ISSN 0973-6190

JERE

Journal of Educational Research and Extension

Peer Reviewed Quarterly Journal with impact factor

Vol.56, No.3 - July to September 2019

SRI RAMAKRISHNA MISSION VIDYALAYA
COLLEGE OF EDUCATION (AUTONOMOUS)
COIMBATORE - 641 020.

EDITORIAL BOARD

ISSN 0973-6190

VOL. 56 (3) JULY-SEPTEMBER 2019

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JOURNAL OF EDUCATIONAL RESEARCH AND EXTENSION

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Published by :

Sri Ramakrishna Mission Vidyalaya College of Education
(Autonomous), Coimbatore - 641 020
Phone No.: 0422 - 2692441 Fax: 0422 - 2694572
e-mail: srkvcoejere@gmail.com

Printed at :
Ramakrishna Mission Vidyalaya Printing Press

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Dr. P. THIRUSELVI
Assistant Professor
Michael Job Memorial College of Education for Women
Near Sulur Boat Lake, Ravathur Post
Sulur, Coimbatore - 641103

MATHEMATICS IN THE STUDY OF SELECT POLYTECHNIC COURSES: REQUISITES AND PROVISIONS

1

Dr. G. SANTHI
Principal, Sri Sarada College of Education,
Ulundurpet, Villupuram - 606107

INTRODUCTION

Mathematics has been defined as the science of measurements, quantity and magnitude. It is the science of logical thinking and reasoning. Its inferences, results and conclusions are based on a definite process of logical reasoning and thinking. Mathematics is an abstract science. Mathematics plays a great role in our lives. We are living in a world of measurements of Mathematics which are linked to the prosperity of the state. It has been found that the progress of nations in this modern age depends largely upon their advancements in the fields of mathematics and science. Role of pure and applied mathematics as a key subject to science and technology is well established. Bacon rightly observed that "Mathematics is the gateway and key of all science." In modern times every country needs to develop its resources in all directions. These are the same in all developed and developing countries. The approach may vary from country to country but the aims are the same. This means that there is a growing need in all societies for many scientists, engineers, economists, statisticians and experts on various technologies and other fields. To do their work efficiently, they should have a proper knowledge in Mathematics.

NEED OF THE STUDY

The utility of Mathematics in life cannot be over emphasized. For gaining such mathematics knowledge, the provision for the study of Mathematics as a subject at school level needs no justification. The pass holders of tenth standard get diversified in the form of either entry into world of work or getting admitted in further courses. One such further course in to which they get into is polytechnic course. Needless to state that, polytechnic courses involve a lot of mathematical concepts, since they are all engineering and technology based. The designers of these courses have provided the scope for learning mathematics in the first year of polytechnic courses also due to the non-possibility of meeting all the mathematical requirements at school level itself. Though the students have been subjected to mathematical learning in school as well as in the first year of polytechnic courses, it has not yet

been ascertained empirically till date, whether the provision of Mathematics is enough for learning subject papers of these courses.

BACKGROUND OF THE PROBLEM

The personal experience of handling of Mathematics and first hand acquaintances with the problems faced by the polytechnic students made to think about the assessment of the mathematics knowledge in the learning polytechnic courses. Hence the present study is entitled "MATHEMATICS IN THE STUDY OF SELECT POLYTECHNIC COURSES: REQUISITES AND PROVISIONS".

REVIEW OF LITERATURE

A study by Krishnan (1981) reveals that the school mathematics and science curricula are developed in a correlated method to some extent in the states of Kerala as well as TamilNadu.

An analysis of the mathematical concepts involved in learning Biology and in the teaching of concepts in mathematics classes by Krishnan and P.F.Jothi (1987)reveals that five out of the twelve mathematical concepts used in biology are-not taught in mathematics classes. This shows that the provision of mathematical background in secondary school mathematics programme for the learning of biology at +2 stages and the degree stage is not adequate.

A study on "Co-ordination among school mathematics,Physics,Chemistry, Biology, History, Geography, Political science, Economics, Commerce and Psychology" by Krishnan(1987)reveals that students may face difficulties in the learning of Physics at higher secondary stage for want of background in Mathematics.

Further it reveals that children may find it difficult to learn Geography for want of background in Mathematics at primary stage.

The literature presented here enabled the investigator to design a qualitative study and execute it scientifically.

OBJECTIVES

1. To identify the mathematical requisites in the learning of select polytechnic courses.

2. To ascertain the coverage and non-coverage of the identified mathematics requisites in the Mathematics of standard I to X and in the Mathematics papers of the polytechnic courses.

3. To compute the adequacy ratios for the different papers in a course and for the course as a whole.

OPERATIONAL DEFINITIONS

Select polytechnic courses:- refers to the courses, Diploma in Electrical and Electronics Engineering, Diploma in Communication Engineering and Diploma in Mechanical Engineering.

Requisites:- refers to the curricular elements like concepts, principles, and methods in mathematics which are involved in the subjects of polytechnic courses.

Provisions:- refers to the coverage of the curricular elements like concepts, principles and methods in the school mathematics (1 to X) as well as in the mathematics papers in the first year of polytechnic courses.

METHODOLOGY

The content analysis as a method of research was used.

Scope of the study

The analyzing of the documents in terms of adequacy of Mathematics for the learning of polytechnic subjects would pave way for corrective measures based on the weakness notices, if any.

Collection of curricular documents:

Syllabi of I to X standard text books prescribed by Tamil Nadu government.

Syllabi of Mathematics for Polytechnic courses prescribed by Directorate of technical education, Government of Tamil Nadu.

Documents analyzed

1. The mathematical documents, viz. syllabi and text books prescribed for Mathematics for standard I to X by the Government of TamilNadu and the mathematics syllabus meant for the mathematics papers of polytechnic courses.

