and Energy has effected positive changes in the girls' achievement in physics concepts.

CONCLUSION

The present findings are derived from the experimental and control groups. Based on the attempts made by the investigator and the findings of the related

studies, the investigator feels that far reaching conclusions could not be arrived at. As discussed earlier, the present study has attempted to find out the effect of CAI package on the physics concept Work, Power and Energy for IX standard students. In order to find out the effectiveness the investigator has developed and validated CAI Package on Work, Power and Energy. Further to assess the effectiveness of the developed CAI package on IX standard students achievement in physics constructed and validated a Criterion Test on Work, Power and Energy. From the perusal of the

present findings the following conclusions can be drawn. They are:

- ★ The CAI Package on Work, Power and Energy has effected the students' achievement in physics concepts after adjusting the initial differences.
- ★ The CAI Package on Work, Power and Energy has effected the boys' achievement in physics concepts after adjusting the initial differences.
- ★ The CAI Package on Work, Power and Energy has effected the girls' achievement in physics concepts after adjusting the initial differences.

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FUNCTIONING OF SCHOOL COMMITTEES AT PRIMARY LEVEL

5

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INTRODUCTION

Nations children are its supremely important asset and the nations future lies in their proper development. A healthy and educated child of today is the active and intelligent citizen of tomorrow. The well being and development of children is determined to a great extent by the social, economic and political environment in which they live. All children do not get the much needed affection and attention to develop competence. They lack love, warmth, care, guidance are also deprived of basic needs such as food shelter, clothing, education, and recreation. The incidence of killer diseases, accidents, disasters, riots, poverty conditions, child neglect, abuse, delinquency and abandonment have led most of these children to institutions. The trend of family disruption, death of parents, maternal mortality, separation, desertion and divorce has led to an increase in the absolute and relative number of orphans and institutionalized children [Kavitha, 2002].

Orphan is a child who has lost his natural parents and who has no immediate relative or guardian to support him/her.

The child becomes a homeless, neglected, dependent child for no fault of his own. They can be classified into three categories namely: complete orphans, parental orphans and maternal orphans [Chugh, 2004].

An orphanage is an institution dedicated to caring for orphans. The term is also sometimes used to denote institutions where children reside without parents, irrespective of the life status of the latter. The term “orphanage” has been largely replaced by “group home” in modern times. Certain parents were often pressured or forced to give up their children to orphanages; those born out of wed lock; those born into poor families; those born with disabilities; or whose parents have disabilities; and girls born into patriarchal societies. An orphan is a person who has lost both parents, often through death [www.bookrags.com].

About three quarters of children in-group care have been victims of neglect and abuse. One quarter of children are psychologically damaged due to abuse or other causes. Once they are placed in-group care, they are likely to remain there throughout childhood. With severe

problems, such as high levels of aggression or anger, they are largely unadoptable. No family wants to house them even temporarily in a foster home. Increase in-group home is a solution to complex social problems associated with unwed mothers. The consequences of living away from family may be quite positive, depending on the particular characteristics of the staff of the group home and whether child and youth care workers are able to develop an effective, stable and strong emotional bond with a specific child. On the other hand, if a worker is unable to form a meaningful relationship with a child in group home, the results may well be unfavorable [Feldman, 2005].

Throughout the world number of children are kept in orphanages and non-penal institutions. Many of these children have been condemned to live in a grim (fear- full) existence, and are subjected to shocking and at times deadly levels of abuse and neglect. Many children who end up in orphanages have at least one living parent but have been abandoned because their families are poor, jobless, ill or trouble with law [www.hrw.org].

When the child was placed in an institution, it affects the overall development of the child. The child cannot get proper academic facilities, motivation, love, affection, emotional and social support in the institution as at home. The child's psychological needs cannot be fulfilled in the institution [Auctichya, 2004],

The powerful effect of early experience is dramatically apparent in the development of children who lack the rich, varied

stimulation of normal homes. Children reached in severely deprived family situation or institutions remain substantially below average in physical and psychological development and display behavior and emotional problems throughout childhood [Johnson, 2000], When children spend first two years or more in deprived institutional care, all domains of development usually remain greatly delayed [Johnson, 2000].

The bland, colourless rooms where orphan spend their lonely days, rarely touched or spoken to lead to deficits in intermodal perception. Children who have trouble integrating information across modalities tend to be overwhelmed by stimulation, reacting to it with disorganized behaviour or withdrawal. As a result, motor, cognitive and social development suffers. Unfortunately, many infants reared in underprivileged environments- where homes or institutions- continue to be affected by disadvantaged conditions during their child hood years [Berk, 2003].

Academic achievement has become the sole yardstick of self worth and success and students are made to feel unworthy and quality for performing low at school. Yet academic under achievement is one of the major problems among adolescents.

There are so many factors that might be leading to academic stress among adolescents such as the geographical areas of both the school and the students environment, socio economic status, background, culture, religion and educational background, motivation, facilities around the school environment for the students hence causing all the kinds of

inconvenience for students to concentrate on their studies [Mathew, 2006].

Facing examination is stressful but it serves to test the adequacy and competitiveness of a person. Out of the number of stresses faced by adolescents, academic stress emerges as a significant mental health problem. Anxiety about examination is due to high expectation and competition. Naturally there is very high demand to achieve the maximum or centum or near centum marks in the crucial examinations. These demands create tension, fear and at times marked anxiety to some students before or during crucial examinations. They present a picture of acute stress reaction, in the form of fear of facing examination or avoidance behavior by refusing to appear for the crucial examination.

Fear of facing examination or avoiding to face examination in most of these cases is due to the doubt that one may not get the desired or the required percentage of marks. This has become an important mental health problem for some adolescents. Competition and high achievement is necessary for a progressive society but at the same time it leads to mental health problems. This can be due to personal vulnerability, poor stress tolerance, doubts about their own ability, over expectation and undue demands from others. This psychological problem can be called as fear of achieving desired academic target, it is a stress reaction of refusal and avoidance. [Rangaswami, 1995],

STATEMENT OF THE PROBLEM

The investigator has taken up this study on the "Management of Stress by the Children Living in the Institutions".

OBJECTIVES OF THE STUDY

- ★ To study the causes and effects of stress among children living in institution
- ★ To find out influence of stress on their academic performance and psychological changes.

METHODOLOGY

The sample for the present study included 80 adolescents, out of them forty boys and forty girls who were found to have stress problem and they were selected for the study.

Tools Used

Interview schedule and standardized tools were used for the study.

RESULT AND DISCUSSION

Result and discussion consisted of

- A. Factors leading to stress in life situation.
- B. Stress symptoms that existed among the selected adolescents in different conditions
- C. Stress and its influence on academic performance.

A. Factors Leading to Stress in Life Situation

Various life events causes stress in adolescents which includes stress in life situation, general assertive behaviour pattern and daily hassles.

1. Stress in Life Situation

The Table I gives the details regarding the factors leading to stress in life situation among adolescent boys and girls.

Table 1
Stress in Life Situation

(N=80)

S. No	Aspects	Parti- culars	Mean		SD		t-Value
			Before	After	Before	After	
1.	Stress in life situation	Boys	22.00	10.40	1.87	2.08	28.11**
		Girls	22.30	9.95	1.66	2.33	26.03**
2.	Problems leading to stressful condition	Boys	17.40	6.40	2.73	1.37	31.36**
		Girls	18.05	6.85	2.09	1.35	31.40**

** - Significant at 1% level

Table 1 shows that the selected adolescents were experienced stress in life situation such as lack of time, lack of family support and change in living condition. The relaxation therapy and orientation helped adolescent boys to reduce their stress and it was noted from 22.00 to 10.40 and for adolescent girls it was 22.30 to 9.95. The t-value was also highly significant at one percent level. Their attitudes and negative thoughts during problem situation such as heavy work, family crisis, minor injuries, accidents and misunderstanding with friends, sisters and brothers which leads to stressful conditions was reduced after educational programme and counseling. After the programme there was a remarkable change occurred in the mean values obtained for adolescent girls from 18.05 to 6.85. It was also significant at one percent level for both boys and girls.

B. Stress Symptoms that Existed Among The Selected Adolescents in Different Conditions

The following picture depicts the physical stress symptoms, mental stress symptoms, emotional stress symptoms and situation leads to emotional stress.

1. Physical stress symptoms

The selected adolescents were asked to give their stress symptoms. The mean scores for physical symptoms of stress in adolescents. Adolescents felt tensed and experienced muscle pain, head ache, sweating, changes in breathing rhythm, cold hands and foot and ulcer during various stress situations and it was reduced tremendously from 19.10 to 7.45 for adolescent boys and 20.30 to 6.60 for adolescent girls after orientation and therapy. The t-value for both male and female was also highly significant at one percent level.