2. The syllabi of subject papers of the three polytechnic courses.

QUALITATIVE TECHNIQUE USED

The adequacy ratios were computed using the formula,

$$\text{Adequacy Ratio} = \frac{\text{Number of mathematics elements taught in school and polytechnic mathematics}}{\text{Total number of mathematics elements involved in the subject of Polytechnic courses}}$$

Identification of provisions and requisites

The Mathematical curricular elements taught in school standards and Mathematical curricular elements taught in the first year Mathematics papers of polytechnic courses were checked in terms of the Mathematical curricular elements involved in the learning of the subject papers, during the second and third year of the polytechnic courses.

The Mathematical curricular elements like terms, concepts, principles, laws, theories and methods involved in the learning of the subject papers of polytechnic courses viz, DEEE, DCE, DME were analyzed and identified.

Computation of adequacy ratios

$$\text{Adequacy Ratio} = \frac{\text{Number of mathematics elements taught in school and polytechnic mathematics}}{\text{Total number of mathematics elements involved in the subject paper}}$$

Table - 1

Course	Semester	Adequacy ratio
DEEE	III	0.98
DEEE	IV	1
DEEE	V	1
DEEE	VI	1

From the Table - 1, Adequacy Ratio for the III semester is 0.98.Hence the provision of mathematical background in school and the first year polytechnic courses for the learning subjects in DEEE is highly satisfactory.

Adequacy Ratio for the IV, V, and VI semester is 1.Hence the provision of mathematical background in school and the first year polytechnic courses for the learning subjects in DEEE is Excellent.

Adequacy Ratio for the course = (Semester III+ Semester IV +Semester V+ Semester VI)/4)

=(0.98+1+1+1)/4

=3.98/4=0.99

Hence the provision of mathematical background in school and the first year of polytechnic courses for the learning of subjects in DEEE are excellent.

Table - 2

Course	Semester	Adequacy Ratio
DCE	III	1
DCE	IV	0.95
DCE	V	0.95
DCE	VI	0.98

From the Table - 2, Adequacy Ratio for the III semester is 1. Hence the provision of mathematical background in school and the first year polytechnic courses for the learning subjects in DCE is Excellent.

Adequacy Ratio for the IV, V semester is 0.95 and VI semester is 0.98. Hence the provision of mathematical background in school and the first year polytechnic courses for the learning subjects in DCE is highly satisfactory.

Adequacy Ratio for the course = (Semester III+ Semester IV +Semester V+ Semester VI)/4

= (1+0.95+0.95+0.98)/4

=3.88/4=0.97

Hence the provision of mathematical background in school and the first year of polytechnic courses for the learning of subjects in DCE are highly satisfactory.

Table - 3

Course	Semester	Adequacy ratio
DME	III	0.97
DME	IV	0.98
DME	V	0.97
DME	VI	0.99

From the Table - 3, Adequacy Ratio for the III,IV,V,VI semester is 0.97, 0.98, 0.97, 0.99. Hence the provision of mathematical background in school and the first year polytechnic courses for the learning subjects in DME is highly satisfactory.

Adequacy Ratio for the course = (Semester III+ Semester IV +Semester V+ Semester VI)/4

= (0.97+0.98+0.97+0.99)/4

=3.9/4=0.97

CONCLUSIONS

The major conclusion emerged out of the present study is that the provision of mathematical background in school and in the first year mathematics papers of polytechnic courses is found to be excellent for the learning of DEEE course and highly satisfactory for the learning of DCE and DME courses covered in the present study.

EDUCATIONAL IMPLICATIONS

The study reveals that the following mathematical curricular elements, viz, Rectangular Hyperbola, Helical, Successive Approximation, Harmonic series, Octal Number, Hexadecimal Number, Bessel function, Gaussion Distribution, Trapezium, Bessel Differential Equations, Parallel Axis Theorem, Area of Trapezium, Hallow surface, Buckhinghum Equation, Lewis Equation, Tangent of Helix which are involved in the learning of polytechnic subject papers are not found covered either in school mathematics or in polytechnic first year Mathematics. These should be taught by conducting a capsule course to polytechnic students before their entry into second year.

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ISSN: 0973-6190

EFFECT OF BLENDED LEARNING STRATEGY ON PROBLEM SOLVING SKILL OF HIGHER SECONDARY COMMERCE STUDENTS

2

K. SUPRABHA
Assistant Professor
N.S.S. Training College
P.B. No. – 3, Ottapalam
Palakkad, Kerala- 679101

INTRODUCTION

Education is a comprehensive process and imparting the classroom instruction is one of the several means to achieve the goals of education. Technology can refer to material objects use to humanity, such as machines or hardware but it can also encompass broader themes including systems, methods of organization and techniques. The technology of instruction may be regarded as a part and section of the whole phenomenon of technology of education. The term educational technology is often associated with and encompasses instructional technology and learning theory. While instructional technology covers the processes and systems of learning and instruction, educational technology includes other systems used in the process of developing human capability. Thus educational technology is concerned with the scientific use of the available human and non-human resources for solving various problems of education (including instruction) for optimizing the result of the whole teaching-learning process (Mangal, 2009).

NEED AND SIGNIFICANCE OF THE STUDY

Social behaviours, broadly considered as skills to be taught, and the emphasis is placed on building adaptive and new behaviours rather than on eliminating problem behaviours. The advantage of a problem solving skill approach to treating children with problems is that it is essentially a positive approach, which assumes that children can be taught the skill necessary to behave in different situations in an acceptable manner. We have convinced that social behaviours can and should be specially taught as part of a school curriculum, and that the skills of such teaching should be in the repertories of all teachers.

Blended learning is a mix of pedagogical approach that combines the effectiveness and the socialization opportunities of the classroom with the technological enhancement of online learning. Blended learning increases the

interaction between the instructor and the student, integrating formative and summative feedback in order to boost student learning experiences. Therefore, blended learning is a fundamental redesign of the instructional model with a shift from lecture-centred to student centred instruction where students are active and interactive learners.

STATEMENT OF THE PROBLEM

The study was intended to find out the effect of blended learning instructional strategy in developing problem solving skill among higher secondary commerce students and their engagement within a constructive blended learning environment. The study is thereby entitled as 'Effect of Blended Learning Strategy on Problem Solving Skill of Higher Secondary Commerce Students'.