2. Mental stress symptoms

It was discouraging to find that the selected respondents were suffering from the mental stress symptoms like lack of concentration, making frequent mistakes and forgetfulness. But it was reduced to a great extent after the orientation and therapy treatment from 19.60 to 7.15 for adolescent boys and 20.55 to 7.45 for adolescent girls which is highly significant at one percent level for both adolescent boys and adolescent girls.

3. Emotional stress symptoms

Before the counselling programme the adolescent boys and girls experienced a high level of emotional symptoms during stress. Emotional stress symptoms like short temper, emotional outburst, guilt, hatredness, fear, anxiety, irritation and depression were reduced dramatically after the counselling programme. The mean value was 24.30 which is decreased to 8.80 for adolescent boys and 24.70 for adolescent girls which is decreased to 8.60. Its t-value was highly significant at one percent level.

4. Situation leads to emotional stress

Economic hardship, family relationships, physical changes, exposure to new social situations, societal expectations and sense of insecurity

were also some of the problem situations the adolescent faced. It was encouraging to see that the stress symptom during emotional situation was reduced after the orientation and counselling programme. It was noted with the reduced mean for adolescent boys from 17.60 to 8.05 and for adolescent girls 18.20 to 7.85 and was also highly significant at one percent level. Separation from parents and friends, hesitation to express opinion, aggressive behaviour of others, fear of contacting others and death of parents were the major situations for the adolescents to face emotional stress.

C. Stress and its Influence on Academic Performance

Table 2 shows both adolescent boys and girls were prone to stress in academic performance.

Table 2
Stress due to Academic Work

S. No	Particulars	Boys		Girls	
		BE	AE	BE	AE
1.	Lack of concentration on subject	98	38	93	38
2.	Poor memory power	95	43	92	40
3.	Disinterested in collecting material	95	15	92	45
4.	Disinterested in reading, writing and recalling	93	30	89	31
5.	Poor physical strength	93	35	93	43
6.	Lack of interest in studies	90	20	92	38
7.	Fear of examination and its results	60	38	90	28
8.	Lack of guidance	90	43	88	25
9.	Post relationship with teachers	90	33	95	45
10.	Fear of teachers	90	50	92	35
11.	Freedom with lessons	85	48	98	45
12.	No participation in extra curricular activities	80	21	38	29

Table 2 shows that before the orientation programme 98 percent of adolescent boys and 93 percent of adolescent girls showed lack of concentration on subjects and after the orientation programme it was reduced to 38 percent. Before the programme 95 percent and all the adolescent boys and girls respectively had poor memory power, but after the orientation and counselling programme it was reduced tremendously to 43 percent and 40 percent for adolescent boys and girls respectively. Ninety to 95 percent of adolescent girls and boys had no interest to collect study materials read, write and recall method, but the orientation programme helped them to follow correct method of the study at proper time. So their rate decreased to 15 percent and 45 percent respectively for both boys and girls which was a remarkable change.

Before the programme 93 percent of adolescent boys and girls had very poor physical strength and after the orientation and counselling programme they could improve their strength and it was reduced to 35 percent for adolescent boys and 43 percent for adolescent girls. Nearly 90 percent of adolescent boys and girls showed lack of interest in their studies the programme motivated them to reduce to 20 percent for boys and 38 percent for girls respectively, which was a drastic change.

Fear during examination is one of the major stresses in the academic performance of adolescents. Examination causes anxiety, which leads to stress in students. Apart from this, it was coupled with the pressure from the elders, peer group and society, which is also responsible for stress and examination fear. The fear of examination result was very high for boys (60%) and

girls (9%) after counselling programme the fear was reduced to 38 percent for boys and 28 percent for girls. Before the programme almost all the adolescents (90%) had lack of guidance, after the counselling and orientation programme the respondents approached people for guidance. Before programme 90 percent of adolescent boys and 95 percent of adolescent girls had less relationship and contacts with their teachers, after the orientation programme it was reduced considerably by 33 percent for boys and 45 percent for girls. Majority of adolescent boys and girls were not interested in attending regular classes in schools. The counselling programme made them to take interest in attending the classes.

Eighty-five percent of adolescent boys and 90 percent of adolescent girls had experienced a strong fear about their teacher. Orientation and counselling programme helped the selected adolescent girls and boys to be free with their teachers when compare with before programme. Majority of adolescent girls and boys felt before educational programme bored with lessons, but the respondents realised the importance of education through orientation and counselling programme and it was 48 percent for boys and 45 percent for girls. Eighty percent of adolescent boys and 58 percent of adolescent girls were not participating in any of the extra curricular activities. But the orientation programme helped them to participate and excel in their extra curricular activities.

CONCLUSION

Stress is normal part of life. But if it left unmanaged, it can lead to emotional, psychological and even physical problems and hence the children should be given proper care and recognition to bring them up in life.

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EMOTIONAL INTELLIGENCE OF B.ED., TEACHER TRAINEES

6

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INTRODUCTION

School is the place for the younger generation to be trained in certain type of activities that form the art of the society. Teachers are considered to be the brilliance of the school, as they nourish the younger generation with the objectives and success of life, which in turn inculcates the values among students. Apart from this, teachers also reflect the essence of sound education, if they are intellectually alive and socially concerned. Thus the teachers play a major role in moulding the ideas, habits and attitudes of the young children which makes them to enrich with mentally alert, emotionally stable, culturally sound and socially efficient. The attainment of such objectives hinges upon for effective functioning of the teachers.

NEED AND SIGNIFICANCE OF THE STUDY

Emotional intelligence is considered to be an important tool to perceive and manage emotions. The emotionally stable teacher ignites the future citizens with the moral values which is highly essential to build a healthy citizen. The teachers having the capacity to maintain the emotional

stability can easily enter and sustain satisfactory interpersonal relationship with the students. Emotional intelligence helps to increase the level of confidence of teachers which leads to unfold innovating powers and entrepreneurship. In order to discharge such a high responsibility, it is very necessary that teacher must be conscious of their emotions. The emotionally stable nature of the teacher will attempt to do the job properly and keep on improving their work behaviour. The personality of teacher must reflect characteristics of good citizenship, so that they may transmit the same to the younger generation. The emotionally intellectual teacher would render their profession with positive attitude and better capabilities in the field of education.

OBJECTIVES OF THE STUDY

- ★ To measure the level of emotional intelligence among B.Ed, teacher trainees.
- ★ To find out emotional intelligence among B.Ed, teacher trainees based on,
 - a. Gender
 - b. Type of Management
 - c. Location of the college

HYPOTHESES OF THE STUDY

1. The level of emotional intelligence among B.Ed., teacher trainees is moderate in nature.
2. There is no significant difference of emotional intelligence among B.Ed., teacher trainees based on Gender, Type of Management, Location of the college.

METHODOLOGY

Survey method was employed for this study.

Sample

300 samples were taken from Government, Government aided and Self-financing colleges of Chennai, Kanchipuram and Thiruvallur districts which follows the stratified random sampling technique.

Table 1
*Emotional Intelligence of B.Ed.,
Teacher trainees*

variable	Level	Fre- quency	Per- cent	Valid Per- cent	Cumu- lative Per- cent
Emotional Intelli- gence	High	101	33.7	33.7	25.7
	Moderate	122	40.7	40.7	66.3
	Low	77	25.7	25.7	100.0
	Total	300	100.0	100.0	

Tool used

Emotional intelligence scale was developed and standardised by Cyberia Shrink (1994), has been used in the present study. Emotional intelligence scale contains 35 items related to six dimensions - self-awareness, self-manageable, internality, motivation, empathy and social skills.

Pilot Study

A random sample of 60 teacher trainees was selected for the study in order to establish reliability and validity of the tool.

Reliability and Validity of the tool

The reliability of Emotional Intelligence Scale was established by split-half method and it was found out to be 0.65. The validity of the tool was 0.81.

DATA ANALYSIS

Hypothesis 1

The level of Emotional Intelligence among B.Ed., teacher trainees is moderate in nature.

Table 1 shows that 40.7% of B.Ed., teacher trainees have moderate emotional intelligence, 25.7% and 33.7% of B.Ed., teacher trainees have low and average level of emotional intelligence.

Hypothesis 2

There is no significant difference of emotional intelligence among B.Ed., teacher trainees based on gender.