OBJECTIVE OF THE STUDY

To study the effect of blended learning instructional strategy over constructivist teaching strategy on problem solving skill of higher secondary commerce students.

HYPOTHESES OF THE STUDY

- Mean pre-test scores of problem solving skill will not differ significantly between the experimental group and control group.
- Mean post-test scores of problem solving skill of the experimental and control group will differ significantly, with advantage to the experimental group.
- Mean gain scores of problem solving skill of the experimental and control group will differ significantly, with advantage to the experimental group.
- Mean gain scores of problem solving skill of the experimental and control group will differ significantly, with advantage to the experimental group when the effect of pre-test score is controlled.

METHODOLOGY IN BRIEF

The study employs pre-test post-test non-equivalent control group design under the quasi-experimental method for experimentation. The instructional strategies-blended learning instructional strategy and constructivist teaching strategy were treated as the independent variable and the problem solving skill as the dependent variable. The pre-test scores alone had taken for control variable.

SAMPLE

Being an experimental study, the investigator randomly selected two intact groups of 40 students each of standard XII class from a school in Thrissur District as the representative of the higher secondary schools of Kerala.

TOOLS

The investigator used following tools in the study.

1. Tests on problem solving skill (Suprabha & Subramonian, 2014)

2. Lesson transcript based on blended learning and constructive teaching strategy for teaching commerce (Suprabha & Subramonian, 2014)

STATISTICAL TECHNIQUES

The following statistical techniques were employed for the study

- Descriptive analysis
- Mean difference analysis
- ANCOVA

ANALYSIS AND INTERPRETATION

Following preliminary analysis employed for normality assumptions, subjected to parametric statistical analysis of the data. The results obtained were provided in the sections below.

PRELIMINARY ANALYSIS

The basic descriptive statistics calculated for the pre-test, post-test and gain scores on the dependent variable for the experimental group and control group is provided in Table .1

Table 1

Descriptive Statistics for the Pre-test, Post-test and Gain scores on Problem Solving Skill of the Experimental group and Control group

Scores	Group	Mean	Median	Mode	Standard Deviation	Skewness	Kurtosis
Pre-test	Experimental	19.88	20.00	21	1.71	.31	.98
	Control	19.68	20.00	18	1.91	.01	.83
Post-test	Experimental	22.78	22.50	22	1.18	.65	.79
	Control	20.43	21.00	20	1.89	.53	.57
Gain score	Experimental	2.90	3.00	2	1.85	-.02	-.75
	Control	0.75	0.00	0	2.53	-.23	.004

From Table 1, mean, median and mode of pre-test scores of problem solving skill are almost equal for the experimental and control group. The indices of skewness and kurtosis indicate that the distribution is slightly negatively skewed and leptokurtic; which indicate that the pre-test scores of problem solving skill of experimental and control group before the experimental intervention do not significantly deviate from normality.

The post-test scores of problem solving skill are almost equalled for experimental and control group. The indices of skewness and kurtosis of experimental group indicate that the distribution is slightly positively skewed and platykurtic; which indicate that

the post-test scores of problem solving skill after intervention is normally distributed.

The data revealed that the gain scores of the problem solving skill for the experimental group and control group is slightly positively skewed and platykurtic. The normal Q-Q plots of gain scores of the experimental and control groups revealed that there is no serious deviation from normality of the data, permits for parametric tests to be conducted on the data.

ANALYSIS OF GROUP DIFFERENCES

Comparison of mean scores was carried out to test whether significant difference exist between the mean pre-test scores, post-test scores and gain scores of the experimental group and control group in the dependent variable; problem solving skill. Two-tailed test of significance of difference between the mean scores was used for comparison and the results are given in Table 2.

Table 2

Data and results of the Test of Significance of Difference between the Mean Pre-test Scores, Post-test Scores and Gain scores on problem Solving skill between Experimental group and Control group

Scores	Group	N	Mean	SD	t-value	Level of Significance
Pre-test	Experimental	40	19.88	1.71	0.49	NS
	Control	40	19.68	1.91		
Post-test	Experimental	40	22.78	1.18	6.65	.05
	Control	40	20.43	1.89		
Gain Score	Experimental	40	2.90	1.85	4.34	.05
	Control	40	0.75	2.53		

The two-tailed t-test performed to estimate the significance of difference between the mean pre-test scores of experimental and control group in problem solving skill showed that it doesnot differ significantly. Thereby the two groups can be equated in terms of their problem solving skill before intervention.

The test of significance of difference between the mean post-test scores of experimental group and control group in problem solving skill showed that there is significant difference between the mean post-test scores of the two groups with advantage to the experimental group. The effect size indicates that the effect of blended

learning strategy on problem solving skill is large.

Result of t-test performed to estimate the significance of difference between the mean gain scores of experimental group and control group in problem solving skill showed that there is a significant difference between the mean gain scores of the two groups in their problem solving skill, with advantage to the experimental group.

ANALYSIS OF GENUINENESS OF THE DIFFERENCES

Since the design for experimentation was selected as pre-test post-test non-equivalent control group design, it was necessary to analyze the data using the statistical technique of Analysis of Covariance (ANCOVA) in which the initial difference was removed statistically. Though the gain score results analysis yielded more clear that in the post-test analysis, the investigator intended to nullify the effects of pre-test differences in the gain scores analysis, if any. The statistical technique of ANCOVA was employed to test the data; the results are given in Table 3.

Table 3

Summary of ANCOVA on Gain Scores in Problem Solving Skill of students in Experimental group and Control group

Variable	Source of Variation	SSx	DF	MS	F	Level of Significance
Problem Solving Skill	Between	81.419	1	81.419	59.291	.05
	Within	133.600	39	1.373		
	Total	470.000	40			

From Table 3 it is evident that there is significant difference between the mean gain scores of experimental group and control group on problem solving skill, after controlling the pre-test scores. The F-value obtained for mean gain scores difference in problem solving skill between experimental group and control group after controlling pre-test scores is 59.29, which is significant at 0.05 level.

MAJOR FINDINGS OF THE STUDY

- The experimental group and control group showed no significant difference in their pre-test scores of problem solving skill before experimentation.