Table 2
Comparison of Emotional intelligence – Gender wise

Variable	Gender	N	Mean	SD	t value	LS
Emotional Intelligence	Male	123	99.43	14.685	4.323	0.01
	Female	177	97.10	15.213		

The calculated t-value (4.323) which is greater than the table value, hence it is concluded that there is a significant

difference in the emotional intelligence based on gender. Hence the null hypothesis is rejected.

Hypothesis 3

There is no significant difference of emotional intelligence among B.Ed., teacher trainees based on type of management.

The mean score of Emotional intelligence imbibed among B.Ed., teacher trainees with respect to the type of management (government, government aided and self-finance) have been computed and the difference is tested for significance,

Table 3
Comparison of Emotional intelligence – Type of management

Variable	Type of Management	Sum of squares	df	Mean Square	F value	LS
Emotional intelligence	Between Groups	1836.127	2	918.063	4.156	0.05
	Within Groups	65599.910	297	220.875		
	Total	67436.037	299			

The calculated F-ratio (4.156) which is greater than the table value at 0.05 level of significance, hence it is concluded that there

is a significant difference in the emotional intelligence imbibed among B.Ed., teacher trainees based on type of management.

Table 3(a)

Mean, SD, t-value of Emotional intelligence among the B.Ed., teacher trainees based on type of management

Emotional intelligence				t - values	LS
Type of Management	N	Mean	SD		
Government	100	100.70	18.027	2.97	0.01
Aided	100	94.75	13.182		

Emotional intelligence				‘t’ - values	LS
Type of Management	N	Mean	SD		
Government	100	100.70	18.027	0.95	NS
Self-financing	100	98.72	16.200		
Aided	100	94.75	13.182	1.78	NS
Self-financing	100	98.72	16.200		

Analysis of mean difference between the type of management was tested which reveals that, in the overall emotional intelligence, the teacher trainees who are studying in government college (100.70) found to have comparatively high emotional intelligence than compared to government aided and self – financing colleges.

Hypothesis 4

There is no significant difference of emotional intelligence among B.Ed., teacher trainees based on type of college.

The mean score of Emotional intelligence imbibed among B.Ed., teacher trainees with respect to the type of college (Men’s, Women’s and co-education) have been computed and the difference is tested for significance,

Table 4
Comparison of Emotional intelligence – Type of college

Variable	Type of College	Sum of squares	df	Mean Square	F value	LS
Emotional intelligence	Between Groups	1748.647	2	874.323	3.953	0.05
	Within Groups	65687.390	297	221.170		
	Total	67436.037	299			

The calculated F-ratio (3.953) which is greater than the table value at 0.05 level of significance, it is concluded that there

is a significant difference in the emotional intelligence imbibed among teacher trainees based on type of college.

Table 4(a)

Mean, SD, 't'-values of Emotional intelligence among the B.Ed., teacher trainees based on the type of college

Emotional intelligence				't' - value	LS
Type of College	N	Mean	SD		
Men's	50	97.45	12.014	2.65	0.01
Women's	100	103.40	16.399		
Men's	50	97.45	12.014	2.64	0.01
Co-Ed	150	96.68	11.556		
Women's	100	103.40	16.399	0.38	NS
Co-Ed	150	96.68	11.556		

Analysis of mean difference between type of college was tested which reveals that, in the overall emotional intelligence, the teacher trainees who are studying in women's college (103.40) found to have high emotional intelligence than compared to the emotional intelligence of men's and co-education college B.Ed., teacher trainees.

MAJOR FINDINGS

- ★ The level of emotional intelligence among B.Ed., Teachers trainees is moderate in nature.
- ★ There is a significant difference of emotional intelligence among B.Ed., teacher trainees based on gender. Men B.Ed., teacher trainees found to have comparatively high emotional intelligence than compared to women B.Ed., teacher trainees.
- ★ There is a significant difference of emotional intelligence among B.Ed.,

teacher trainees based on type of management. The teacher trainees who are studying in Government College found to have comparatively high emotional intelligence than compared to government aided and self – financing colleges.

- ★ There is a significant difference of emotional intelligence among B.Ed., teacher trainees based on type of college. The teacher trainees who are studying in women's college found to have high emotional intelligence than compared to the emotional intelligence of men's and co-education college B.Ed., teacher trainees.

EDUCATIONAL IMPLICATION

Findings of the present study reveal the important educational implication for the Teacher-educators, School authorities and Teacher trainees. The study has shown

that the importance of acquiring emotional intelligence as a part of their academics. The study also gives a strong message that the training of the prospective teachers could not be completed not only with the academic knowledge and skills required for teaching but the training should also enable them to develop favourable emotional stability which in turn enhance the interpersonal relationships, cognitive ability, group structure and process,

managing the situations, positive attitude inculcation, development and perception, and handling of instructional strategies.

CONCLUSION

The purpose of the present study was to study the emotional intelligence of B.Ed., teacher trainees. The study is sure to find some usefulness in the field of education and finding of the study can serve as a database for further research.

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CONSTRUCTION AND STANDARDIZATION OF EMOTIONAL INTELLIGENCE SCALE

7

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INTRODUCTION

At present, the concept of emotional intelligence is used in various fields like education, business and so on. Because, the emotional outburst become an evil power to disturb the social peaceful. If the emotions are not controlled by a person, it will affect physically and mentally of others, it must be controlled by a psychological domain. Thus, the person should know how to control our emotions and how they affect others. If is surely make an awareness of emotions for this purpose, the emotional intelligent will useful to manage the emotions. It leads the peaceful life and makes a successful life According to Daniel Goleman's, (1998) Emotional intelligence is 80% responsible for success in life and intelligence is only 20% responsible. Emotional intelligence is a proper and precise key for control one's emotions.

Emotional Outbursts

Emotional outburst is the effect of suffering are person by the another person when setting emotions. Emotion is not controllable but it is manageable. Normally, in real classroom the student's emotions affects the teacher as well as the teacher's

emotions affects the students. It is proved by the news of

'The Hindu 10th October 2013', "Suresh 45years old principal of Infant Jesus College of engineering, Keezha vallanad in Tuticoein district, was fatally attacked with long knives as soon as he got out of his car. The suspension of a final year aeronautical engineering student, for his behavior on and off the college campus, allegedly provoked him to murder the principal".

'The Hindu 9th February 2012', "A teacher was stabbed to death in the classroom of a Chennai school, allegedly by 15 years-old student who was upset at being repeatedly reprimanded by her for not doing well in studies".

'Hindustan times 17th August 2010', "Abhishak sahai 19 year old B.Tech student of SRM university NCR campus, Delhi, fell from hostel building on 15.08.2010 and succumbed to injuries allegedly ragging by seniors".

'Dinamani 1st Jun 2008', "*Babiya* Chatterjee (22) a fourth year B.Tech student of IIT, Kanpur committed suicide on 40th convocation day of the institute, because she cheated her parents that she had graduated".

It shows clearly to us, these incidents are only made by an individual by setting because those persons know about how to manage their emotions. In that case, the emotional intelligence will be used by the person in emotion free life.

NEED AND SIGNIFICANCE

From the sustainable evidence of the earlier paragraphs, the emotion of the individual person should be managed for a peaceful and successful life of the individual. If an individual is affected by the emotional outburst, it produces the society with negative perception.

The students should know how to manage their emotions. So the researcher is interested to know the level of emotional intelligence of adults. For the purpose, a new tool of emotional intelligence is constructed and standardized by the researcher.

Emotional Intelligence

Emotional Intelligence is, perceiving ours and other emotions, understanding them and use in our thought and action. Following are some of the definitions of emotional intelligence given by renowned psychologists. Salovey and Mayer (1990) conceptualized the term emotional intelligence as the subset of social intelligence that involves the ability to monitor one's own and others feelings and emotions, discriminate among them and to use information to guide one's thinking and action. Dr. Reuven Bar-On (1997) Emotional Intelligence is an array of emotional, personal and social abilities which influence one's overall ability to cope effectively with environmental demands and pressure.

Many psychologists tried to explain the nature and characteristics of emotional intelligence through models. Models of emotional intelligence have been developed on three aspects that is, ability, traits and mixed model of emotional intelligence.

Research Questions

The researcher was developed for achieving the following research question:

- Can the Emotional Intelligence tool developed and standardized for adults? (EISA).

Research design

Research design is a blue print of the research process. It includes the method, sample and sampling technique, data collection and analysis.

Method, Sample and sampling technique of the study

The researcher used normative survey method to conduct research. The sample comprised of 300 adults was selected from Government, Private and Aided Colleges in Thanjavur District of Tamilnadu state by using simple random sampling technique.