- The experimental group taught through blended learning instructional strategy scored significantly more on the post-test scores of problem solving skill when compared to the control group.
- The experimental group taught through blended learning strategy had significantly higher gain scores on problem solving skill when compared to the control group.
- In terms of gain scores, the effect of blended learning instructional strategy on problem solving skill of students in experimental group performed higher than to students in control group, after controlling their pre-test sores on problem solving skill.

EDUCATIONAL IMPLICATIONS OF THE STUDY

This study has demonstrated the advantage of blended learning instructional strategy on problem solving skill of students in a regular commerce classroom. Blended learning strategy is a learner centred strategy, so the learners at higher secondary level refresh their cognitive structure and up to date their knowledge on their space. The specific contribution of this study provided empirical evidences to show that blended learning strategy has positive impact on students' achievement in problem solving ability. During the instruction in groups, blended learning strategy develops the communication skills among the learners.

In the light of the findings of the study, the investigator suggests the need to practice blended learning strategy as a good teaching learning strategy at higher secondary level. As it is one of the modes of e-learning, blended learning useful for planning and analysing the curriculum at higher secondary level and identifying the gaps where e-learning needed in the curriculum. Blended learning strategy is more helpful to teachers and learners in understanding the concepts in Commerce and applying it in to another field.

CONCLUSION

In the study, the superiority of blended learning strategy over constructive teaching strategy on problem solving skill of the pupil is evident from the study. During the blended learning environment, students are actively engaged in learning process with the help of computers in a synchronised and asynchronies modes through discussion, sharing and interpretation of ideas between peers. Blended learning strategy can serve as the basis for a variety of strategies like e-learning, M-learning etc. that enhance the teaching learning process. Blended learning mode like e-content can be used to support teachers and students efforts to their personal

understanding about the specific knowledge, conceptual understanding and application abilities of the concepts learned. In contrast, blended learning is applied in a flexible environment with the help of computers, desired modifications and refinements can easily be integrated in to the learning process.

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ISSN: 0973-6190

EFFECT OF TRADITIONAL TRAINING WITH AND WITHOUT LADDER TRAINING ON BALANCE ABILITY OF HIGH SCHOOL KHO- KHO PLAYERS

3

M. ASHOK KUMAR
Ph.D., Research Scholar,
Ramakrishna Mission Vivekananda Educational and Research Institute, GAPEY,
Coimbatore - 641020

Dr. S. SIVASANKAR
Director of Physical Education,
Sri Ramakrishna Mission Vidyalaya College of Education, (Autonomous)
Coimbatore - 641020

INTRODUCTION

Sports can be a positive experience for our body and mind. Outdoors activities and games are essential for everyone. Let a person explore go trekking with his friends, encourage him to play, run around, jump etc and these activities are an essential way out physical energy. Sports derive its roots, meaning from disport meaning to divert oneself.

KHO-KHO

Kho-kho is one of the most popular traditional sports in India. Though it's difficult to trace its origins, it is believed to have originated in Maharashtra. Kho-Kho a game of Indian origin is dominated by speed and nerve control. It is based upon natural principles of physical development and instills a healthy combative spirit in the person. Kho-Kho is said to be as old as the Mahabharata times. The word Kho is derived from the Sanskrit verb "Syu" which means "get-up-go". Kho-Kho is played in two innings by 12 nominated players out of 15 players. Initially 9 players start the game and 3 are kept in reserve. Each team chases and defends for 9 minutes twice in a match. Kho-Kho has however, failed to live up to the glamour and speed of modern days sports. It suffers from a strange dilemma of whether to retain the rustic spice or add the glamour quotient to the game.

The sport, with a loud, barefoot and sandy combination, thrives in rural areas. The national games are normally held in villages or in tiny interior pockets. However, they are still successful in drawing big crowds. But often, it is shunned by television and fails to attract sponsors. Kho-kho thrives on stamina and fortitude. You need to be very alert for the constant take-off when a 'kho' is given. You have to spring to your start while also strengthening your leg muscles. The federation of kho-kho

is called Kho-Kho Federation of India (K.K.F.I).

TRAINING

The training process comprises of a series of steps that needs to be followed systematically to have an efficient training programme. The training is a systematic activity performed to modify the skills, ability and talent.

A tradition is a belief or behaviour passed down within a group or society with symbolic meaning or special significance with origins in the post. (Thomas A. 1997). Generally Traditional training is the past generation player or coach framed some basic technique or training methods the current generation will be followed day by day in the traditional game.

BALANCE

In biomechanics, balance is an ability to maintain the line of gravity (vertical line from centre of mass) of a body within the base of support with minimal postural sway.

STATEMENT OF THE PROBLEM

The purpose of the present work was to study "effect of traditional training with and without ladder training on motor fitness variables of high school kho- kho players".

HYPOTHESES

It was hypothesized that there is a significant improvement on selected psychomotor variables (Balance, Reaction time) of high school kho-kho players due to the traditional training with and without ladder training.

METHODOLOGY

The investigator randomly selected sixty subjects from Govt. Hr. Sec. School, Ganapathi, Coimbatore, Tamil Nadu and T.N.G.R Hr. Sec. School, Varatharajapuram, Coimbatore, Tamil Nadu and divided three equal groups namely experimental group I, experimental group II and control group. The each group consisted of 20 subjects. Age limited between 12 to 17 years. The investigator selected Balance as dependent variables. Experimental group I (traditional training), experimental group II (traditional with ladder training) underwent respective training programme for the period of 12 weeks and control group not undergone any type of training. The data were collected by before and after training programmes. The balance tested with Stork stand test and scored as in time.

Table 1

Selection of the test

S. No	Components	Test Items	Units
1	Balance	Stork Stand Test	Seconds

Table 2

Computation of analysis of covariance among experimental groups and control group on balance

Test	Traditional training group	Traditional With Ladder Training Group	Control Group	Source of Variances	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test Mean	13.73	13.79	13.72	Between	0.06	2	0.03	0.07
SD	0.80	0.59	0.53	Within	24.29	57	0.43	
Post Test Mean	16.40	17.62	13.84	Between	149.23	2	74.62	71.68
SD	1.48	0.88	0.39	Within	59.34	57	1.04	
Adjusted Post Test Mean	16.39	17.64	13.83	Between	150.47	2	75.24	73.63
				Within	57.22	56	1.02	

* Significant at 0.05 level of confidence.

Required table value at 0.05 level of significance for 2 & 56 and 2 & 57 degree of freedom = 3.19

Table 2 shows that the pre-test mean value of experimental group I (Traditional training group), experimental group II (Traditional with ladder training group) and control group on balance are 13.73, 13.79, and 13.72 respectively. Standard deviation value of experimental group I, experimental group II and control group on balance are 0.80, 0.59, and 0.53 respectively. The obtained 'F' ratio for pre-test on balance is 0.07. It is lesser than the required table value of 3.19 for df 2 and 57 at 0.05 level of confidence on balance.

The post-test mean value on balance of experimental group I (Traditional training group), experimental group II (Traditional with ladder training group) and control group on balance are 16.40, 17.62 and 13.84 respectively. Standard deviation values of experimental group I, experimental group II and control group on balance are 1.48, 0.88 and 0.39 respectively. The obtained 'F' ratio for post-test on balance is 71.68. It is greater than the required table value of 3.19 for df 2 and 57 at 0.05 level of confidence on balance.

The adjusted post-test mean value on balance of experimental group I (Traditional training group),

experimental group II (Traditional with ladder training group) and control group are 16.39, 17.64 and 13.83 respectively. The obtained 'F' ratio for post-test on Balance is 73.63. It is greater than the required table value of 3.19 for df 2 and 57 at 0.05 level of confidence on balance.

The result of the study indicated that there is significant difference among the Traditional training group, Traditional with ladder training group and control group on Balance. Whenever, obtained 'F' ratio of adjusted post-test mean was found to be significant, the investigator applied the Scheffe's post hoc test to find out the paired mean differences and it was presented in table - III

Table 3

Scheffe's Post Hoc Test for the difference between Adjusted Post-test Mean on Balance

S. No.	Traditional Training Group	Traditional With Ladder Training Group	Control Group	Mean Difference	Confidence Interval
1	16.39	17.64	-	1.25	0.29
2	16.39	-	13.83	2.56	0.29
3	-	17.64	13.83	3.81	0.29

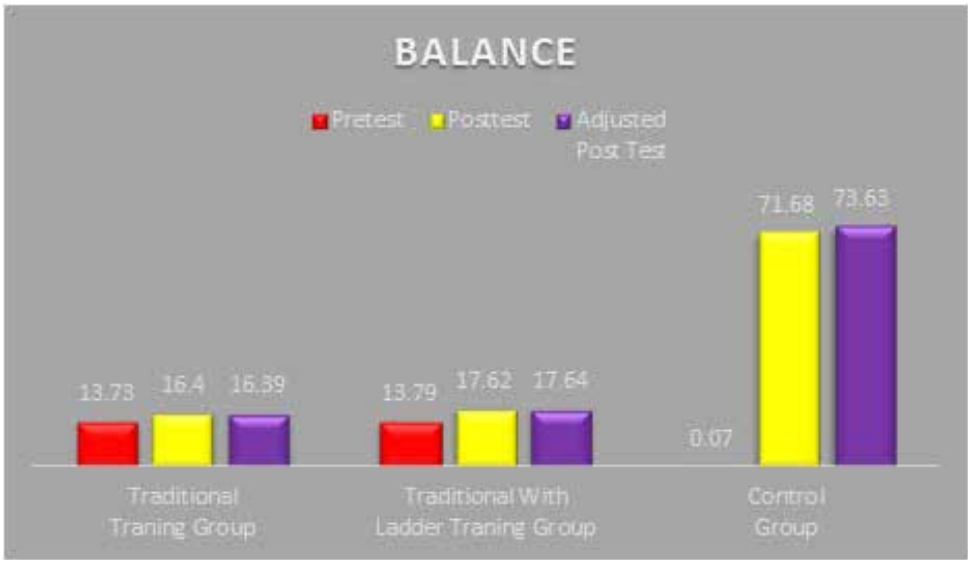
The Table 3 shows that the mean difference between, experimental group I (Traditional training group) and experimental group II (Traditional with ladder training group) is 1.25 on balance. It is lesser than the confidence interval value of 0.29, it is indicates that there is no significance difference between experimental group I and experimental group II on balance.

The mean difference value between, experimental group I (Traditional training group) and control group is 2.56 on balance. It is greater than the confidence interval value of 0.29, it is indicates that there is a significance difference between experimental group I and control group on balance.

The mean difference value between, experimental group II (Traditional with ladder training group) and control group is 3.81 on balance, it is greater than the confidence interval value of 0.29, it is indicates that there is significance difference between experimental group II and control group on balance.

The pre, post and adjusted post-test mean value of experimental group I (Traditional training group), experimental group II (Traditional with ladder training group) and control group on Balance were graphically represented in figure – I.

Figure I
Mean values on balance of traditional training group Traditional with ladder training group jump and Control Group



DISCUSSION ON FINDINGS

1. The results of this study revealed that the experimental group I (traditional training group), experimental group II (traditional with ladder training group) were significantly improved on balance.

2. It was conclude that the experimental group II (traditional with ladder training group) is better than the experimental group I (traditional training group) on balance.