Construction of a tool

In any type of tool, the preparation of test plan is essential. So the researcher has planned the objectives, population, content of test items and procedure to be followed the standardization background of Daniel Goleman model the researcher developed the emotional intelligence tool.

Development of emotional intelligence scale for adults

The researcher studied the concept of emotional intelligence in detail with the help of some useful sources and to follow the Daniel Goleman’s emotional intelligence construct. Denial Goleman’s model has five domains along with twenty five components.

All the twenty five components of Daniel Goleman’s model have not been taken up for tool construction, only twenty components have been taken. Because the emotional intelligence competencies have changed from the original model published in Daniel Goleman’s (1998) book ‘working with emotional intelligence’ and the model given in Table.1.

Table 1

Framework of Daniel Goleman’s and Richard Boyatziz Emotional Competencies (Four Clusters)

	Self Personal Competence	Other Social Competence
Recognition	Self Awareness Emotional self awareness Accurate self assessment Self confidence	Social Awareness Empathy Service orientation Organisational awareness
Regulation	Self Management Self control Trustworthiness Conscientiousness Adaptability Achievement drive Initiative	Relationship Management Developing others Influence Communication Conflict management Leadership Change catalyst Building bonds Teamwork & collaboration

The researcher discussed with eminent scholars in the field of education and psychology and reviewed previous studies for the items of emotional intelligence scale. Situational scale was found to be a good choice. A particular situation is given in each question and four alternative way of behavior is given in the answer. The

respondents go through each situation and they should respond how they would behave in that particular situation. It is proposed to write four situations for each component of emotional intelligence. Therefore 20 components, 80 situations (items) were written in Tamil language.

Item selection

The researcher to select the item for the pilot study and the constructed tool was consulted with one Professor of Education and two Associate Professors of Education. They are experts in the field of emotional

intelligence. They were requested to judge the suitability of the items. Out of 80 items, 40 items were rejected by most of the judges. Now, the scale of emotional intelligence consists of 40 items. Dimension wise distribution of items on EIS given table.2.

Table 2

Dimension wise Distribution of Items on EIS

S. No.	Domains of Emotional Intelligence	Number of Items
1.	Self Awareness	06
2.	Social Awareness	06
3.	Self Management	12
4.	Relationship Management	16
Total		40

Administration of the tools

The researcher to collect data for the present study and administered the tools of the present study individually with proper permission from the head of the colleges in Thanjavur District of Tamilnadu state. The researcher gave a brief introduction about in this research and also provided guidelines to the respondents about filling the tool. Whenever respondent faced any problem the researcher rectify immediately.

Pilot study

The emotional intelligence scale which consists of 40 items was administered on the sample of as 100 adults of Thanjavur District, Tamilnadu. A score of one was

given to each correct answer and zero was given to each wrong answer and the maximum marks for a question is 1 and the minimum mark is 0. Then respondent responses have been scored and their total marks secured for all the 100 subjects have been recorded. In this study 36 statements were selected and 4 statements were rejected. After that the rejected items were corrected and subjected to standardization. Because those items fully regards to two dimensions which would be omitted due to the rejection. Finally the 40 statements have been selected for the final study. The pilot study t values of the 40 statements are given Table.3.

Table 3

‘t’ Value for Pilot Study

S.No.	Item Number	‘t’ Value	Result	S.No.	Item Number	‘t’ Value	Result
1.	1	1.85	S	21.	21	2	S
2.	2	2.24	S	22.	22	1.09	N S
3.	3	4.91	S	23.	23	2.24	S
4.	4	2.55	S	24.	24	2.03	S
5.	5	4.90	S	25.	25	2.43	S
6.	6	4.59	S	26.	26	2.37	S
7.	7	3.52	S	27.	27	3.28	S
8.	8	2.59	S	28.	28	2.03	S
9.	9	2.59	S	29.	29	4.24	S
10.	10	4.91	S	30.	30	-0.83	N S
11.	11	2.93	S	31.	31	5.87	S
12.	12	2.25	S	32.	32	2.24	S
13.	13	2.47	S	33.	33	2.29	S
14.	14	2	S	34.	34	3.91	S
15.	15	3.61	S	35.	35	1.96	S
16.	16	3.26	S	36.	36	2.99	S
17.	17	-1.67	N S	37.	37	-1.09	NS
18.	18	1.85	S	38.	38	4.37	S
19.	19	2.32	S	39.	39	2	S
20.	20	2.07	S	40.	40	2.99	S

Item analysis

One of the important steps in the standardization of any tool is item analysis. For this purpose, the researcher used 100 answer sheets of the sample selected. The individual emotional intelligence scores for entire 100 samples were found out and they were arranged from the highest to the

lowest score. After that the researchers took top 27% of the sample – the high scorers, and the bottom 27% - the low scorers. The high and low groups, thus selected, formed the criterion groups. Each group consists of 27 answer sheets. They were sorted for the purpose of item selection. The following formula was used (Edwards, 1957) to calculate ‘t’ value of each items.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{S_H^2}{n_H} + \frac{S_L^2}{n_L}}}$$

Where

\bar{X}_H = the mean score on a given statement for the high group

\bar{X}_L = the mean score on a given statement for the low group

S_H^2 = the variance of the distribution of response of the high group of the statement.

S_L^2 = the variance of the distribution of response of the low group of the statement.

n_H = the number of subjects in the high group

n_L = the number of subjects in the low group

Characteristics of the Tools being Standardization

If any research tool, item analysis, validity, reliability, norms of the tool must be analysis and find out values because to

find out the tool is standardized or not. After the pilot study emotional intelligence scale which consists of 40 items was administered on the sample of as 300 adults for final study. The final study t values of 40 statements are given Table.4.

Table 4

't' value for final study

S.No.	Item Number	't' Value	Result	S.No.	Item Number	't' Value	Result
1.	1	1.85	S	21.	21	2	S
2.	2	2.24	S	22.	22	1.89	S
3.	3	4.91	S	23.	23	2.24	S
4.	4	2.55	S	24.	24	2.03	S
5.	5	4.90	S	25.	25	2.43	S
6.	6	4.59	S	26.	26	2.37	S
7.	7	3.52	S	27.	27	3.28	S
8.	8	2.59	S	28.	28	2.03	S

S.No.	Item Number	't' Value	Result	S.No.	Item Number	't' Value	Result
9.	9	2.59	S	29.	29	4.24	S
10.	10	4.91	S	30.	30	1.99	S
11.	11	2.93	S	31.	31	5.87	S
12.	12	2.25	S	32.	32	2.24	S
13.	13	2.47	S	33.	33	2.29	S
14.	14	2	S	34.	34	3.91	S
15.	15	3.61	S	35.	35	1.96	S
16.	16	3.26	S	36.	36	2.99	S
17.	17	2	S	37.	37	4.02	S
18.	18	1.85	S	38.	38	4.37	S
19.	19	2.32	S	39.	39	2	S
20.	20	2.07	S	40.	40	2.99	S

S : Selected

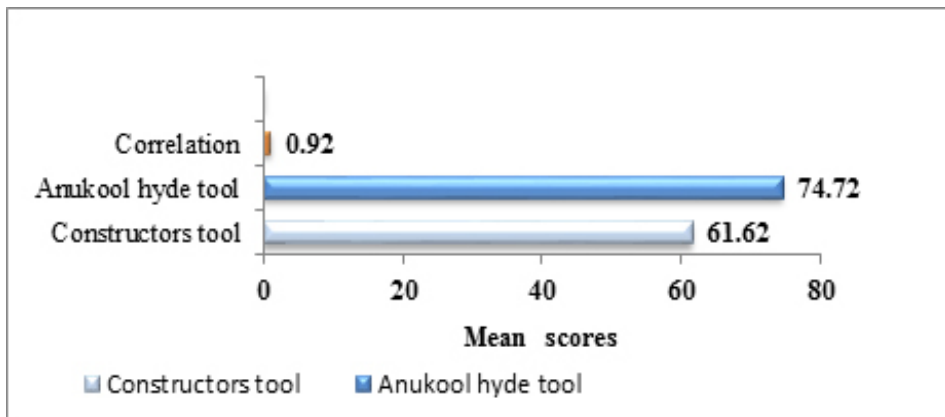
NS : Not Selected

Validity

Validity refers the tool which is intent to measure the measures. To obtain validity, the emotional intelligence tool was sent to three subject expert who are working in educational universities and requested to check the items. By the reply of the experts,

the tool has face and content validity. On the other hand, for establishing criterion validity, the tool was correlated with the emotional intelligence of Anukool Hyde (2007). It was found to be 0.92. It value given Graph.1

Figure 1



Reliability

Reliability refers both stability and consistency of test scores. Here the reliability was established by split-half method and Cronbach's alpha method through SPSS package which are 0.62 and 0.71 respectively.