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ISSN: 0973-6190

ATTITUDE OF COLLEGE TEACHERS TOWARDS FLIPPED CLASSROOM PRACTICES

4

V. LEKSHMI
Assistant Professor, N.S.S. Training College
P.B No – 3, Ottapalam, Palakkad, Kerala - 679101

INTRODUCTION

The ultimate aim of education is to prepare efficient citizens who can contribute to national development. Higher education programmes aim at providing in depth understanding of concerned subject and develop desirable attitudes and provide citizenship training. The 21st century learners expect more from a teacher along with content transaction. In this era of knowledge explosion, the role of teacher is changed a lot. In present scenario, the teachers cannot be mere knowledge providers. They have to do a lot to build up responsible enthusiastic young citizens. In the foremost, the teacher should be able to form learning objectives and learning activities for each of his or her learners according the learner's needs and capabilities. Teacher has to motivate learners for better achievements and should train them to acquire proper learning habits, the lessons of confidence, time management, the skills on inquiry, reasoning, creativity, interpersonal relation, meta-cognition, perceptual control etc. Teachers should be able to help the learners to understand themselves, their study habits, potentials etc. and make them more competent to adapt to the society. In this technologically advanced era, only a person with sound technological skills and cognitive skills can survive. In order to develop such a fittest learner community, teachers should be well equipped with technological skills. Our higher education programmes should incorporate methodologies which will equip our teachers to create technologically advanced young generation.

As use of ICT has grown to become ubiquitous within our own society, its impact on the learning experience has also developed to be of considerable interest to pedagogical researchers as well as those who approach the subject from a technical aspect as educational technologists. Current research into how learners experience learning with technology has attracted interest from influential groups outside academia. Alongside, the growth in personal technology use that is evidenced by the use of email and mobile phones the twenty first century has been characterized by a sharp growth in

the amount and the availability of information technology for staff and students.

Flipped Classroom is a form of Blended Learning in which learners learn content online but watching video lectures, usually at home and in class, learners apply knowledge by solving problems and doing practical work. Concept of flipped Classroom has emerged in response to the increasing need and demand to respond to diverse students' needs to provide, engaging and meaningful learning experiences. Compared to fully online learning, Flipped Classroom in the true sense is still new and emerging.

The concept of Flipped classroom is introduced by Bergmann& Sams in 2012. This new methodology emerges from the concepts of Individualised Instruction, Peer Instruction, Mastery Learning, Self - paced Learning etc. It makes use of the benefits of online learning and face to face interaction. Flipped Classrooms helps the learner to attain mastery over a subject or content according to his own pace and helps him to attain more practical skills through face to face sessions in the class room with the help of teachers and peer members.

NEED AND SIGNIFICANCE OF THE STUDY

The concept of higher education has undergone radical changes, but some of the pertinent problems related to higher education still continued to persist and the problems are related to traditional curriculum, ineffective method of teaching, less emphasis on development of professional attitude, least impact of school practices, poor academic background and feeling of professional insecurity and many such allied problems. A curriculum which caters the demands of present era has to be formulated and effective strategies has to be developed to inculcate confidence, professional attitude and for the development of knowledge scientifically. In this technological era of knowledge explosion it is necessary to develop a positive attitude towards modern practices like Flipped Classrooms. Only if a proper attitude is developed, we can practice it effectively. It is very necessary to know the level of attitude before adopting strategies. Hence the investigator prepared a tool to measure the Attitude of College Teachers towards Flipped Classroom Practices.

Objectives of the Study

1. To find out the Attitude of college teachers towards Flipped Classroom Practices.

2. To find out whether there exist any significant difference in the Attitude of college teachers towards Flipped Classroom Practices with respect to the sub samples based on gender, locale and stream.

Hypotheses

1. The College Teachers have a favourable attitude towards Flipped Classroom Practices.

2. There exists no significant difference in the Attitude of college teachers towards Flipped Classroom Practices with respect to the sub samples based on gender.

3. There exists no significant difference in the Attitude of college teachers towards Flipped Classroom Practices with respect to the sub samples based on locale.

4. There exists no significant difference in the Attitude of college teachers towards Flipped Classroom Practices with respect to the sub samples based on stream.

Methodology

The investigator adopted normative survey method for the present study. Attitude Scale on Flipped Classroom prepared by the investigator is administered among a sample of 250 College Teachers in Kerala. A five point Attitude Scale is prepared by the investigator which consists of 20 items. The reliability coefficient of the tool was 0.78. The following Statistical Techniques were adopted to test the hypothesis.

- Mean and Standard Deviation
- 't' test

Analysis and Interpretation

The following table (Table - 1) shows the result of statistical analysis for the whole sample.

Table 1

Sample Size	Mean	Standard Deviation
250	53.44	6.09

From Table 1 it is clear that, the college teachers have a favourable attitude towards Flipped Classroom Practices.

Table-2 shows the statistical analysis based on sub samples.

Table 2

Classificatory Variable		Sample Size	Mean	Standard Deviation	't' value	Significance at 0.01 level
Gender	Male	123	51.91	6.8	4.35	Significant
	Female	127	55.01	4.1		
Locale	Rural	129	54.3	6.54	1.37	Not Significant
	Urban	121	55.42	6.36		
Stream	Science	120	54.42	6.31	5.94	Significant
	Arts	130	49.63	6.43		

Table 2 reveals that the 't'-value for the sub sample based on gender is significant at 0.05 level. Hence it can be inferred that there is a significant difference between the attitudes of college teachers towards Flipped Classroom Practices with respect to gender. Female teachers shows more favourable attitude towards Flipped Classroom Practices than male teachers.

From Table – 2 it is also clear that the 't'-value for the sub sample based on locale is not significant at 0.05 level. Hence it can be inferred that there is no significant difference between the attitudes of college teachers towards Flipped Classroom Practices with respect to locale.

Table-2 also reveals that the 't'-value for the sub sample based on stream is significant at 0.05 level. Hence it can be inferred that there is significant difference between the attitudes of college teachers towards Flipped Classroom Practices with respect to their subject. College Teachers from science stream shows favourable attitude towards Flipped Classroom Practices than those from arts stream.

FINDINGS

- College Teachers have a favourable attitude towards Flipped Classroom Practices.
- There was significant difference between the attitudes of college teachers towards Flipped Classroom Practices with respect to gender.
- There was no significant difference between the attitudes of college teachers towards Flipped Classroom Practices with respect to locale.
- There is significant difference between the attitudes of college teachers towards Flipped Classroom Practices with respect to their stream of study.