Norms

The researcher presented general norms of entire sample. The maximum marks for the emotional intelligence scale is 40. The general norm are One who scores up to 40% is said to have low level of emotional intelligence, it one scores above 40% to 60% are said to have an average level of emotional intelligence and it one who scores above 60% is said to have high level of emotional intelligence. On this basis, the entire samples were divided into three groups. The general norms are given Table.5.

Table 5
Norms

S.No.	Level of EI	Scores Range	Scores %
1	Low	1-16	1% - 40%
2	Average	17-24	41% - 60%
3	High	25-40	61% - 100%

STATISTICAL TECHNIQUES

For standardizing the test of emotional intelligence the following statistical techniques were used.

- ❖ Descriptive analysis (Mean and standard deviation)

- ❖ Differential analysis ('t' test & 'F' test)
- ❖ Correlation analysis ('r' Coefficient of correlation)

FINDINGS

The aim of the research is to construction and standardization of emotional intelligence scale for adults. For achieving this aim, the researcher constructed emotional intelligence scale following steps like development of emotional intelligence scale, item analysis and item selection. After item analysis the final form was given to the emotional intelligence scale. The reliability and validity were also tested. Reliability quotients were tested using two methods and reliability quotients were good. Validity was tested using three methods and they were found good. The general norms were tested entire sample and general Norms are presented.

EDUCATIONAL IMPLICATION

Exploration of emotional outbursts will offer the in peaceful surroundings. In present days, manages emotion is essential to all individuals. Emotional intelligence is the exact tool for molding unemotional human being. Emotion is hot, controllable but it is managed by an individual with the help of emotional intelligence. Some persons did not know how to manage the emotion. The tool gives a concept to the reader when they reading the questionnaire. It is one possibility to know the dimension of emotional intelligence. It may be used to an individual how the emotion could be managed. Emotional intelligence scale is standardized. This tool is used to find out Emotional Intelligence Quotients of adults.

Hence researchers, voluntaries, teachers, teacher trainees and students to take this tool into find out the Emotional Intelligence Quotients and to know and develop their emotional intelligence.

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DEVELOPING COGNITIVE MODELING STRATEGIES IN ENHANCING ACHIEVEMENT IN ENVIRONMENTAL POLLUTION IN SCIENCE EDUCATION

8

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INTRODUCTION

The 20th century is over. The future years would critically analyze the last century in its various facets, aspects and accomplishments. It is too early in the time frame of history to pronounce judgments on the last 100 years. There will be very different approaches to list the achievements and failures whenever attempts to list these would be made. It is universally acceptable that much has happened in practically every realm of human endeavor and that too, at a much faster pace than any of the comparable time frames of the past. It has been a century of great achievements in scientific and technological sectors as well as in social, economic and cultural sectors.

John Dewey (1952) pointed out that education is responsible for a desirable social change. The same view by Swami Vivekananda (1863-1902) that education is not the amount of information that is put into your brains and runs riot these undigested all your life. We must have life - building, man making, character making, assimilation of ideas. A true educated man must be free from any kind of dogmas, regionalism, parochialism and

caste etc. and one must have strong faith in equality, liberty, fraternity, secularism and integration. If education has to fulfill this function, it is absolutely to promote good conduct and values.

If we contemplate a moment to analyze whether we have really achieved the goals of education, we have to concede with a heavy heart that the progress is really not there. We have achieved quantitatively by multiplying the number of schools, colleges and universities but not qualitatively in shaping the products of these institutions. Tagore (1861-1941) has commented what we now call a school in this country is really a factory and the teachers are part of it. At half past ten in the morning, the factory opens with the ringing of a bell. Then the teachers stop talking at four in the afternoon when the factory closes and the pupils then go home carrying with them a few pages of machine made learning.

Cognitive Modeling

Cognitive models are appearing in all fields of cognition at a rapidly increasing rate, ranging from perception to memory to problem solving and decision-making.

Over 80% of the articles appearing in major theoretical journals of Cognitive Science involve cognitive modeling.¹ Furthermore, applications of cognitive modeling are beginning to spill over into other fields including human factors, clinical psychology, cognitive neuroscience, agent based modeling in economics, and many more.² Thus cognitive modeling is becoming an essential tool for Cognitive Science in particular and the Social Sciences in general, and any serious student with an inclination toward theory development needs to become a competent reader and perhaps user of these tools.

NEED AND SIGNIFICANCE OF THE STUDY

Even though pollution is introduced at the earlier level itself the students are facing difficulties in studying pollution. Most of the learners have a sense of fear towards organic chemistry. They have the feeling that pollution is an abstract subject. Researches in pollution focused that the students of pollution do not find sufficient motivation and inspiration in the study of the subject at the Higher Secondary level and large number of students are not attending pollution questions in the examinations due to lack of interest and understanding of basic concepts. Most of the researches emphasize that the study of pollution is essential in the development of country. Since pollution pervades all walk of life.

Elimination of distaste towards pollution among the students is the need of the hours. According to the Education Commission (1964 - 68) science has added a new dimension to education and to its role in the life of a nation, but central to all this is the quality of education. If science is poorly taught and badly learnt it is little more than burdening the mind with dead information and could degenerate even in it's a new superstition.

According to Park "The aim of Science teaching is not only the acquisition of information and skills but also to attain the understanding of the relationship between concepts and answers to problems".

SCOPE OF THE STUDY

In this competitive world, the students have to improve their problem solving skills with different methods of approach to solve any problem. The aim of the present study is to help the science teachers to improve the level of achievement of their students. This study will throw light on the cognitive functioning of information processing in solving problems in pollution and improvement of problem solving skills.

Development of problem solving ability by this modeling will enhance the educational achievement of the students. As proposed by the National Policy on Education (1986) there is an urgent need to modify curricula and methodologies of learning through appropriate research and development to incorporate elements of

problem solving, creativities and relevance. This study is attempted in those lines.

STATEMENT OF THE PROBLEM

The investigator tried all the traditional methods of teaching science but they did not yield the desired results on expected lines. So in the present investigation, the investigator intends to develop new innovative and effective instructional strategies for teaching pollution in the classroom through experimental study-in order to enhance the level of achievement of students in science. Hence the problem for the present study is stated as follows: Developing Cognitive Modeling Strategies in Enhancing Achievement in Environmental Pollution in Science Education

OBJECTIVES OF THE STUDY

- ★ To find out the effectiveness of cognitive model in science teaching.
- ★ To find out and compare the mean scores of the control and experimental group students in their gain scores.
- ★ To find out the achievement mean scores of the pre-test and post test scores of control group student.
- ★ To find out the achievement mean scores of the pre – test and post – test scores of experimental group students.

HYPOTHESES OF THE STUDY

1. There is no significant difference between the achievement mean scores of the pre-test and post – test scores of control group students.

2. There is no significant difference between the achievement mean scores of the pre-test and post-test scores of experimental group students.
3. There is no significant difference between the mean scores of the control and experimental group students in their gain scores.

METHODOLOGY

The investigator adopted experimental method as the study was experimental in nature. Experimentation is the name given to the type of Educational Research in which the investigator controls the educative factors to which a student or group of students are subjected during the period of enquiry and observes the resulting achievement. An experiment has three characteristics. An independent variable is manipulated. All other variables except the independent variables are held constant. The effect of the manipulation of the independent variable on the dependent variables is studied. There are different patterns of experimental research based on the groups used as individual or single group, parallel (or) equated groups and rotational groups. In this study the investigator adopted two or parallel group design.

The investigator selected the IX standard A-group students of K.A Higher Secondary School; the total number of students was 50. The Investigator divided the 50 students into two groups by matched pair procedure. One group was taken as control group and another group as experimental group.

Developing Cognitive Modeling Strategies

Strategy I (Focusing Attention)

1. The pollution problem is given to the students by dictating and writing.
2. The teacher focuses the attention of the students to the meaning of the problem.
3. The teacher sets the goal for solving the problem.

Strategy II (Information Gathering)

1. The teacher observed the variables with the help of the students.
2. The teacher asks question about the characteristics of each variable. The teacher gathers information with the help of students about the characteristics of each variable given in the problem.

Strategy III (Remembering)

The teacher with the help of students gathers the following information from the previous experiments.

1. The elements present in pollutions.
2. The functional causes present in pollution.
3. The possible effect for each pollution.

In this stage the teacher recalls the various types' pollutions.

Strategy IV (Organising)

The teacher organizes the information by comparing and classifying and find out the cause and effect of pollution with the help of the students.

Strategy V (Analysing)

The teacher analyses the attributes and components of the reactions given in the problem and relates this compounds with each other and find out the errors in achieving the concepts of pollution.

Strategy VI (Generating)

By inferring into the relationship between the different components of the problem the teacher predict the correct the types of the first pollution and elaborates his knowledge to identify the other compounds.

Strategy VII (Integrating)

The teacher integrates all the information given in the problem and the information obtained from his previous knowledge. The teacher finds out the reactants and products of each reaction given in the problem. He finds out the names of all the pollution with the help of the students.

Strategy VIII (Evaluation)

1. Teacher verified each finding by matching the types of pollution in with the cause and effect from the cues given for each pollution.
2. The teacher writes all the reactions with the help of students.

PROCEDURE AND DATA GATHERING

The investigator selected achievement tests as a tool to collect data through the pretest and post test. The pretest was

conducted among both control group as well as experimental group students. The performance of control group and the experimental group students was more or less the same. Experimental treatment was given to the experimental group. An ordinary treatment was gives to the control group. A post test was conducted among both the groups of students. To determine the effectiveness of experimental treatment a Post test was conducted on all the three topics covered through cognitive modeling strategy. The questions included both objective and descriptive types. 60% weight age was given to the objective type. The students of experimental groups were able to score better than the students of control group in the post test. Thus the effectiveness

of cognitive modeling strategies in enhancing achievement in pollution was established.

STATISTICAL TECHNIQUES USED

Different analysis method was used for data analysis. It provided inferences involving determination of statistical significance of difference between groups with reference to selected variables. Mean, standard deviation and ‘t’ test were used for this purpose.

DATA ANALYSIS

Hypothesis 1

There is no significance difference between the control group and experimental group students in their mean scores of pre test.

Table 1

Difference between the Mean Scores of Pre Test of Control Group and Experimental Group

Group	Number	Mean	SD	‘t’ Value		Remarks at 0.01 level
				Calc.	Table	
Control	25	17.88	2.28	0.58	2.71	Not Significant
Experimental	25	16.48	2.54			

Table 1 shows that the computed t value 0.58 is less than table value 2.71 at 0.01 level and hence it is not significant. Consequently, the null hypothesis is to be accepted. At it can be said that there is no significance difference between the control

group and experimental group students in their mean scores of pre test.

Hypothesis 2

There is no significance difference between control group and experimental group students in their mean scores of post test.

Table 2

Difference between the Mean Scores of post Test of Control Group and Experimental Group

Group	Number	Mean	SD	‘t’ Value		Remarks at 0.01 level
				Calc.	Table	
Control	25	19.48	2.03	11.35	2.71	Significant
Experimental	25	35.64	3.62			

Table 2 shows that the computed ‘t’ value 11.35 is greater than the table value 2.71 at 0.01 level and hence it is significant. Consequently, the null hypothesis is to be rejected. At it can be said that there is significance difference between control

group and experimental group students in their mean scores of post test.

Hypothesis 3

There is no significance difference between the mean scores of gain scores of control group and experimental group students

Table 3

Difference Between The Mean Scores of Gain Scores of Control Group and Experimental Group

Group	Number	Mean	SD	‘t’ Value		Remarks at 0.01 level
				Calc.	Table	
Control	25	24.75	1.89	8.08	2.71	Significant
Experimental	25	34.75	3.22			

Table 3 shows that the computed ‘t’ values 8.08 is greater than the table value 2.71 at 0.01 level and hence it is significant. Consequently, the null hypothesis is to

be rejected. As it can be said that there is significance difference between the mean scores of gain scores of control group and experimental group.

FINDINGS

- ★ The control group and experimental group students do not differ significantly in their performance in solving pollution problem before the treatment.
- ★ The performance of the experimental group students in solving pollution problems is greater than the performance of the control group students after the treatment.
- ★ The increase in performance of the experimental group students in solving pollution problems is greater than the increase in performance of the control group students after the treatment.

EDUCATIONAL IMPLICATIONS

This study reveals that if the teacher adopts cognitive Modeling strategy for teaching science, the tenth standard students will show marked improvements in their achievement examinations. This study reveals that the problem solving skill of the students is improved by the cognitive modeling strategy. This method makes the students to understand the method of solving organic problem more easier manner which motivates the students to study the concepts of pollution. This enhances their academic performance in pollution.

SUGGESTIONS FOR FURTHER RESEARCH

- ★ The present study was carried out to find the effect of cognitive Modeling on learning pollution. The similarity of the findings in other areas of science may be

identified and validated by conducting this study in other areas.

- ★ This study was conducted with the sample of students with High School level. The same study could be conducted with the sample of students with higher secondary and college level science as major discipline to find out the further impact of this study.
- ★ In this study only one branch of science was adopted according to the model for the particular standard. The model can be adopted all the other branches of science for all levels.
- ★ Then sample of study was taken from rural area. The same research can be conducted with the sample from various topographical areas to find out the effectiveness of the Model.
- ★ Problem solving skill is needed in all the areas of studies and in our day-to-day life. Hence research could be conducted to develop cognitive modeling in all branches of social and management studies.

CONCLUSION

The major purpose of this study is to develop new innovative and effective instructional strategy for teaching pollution at High school level so as to make the students understand the subject quite easily and enable them achieve good mark in the public examinations through this study the investigator found out the cognitive modeling method could be of much helpful to the teacher to teach pollution problems more effectively. The investigator believes that the same strategy may bring positive results if applied in the teaching of other branches of chemistry and other science subjects.

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ATTITUDE TOWARDS MULTIMEDIA PACKAGE AND ACHIEVEMENT IN PHYSICS OF SECONDARY SCHOOL STUDENTS IN KERALA BASED ON GENDER AND TYPE OF SCHOOLE

9

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INTRODUCTION

Many experiments and innovations have been conducted in the field of education and training regarding knowledge delivery. From face-to-face to virtual education, different technologies have played great roles at various times. In the last two decades, due to the advent of computer technologies, information delivery has got new meaning. Development, access, and transfer of text, sound, and video data have given a unique face to classrooms in the form of interactive multimedia programs. The present study finds out the relationship between attitude of secondary school students from various types of schools towards the multimedia package developed by the investigator and their achievement scores in Physics.

LITERATURE REVIEW

A study by Kumari (2000) on the impact of Computer Education on the Scientific Attitude of Students revealed that Computer Education has been found non-effective in the development of scientific attitude of the students and sex has not been found affecting the development of scientific attitude significantly. A meta-analysis of the relationship between

science achievement and science attitude was conducted by Willson (1983). The study shows that overall relationship is moderate (0.16), with differences between elementary, junior high, senior high, and college subjects and that sex differences exist through high school. According to Keeves (1992) and Postlethwaite and Wiley (1991), attitudes towards science are, in general, highly favoured, indicating strong support for science and the learning of science. Olatoye (2001) found that students attitude towards science have significant direct effect on student achievement in the subject.

NEED AND SIGNIFICANCE

Learning is primarily the process through which we become the human beings we are, and it takes place through a variety of media, strategies, and processes, of which interactive multimedia is just one. Using these media and technologies, we internalize information and knowledge available in the external world to construct our own experiences. Attitude of students can be influenced by the attitude of the teacher and his method of teaching. Studies carried out have shown that the

teachers' method of mathematics teaching and his personality greatly accounted for the students' positive attitude towards mathematics and that, without interest and personal effort in learning mathematics by the students, they can hardly perform well in the subject.

STATEMENT OF THE PROBLEM

The problem is entitled as "Attitude towards Multimedia Package and Achievement in Physics of Secondary School Students in Kerala based on Gender and Type of School"

OPERATIONAL DEFINITION TERMS

'*Attitude*' is defined as positive or negative emotional dispositions towards the prepared MMP.

'*Achievement*' is the knowledge or proficiency of the student in Physics, obtained after conducting an achievement test.

OBJECTIVE

To find the relationship between attitude towards Multimedia Package (MMP) and Achievement of Secondary School students in Kerala based on gender and type of school.

HYPOTHESES

1. There exists a significant difference between attitude of students with regard to multimedia package and achievement for the samples based on gender.
2. There exists a significant difference between attitude of students with regard to multimedia package and achievement for the samples based on type of school.

3. There is a relationship between attitude of students with regard to multimedia package and achievement for the samples based on gender and type of school.