CONCLUSION

It is critical that teacher should have content knowledge as well as attitude towards adopting modern strategies for effective transaction of subject. Teaching skills as well as favourable attitude towards modern practices has to be inculcated through training programmes. When traditional methods are only used, it is seen that critical components of effective teaching lags in the performance of many teachers. Flipped Classroom environment help the college teachers to master technological and teaching skills. It is the responsibility of the authorities to provide necessary learning support in providing access to Flipped Classroom environment so that the teachers in higher education sector will get self-regulatory authentic learning experiences. It is sure that through Flipped Classroom practices we can mould technologically empowered skilful learners for the 21st century.

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ISSN: 0973-6190

"A STUDY ON SELF MONITORING AND ACADEMIC ACHIEVEMENT AMONG IX STANDARD STUDENTS IN THIRUVALLUR DISTRICT"

5

T.C. GAYATHRI, M.Ed Student
S. SUTHAKAR, P. KARNAN and B. VENKATARATHANAM
Assistant Professor in Education
GRT College of Education, GRT Mahalakshmi Nagar,
Chennai- Tirupathi Highway, Thiruttani, Tamil Nadu - 631209

INTRODUCTION

Education not only creates a better human being but also contributes to the transformation of society. We are summoned to take forward our community, village, city, State, world. But to get that we need tools. The tools to improve the world are not fighting ideologies, or weapons as many have tried thorough history- but knowledge, sciences, arts. Those tools empower the people who sincerely want to see a more just world. Furthermore, the paradox that we find ourselves happy when we forget our own self and focus on the wellbeing of other is true. Working to improve the society through the tools education provides, helps us to develop our own capacities, and brings us peace and tranquility, although that is not the motive.

The ability of a student to self-monitor his or her performance is a natural step toward becoming independent, which can only happen when students take responsibility for their own behavior and essentially become "agents of change". Self-monitoring is defined as the practice of observing and recording one's own academic and social behaviors. Being able to self-monitor reflects a shift from reinforcement by others to self-reinforcement of appropriate behavior (Hanson, 1996). There are a number of systems of self-recording and self-monitoring procedures that stem from social skills and behavior management programs; however, self-monitoring can also be used effectively with academics. Furthermore, self-monitoring can be used both to assess where students are functioning academically and behaviorally and to improve academic or behavioral performance (Carr & Punzo, 1993; Rutherford, Quinn, & Mathur, 1996).

Self-monitoring is a strategy that can be used with students of all ages and disabilities, is relatively unobtrusive, appeals to students, and is inexpensive and relatively quick to implement (Carr & Punzo, 1993). Self-monitoring has been shown to be

effective in increasing more appropriate behaviors, increasing on-task behavior in the classroom, boosting completion of homework assignments, improving both academic performance and social skills, and reducing disruptive behaviors. In addition, self-monitoring actively engages the student as a participant in improving his or her behavior, there by increasing his or her investment in the process. Finally, self-monitoring techniques is an effective tool for generalizing and maintaining skills over time, because students can perform them any time and in any setting without needing an adult to help them. However, students first need to be taught how to self-monitor their academic and social behaviors.

Self-monitoring involves having a student keep track of his or her behavior. During research involving students monitoring their own behavior, it has been observed that subjects alter their behavior simply after consciously keeping track of it. One reason for such change is that self-monitoring helps decrease impulsivity by training the student to be aware of his or her behavior.

SELF MONITORING

Self-monitoring strategies are plans used to increase independence in academic, behavioral, self-help, and social areas.

ACADEMIC ACHIEVEMENT

By this, the investigator means the achievement of IX Standard students in quartile examination test score.

STATEMENT OF THE PROBLEM

Formally the problem can be stated as follows:

"A Study on Self monitoring and Academic Achievement among IX Standard students in Thiruvallur district".

OBJECTIVES OF THE STUDY

1. To find out significant difference among the IX Standard students with respect to Self Monitoring based on their Gender.

2. To find out significant difference among the IX Standard students with respect to Academic Achievement based on their Gender.

3. To find out significant difference among the IX Standard students with respect to Self Monitoring based on their Locality.

4. To find out significant difference among the IX Standard students with respect to Academic Achievement based on their Locality.

5. To find out significant difference among the IX Standard students with respect to Self Monitoring based on their Type of Management.

6. To find out significant difference among the IX Standard students with

respect to Academic Achievement based on their Type of Management.

7. To find out significant difference among the IX Standard students with respect to Self Monitoring based on their Type of Medium.

8. To find out significant difference among the IX Standard students with respect to Academic Achievement based on their Type of Medium.

9. To find out significant difference among the IX Standard students with respect to Self Monitoring based on their Type of Family.

10. To find out significant difference among the IX Standard students with respect to Academic Achievement based on their Type of Family.

11. To find out significant relationship between the Self Monitoring and Academic Achievement of IX Standard students.

12. To find out significant relationship between the Male and Female IX Standard students based on Self Monitoring.

13. To find out significant relationship between the Male and Female IX Standard students based on Academic Achievement

HYPOTHESES OF THE STUDY

1. There is no significant difference between the IX Standard students with respect to Self Monitoring based on their Gender.

2. There is no significant difference between the IX Standard students with respect to Academic Achievement based on their Gender.

3. There is no significant difference between the IX Standard students with respect to Self Monitoring based on their Locality.

4. There is no significant difference between the IX Standard students with respect to Academic Achievement based on their Locality.

5. There is no significant difference among the IX Standard students with respect to Self Monitoring based on their Type of Management.

6. There is no significant difference among the IX Standard students with respect to Academic Achievement based on their Type of Management.

7. There is no significant difference between the IX Standard students with respect to Self Monitoring based on their Type of Medium.

8. There is no significant difference between the IX Standard students with respect to Academic Achievement based on their Type of Medium.

9. There is no significant difference among the IX Standard students with respect to Self Monitoring based on their Type of Family.

10. There is no significant difference among the IX Standard students with respect to Academic Achievement based on their Type of Family.