METHODOLOGY

Survey method is adopted in the present study.

Tools Used

A multimedia package (MMP) was developed and standardized by the investigator on selected topics in Physics for standard VIII pupils. After learning from the package a multimedia package evaluation scale was administered on the students to find out the attitude of students towards the developed package. The achievement of students was measured using an achievement test developed by the investigator.

Sample

The sample consisted of 467 VIII class students.

STATISTICAL TECHNIQUES

Mean, standard deviation and t-test was calculated for the sample of boys and girls. Correlation was also calculated to find if there exists a relationship between attitude towards multimedia package and achievement in Physics.

DATA ANALYSIS AND INTERPRETATION

The value of the mean and standard deviation for attitude of students on MMP are 136.27 and 13.302. The value of mean and standard deviation for achievement

of students in Physics are 29.83 and 8.767 respectively.

Comparison of mean scores of Attitude of students on MMP and Achievement for the samples based on gender and type of school

For the investigation of whether any significant difference exist in the mean scores of Attitude of students on MMP and achievement for the samples of boys

and girls; government, aided and unaided schools; Mean and Standard Deviation were calculated separately for the samples. The whole samples were treated as large and independent.

The comparison of attitude with regard to MMP and achievement based on gender and type of school has been performed by t-test. The computed critical ratios are listed in a tabular form.

Table 1

Significance of difference between the mean attitude scores of students regarding MMP and achievement for the samples of Male and Female

Variable	Groups Compared	Number	Mean	SD	CR
Attitude	Male	217	134.1429	11.94791	-3.294
	Female	250	138.1200	14.13935	
Achievement	Male	217	28.5161	8.36444	-3.051
	Female	250	30.9640	8.96461	

The calculated critical ratio obtained for the difference of mean attitude and achievement score is 3.294 and 3.05 respectively, which is higher than the table value (1.96) for significance at 0.05

level. Hence the difference between the mean scores of attitude and achievement of male and female students is statistically significant at 0.05 level.

Table 2

Significance of difference between the mean attitude scores of students regarding MMP and achievement for the samples of Government and Aided School students

Variable	Groups Compared	Number	Mean	SD	CR
Attitude	Government	82	128.9878	9.82877	-8.471
	Aided	222	140.9910	13.57099	
Achievement	Government	82	27.4146	7.10234	-1.976
	Aided	222	29.3063	8.17876	

The calculated critical ratio obtained for the difference of mean attitude and achievement score is 8.471 and 1.976 respectively, which is higher than the table value (1.96) for significance at 0.05

level. Hence the difference between the mean scores of attitude and achievement of government school students and aided school students is statistically significant at 0.05 level.

Table 3

Significance of difference between the mean attitude scores of students regarding MMP and achievement for the samples of Government and Unaided School students

Variable	Groups Compared	Number	Mean	SD	CR
Attitude	Government	82	128.9878	9.82877	-3.147
	Unaided	163	133.5092	12.01510	
Achievement	Government	82	27.4146	7.10234	-3.933
	Unaided	163	31.7485	9.87911	

The calculated critical ratio obtained for the difference of mean attitude and achievement score is 3.147 and 3.933 respectively, which is higher than the table value (1.96) for significance at 0.05 level.

Hence the difference between the mean scores of attitude and achievement of government school students and unaided school students is statistically significant at 0.05 level.

Table 4

Significance of difference between the mean attitude scores of students regarding MMP and achievement for the samples of Aided and Unaided School students

Variable	Groups Compared	Number	Mean	SD	CR
Attitude	Aided	222	140.9910	13.57099	5.713
	Unaided	163	133.5092	12.01510	
Achievement	Aided	222	29.3063	8.17876	-2.574
	Unaided	163	31.7485	9.87911	

The calculated critical ratio obtained for the difference of mean attitude and achievement score is 5.713 and 2.574 respectively, which is higher than the table value (1.96) for significance at 0.05 level.

Hence the difference between the mean scores of attitude and achievement of aided school students and unaided school students is statistically significant at 0.05 level.

Table 5

Correlation between Attitude towards MMP and Achievement in Physics

Sample	N	r	t value	p-value
Total	467	0.3276	7.4753	0.00
Male	217	0.4981	8.4225	0.00
Female	250	0.1874	3.005	0.0029
Aided	222	0.3581	5.6883	0.00
Unaided	163	0.2734	3.6069	0.004
Government	82	0.6594	7.8447	0.00

The correlation between attitude towards MMP and achievement in Physics is significant for the total sample. There is also significant positive correlation between male, female, aided, unaided and government samples.

FINDINGS

- ★ The attitude scores of female students with regard to the MMP is higher than that of male students. There exists significant difference in the attitude of male and female students with regard to MMP.
- ★ The achievement scores of female students is higher than that of male students. There exists significant difference in the achievement of male and female students.
- ★ The attitude scores of the government school students is lower than that of the aided school students. There exists significant difference in the attitude of government and aided school students with regard to MMP.
- ★ The achievement scores of aided school students is higher than the achievement scores of government school students. There exists significant difference in the achievement of government school students and aided school students.
- ★ The attitude scores of the government school students is lower than that of the unaided school students. There exists significant difference in the attitude of government and unaided school students with regard to MMP.
- ★ The achievement scores of unaided school students is higher than the achievement scores of government school students. There exists significant difference in the achievement of government school students and unaided school students.
- ★ The attitude scores of the unaided school students is lower than that of the aided school students. There exists significant difference in the attitude of unaided and aided school students with regard to MMP.

- ★ The achievement scores of unaided school students is higher than the achievement scores of aided school students. There exists significant difference in the achievement of aided school students and unaided school students.
- ★ There is a relationship between attitude of students with regard to multimedia package and achievement for the total sample.

CONCLUSION

Nowadays learning experience tends to be a blend of various technologies. The researcher has developed a multimedia package for teaching of selected topics in Physics. The educational benefits offered by multimedia technology include the ability to take users into environments

otherwise inaccessible by conventional methods, create a dynamic and interactive environment for learning, the high memory retention of experience, and the ability to reach out to visually oriented learners. Most of the studies agree that attitude is an important correlate of achievement and it can be used as a good predictor of achievement. So the investigator found that it is needed to study the nature of relationship between attitude towards the MMP and the achievement of students in Physics after learning through the same package. The results support previous research that there exists relationship between attitude and achievement of students. Teachers can also note the differences in attitude among gender so as to maximize learning of each individual in the class.

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COMPUTER BASED SIMULATION- EFFECTIVE LEARNING MEDIA

10

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Computer based simulation is a form of learning with computers in which the user may experiment in a simulated situation. This simulation strongly resembles reality or in a deliberate simplification. Computer simulation enables students to make decisions without great risks. As a result of the decisions made the computer reacts with informative feedback. This feedback is almost always of a visual nature. Visual feedback is an important characteristics of computer simulation. Therefore, a computer simulation program often has the characteristics of an animation program. Computer simulation programs are multimedia programs. The instructional situation of the computer simulation offers the teacher the possibility to provide experimentation with the subject matter in an ordered way. Moreover it can make it easier to realize goals set before hand.

Simulation can enable learners to ground cognitive understanding of their action in a situation. (Thomas and Milligan, 2004; Laurillard, 1993). The principal caveat of simulations is that students rather engage with the interface than with the underlying

model (Davis, 2002). As a numerical model of a system, presented for a learner to manipulate and explore, simulations can provide a rich learning experience for the students. They can be a powerful resource for teaching; providing across to environments, which may otherwise be too dangerous, or impractical due to size or time constraints; and facilitating visualization of dynamic or complex behaviour. (Thoms and Milligan, 2004).

In computer based instructional simulations, learners learn by actually performing the activities to be learned in a context that is similar to the real world. CBI simulations could simplify the world in which learners solve problems, learn procedures and come to understand the characteristics of phenomena. CBI simulations are useful in situations that are dangerous to operate (e.g. flight experiments or chemical experiments), subject to failure when used incorrectly (e.g., medical operations), costly to maintain (e.g., army training), difficult to set up (e.g., biology experiments) or difficult to observe in operation (e.g., socio-

economic phenomena). Simulations not only motivate learners but they also learn by interpretation in a manner similar to the way they would react real situations. CBI simulation is among the most powerful educational delivery method because computer based instructional simulations provide situated, authentic form of practice, feedback about performances, depictions of how a device or system works and motivation for learning while avoiding physical danger and constraints. In support of the importance of teachers' attitude towards computer use, Zhao, Tan and Mishra (2001) provided evidence to suggest that the attitudes of teachers are directly related to computer use in the classroom. The success of student learning with computer technology will depend largely on the attitudes of teachers and their willingness to embrace the technology (Teo 2006). The pre-service teachers in his/her sample had reduced computer anxiety, higher estimation of their own computer skills and more positive thoughts and filling related to computers after completing a basic computer course (Hakkinen ;1995). The female teachers were found to have a more favourable attitude towards computer education in secondary schools than male teachers (Panday, Shubhra ; 1991). Teacher trainees, teacher and principals keep a positive attitude towards computer programme (Pareek, R. 2005). The students

and the teachers were found to have positive attitude towards the video instructional programme (Vekaria,V.J. 2002).

NEED AND IMPORTANCE

Computer-based instructional simulation does not mean to train the learners how to operate computers. It rather means that students will take the help of computer in their learning. The main purpose of multimedia programme is to provide individual instruction to student keeping in view their personal abilities and interests.

Computer-based instruction is needed and important because whatever knowledge a learner obtained through CBI is well organised and is according to the needs of learners. Learning which takes place through CBI was found to be effective. Though many studies have been carried out to study the effectiveness of CBI at school level but at teacher training level this is still lacking. Review of literature reveals that lot of work has been done to evaluate the effectiveness and use of CAI, and computer, based instruction in learning process. . In most of the studies CBI found to be more effective, which reflect the positive impact CAI/CBI on part of learners interest. But as the area of in-service and pre-service teachers' attitude towards CAI/CBI is still unexplored so researcher decided to work in the same.

OBJECTIVES OF THE STUDY

- ★ To compare the attitude of male and female school teachers towards computer based instructional simulations in education.
- ★ To compare the attitude of government and private school teachers towards Computer-based instructional simulations in education.
- ★ To compare the attitude of In-service and Pre-service teachers towards Computer-based instructional simulations in education.

HYPOTHESES OF THE STUDY

1. There is no significance difference in the attitude of male and female school teachers towards CBI simulations in education.
3. There is no significance difference in the attitude of the government and private school teachers towards CBI simulations in education.
3. There is no significance difference in the attitude of In-service and Pre-service teachers towards CBI simulations in education.

METHODOLOGY

Survey method was used for the purpose of the present investigation.

Sample and sampling technique

The investigator selected two educational collages and thirteen Government and private secondary schools of Sonapat district for the present study a total of 100 In-service and Pre-service teachers were selected by using convenience sampling technique.

Tool used

Computer Based Instructions – Attitude Scale (CBIAS), was developed by the investigator.

Procedure of data collection

The teacher was given opinionnaire with giving instructions to fill it properly without leaving any statement. The rather has marked tick (✓) sign either one of the three point scale test. The filled up opinionnaire were collected to analyze and interpret the data so as to evaluate the necessary conclusion.

Scoring

The scoring of the attitude scale was done accordingly; Agree – 3, Can't say – 2, and disagree – 1, mark respectively.

Statistical Techniques Used

Mean, SD and t-test were used to analyze the whole data.

DATA ANALYSIS

In order to make the data more meaningful following interpretation tables were discussed.

Table 1

Mean, SD and t-value of male and female teachers for 'Teachers Attitude towards Computer Based Instruction Scale' score

S. No.	Dimensions		Mean	SD	't' Value
1.	Teacher's Preparation	Male	26.42	2.38	0.20
		Female	26.63	2.65	
2.	Teaching learning process	Male	20.21	1.60	1.12
		Female	19.85	1.63	
3.	Effectiveness in terms of students achievements	Male	22.75	2.76	2.5
		Female	21.5	2.28	
4	Scope of computer in school education	Male	20.66	1.34	3.1
		Female	19.73	1.56	

*Significant at 0.01 level **Significant at 0.05 level ***Non Significant at 0.01 level

The table depicts that the difference in the attitude of male and female school teachers towards CBI is significant at 0.05 levels in dimensions effectiveness in terms of students' achievements and scope of computer in school education but non-significant in teachers' preparations and teaching learning process. And it can be said that males have more positive attitude towards CBI as compared to female teaches.

Table 2

Mean, SD and t-value of Government & Private school teachers for 'Teachers Attitude towards Computer Based Instruction Scale' score

S. No.	Dimensions		Mean	SD	't' Value
1.	Teacher's Preparation	Government	27.00	2.26	0.73
		Private	26.44	3.17	
2.	Teaching learning process	Government	20.32	1.64	1.06
		Private	19.8	1.87	
3.	Effectiveness in-terms of students achievements	Government	21.36	2.23	2.12
		Private	22.63	2.18	
4.	Scope of computer in school education	Government	19.96	1.48	1.55
		Private	20.52	1.09	

*Significant at 0.01 level **Significant at 0.05 level ***Non Significant at 0.01 level

The table reveals that the difference in the attitude of government and private school teachers towards CBI is significant at 0.05 level in dimension Effectiveness in terms of students achievements but non significant in Teachers preparation,

Teaching learning process & Scope of computer in school education. And it can be said that private school teachers have more positive attitude towards CBI as compared to government school teachers.

Table 3

Mean, SD and t-value of In-service and Pre-service teachers for ‘Teachers Attitude towards Computer Based Instruction Scale’ score

S. No.	Dimensions		Mean	SD	t' Value
1.	Teacher's Preparation	In-Service	26.72	6.58	0.30
		Pre-service	26.34	6.07	
2.	Teaching learning process	In-Service	19.86	1.22	1.18
		Pre-service	20.18	1.48	
3.	Effectiveness in-terms of students achievements	In-Service	22.02	2.29	0.36
		Pre-service	22.18	2.09	
4	Scope of computer in school education	In-Service	20.24	1.34	0.4
		Pre-service	20.12	1.70	

*Significant at 0.01 level

**Significant at 0.05 level

The table depicts that the difference in the attitude of In-service and Pre-service teachers towards CBI is non significant at 0.05 level in all the dimensions. And it can be said that In-service teachers has more positive attitude towards CBI as compared to Pre-service teachers.

MAJOR FINDINGS

- ★ Male teachers posses more positive attitude towards CBI as compared to female teachers.
- ★ Private school teachers posses more positive attitude towards CBI as compared to Government school teachers.

- ★ In-service teachers posses more positive attitude towards CBI as compared to Pre-service teachers.

FINDINGS

The finding of the present study that Male teachers posses more positive attitude towards CBI as compared to female teachers is in contradiction with the findings of earlier study carried out by Pandey, Shubhra (1991). The second finding i.e. Private school teachers posses more positive attitude towards CBI as compared to Government school teachers and this is supported by the earlier study done by Pareek, R.(2005). The third finding

i.e. In-service teachers possess more positive attitude towards CBI as compared to Pre-service teachers and this is contradicted by Hakkinen (1995) work.

Authors possess positive attitude towards CBI and believe that CBI facilitates the cognitive development of learner in terms of conceptualization (Thomes and Milligan 2004; Laurillard, 1993). Further CBI strategy is potent enough to engage the learner (Davis, 2002) which is essential tool for any effective teaching strategy. CBI strategy creates a real like situation which further helps the learner to develop realistic concepts without facing any time or size constraints (Thomes and Milligan, 2004).

EDUCATIONAL IMPLICATIONS

- ★ This study will motivate the In-service and Pre-service teachers to use computer-based instruction in order to make their teaching effective.
- ★ This study will encourage teachers and teacher tutors to use the CBI material as a supplement to general teaching.
- ★ CBI caters individualized needs of general as well as special students.
- ★ This study will motivate the teachers to develop CBI packages as to facilitate the learners and understand information at their own pace and academic performances as well.
- ★ This study favours the training of future teachers for development and use of CBI

material so teacher training institutions can work for the purpose.

LIMITATIONS

Due to restricted time and scope researcher limited the study to Sonipat locality with sample size N=100 on school teachers as subjects. Further study with wide scope, sample and different level of educational, professional can be carried out.

CONCLUSION

The present study is of greater importance in present days as these in growing realization of the children. This study reveals that there should be instruction with computer in school and colleges. For this purpose attitude of teaches should be considered. The topic of computers based instruction should be included in the curriculum of the teachers training colleges of every level, so that the teacher may be familiar with this concept. Computer simulations can use strategies effective for supporting student learning about the task, when people know the accurate meaning and utility of learning methods, they can chose the best methods for specific learning objectives. Technology can be used to reduce teaching loads and provide educations with some unplugged time. Technology is the need of today and its implementation is essential. Teachers as well as students should be given appropriate and adequate training for their bright future.

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