11. There is no significant relationship between the Self Monitoring and Academic Achievement of IX Standard students.

12. There is no significant relationship between the Male and Female IX Standard students based on Self Monitoring.

13. There is no significant relationship between the Male and Female IX Standard students based on Academic Achievement

RESEARCH DESIGN METHODOLOGY

The study was through normative survey method of research and it is most suitable for the present study.

SAMPLE

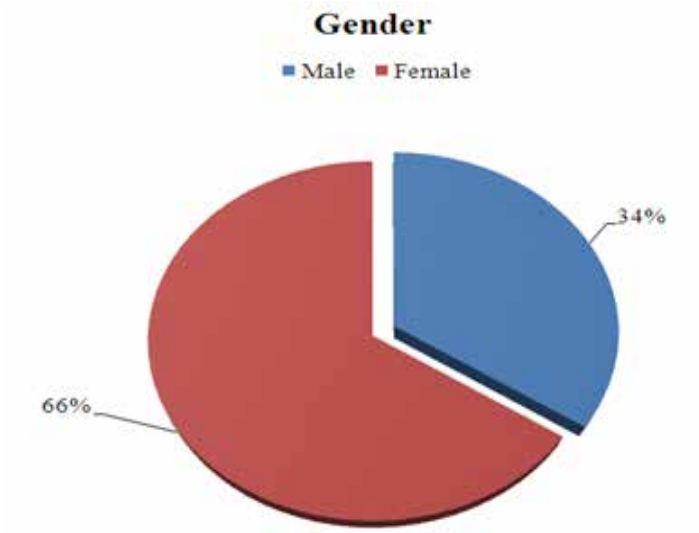
A stratified random sampling technique was adopted for the selections of Sample 300 IX standard students were taken for the present study.

Table 1

Table Showing Sample distribution

Variables	Categories	N	Percentage
Gender	Male	103	34.33
	Female	197	65.66
Location of the Residence	Rural	204	68.00
	Urban	96	32.00
Type of management	Government	103	34.33
	Aided	99	33.00
	Private	98	32.66

GRAPH SHOWING SAMPLING DISTRIBUTION BASED ON THEIR GENDER



RESEARCH TOOLS USED IN THE PRESENT STUDY

To verify the framed hypotheses the following tools and techniques were used in the present investigation

- ❖ Self Monitoring questionnaire developed by Dr. Ed Diener
- ❖ Quarterly Exam marks as Academic Achievement.

STATISTICAL TECHNIQUES

Suitable descriptive and inferential statistical techniques were used in the interpretation of the data to draw more meaningful pictures of results from the collected data. In the present study the following statistical techniques were used.

- ➢ Mean.
- ➢ Standard Deviation.
- ➢ Critical Ratio.
- ➢ Analysis Of Variance.
- ➢ Correlaton Coefficient.
- ➢ Quartile Deviation.

MAJOR FINDINGS

1. It is found that there exists a significant difference between Male and Female students among IX Standard students with regard to their Self Monitoring.

2. It is found that there exists no significant difference between Male and Female in Academic Achievement among IX Standard students.

3. It is found that there exists no significance difference between the urban and rural IX Standard students on their Self Monitoring mean scores.

4. It is found that there exists no significance difference between the urban and rural students on their Academic Achievement mean scores.

5. It is found that there exists a significant difference between Government vs. Aided and Aided vs. Private school students based on their Self Monitoring. And no significant is found among other Type of Management.

6. It is found that there exists no significant difference among the IX Standard students with respect to Academic Achievement based on their Type of Management.

7. It is found that there is a significance difference between the Tamil medium and English medium IX Standard students on their Self Monitoring.

8. It is found that there is a significance difference between the Tamil medium and English medium IX Standard students on their Academic Achievement.

9. It is found that there is a significant difference between Joint family and Nuclear family students among IX Standard students with regard to their Self Monitoring.

10. It is found that there is no significant difference between Joint family and Nuclear family students among IX Standard students with regard to their Academic Achievement.

11. It is found that there is a positive relationship between Self Monitoring and Academic Achievement.

12. It is found that there is a positive relationship between male and female IX Standard students with regard to their Self Monitoring.

13. It is found that there is a positive relationship between male and female IX Standard students with regard to their Academic Achievement.

Table 2

Table Shows the Significance of Difference Between the IX Standard Students With Respect to Self Monitoring Based on their Gender Using Mean Scores.

VARIABLE	GENDER	N	MEAN	SD	t - value	L.S
Self Monitoring	MALE	103	42.35	8.04	2.450	0.05
	FEMALE	197	44.77	8.15		

Graph Showing Significance of Difference Between the IX Standard Students With Respect to Self Monitoring Based on their Gender Using Mean Scores

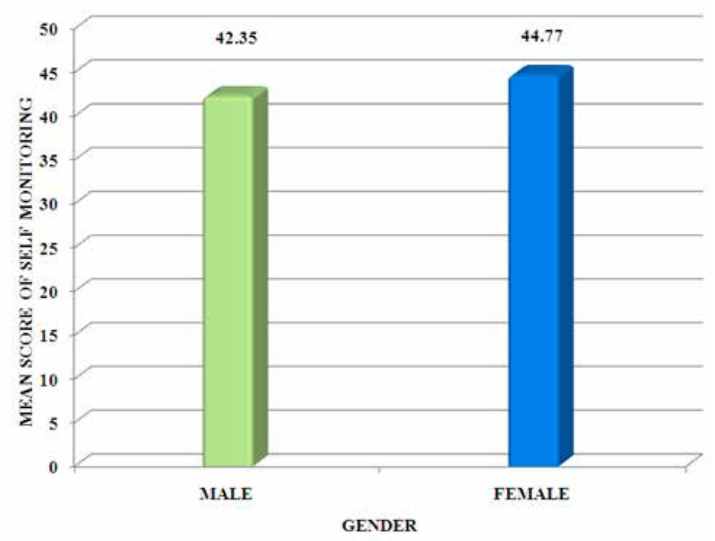


Table 3
Showing the Relationship between the Self Monitoring and Academic Achievement

Variable	Number	Correlation
Self Monitoring Vs Academic Achievement	300	0.627

Table 4
Showing the Relationship between the Male and Female IX Standard Students.

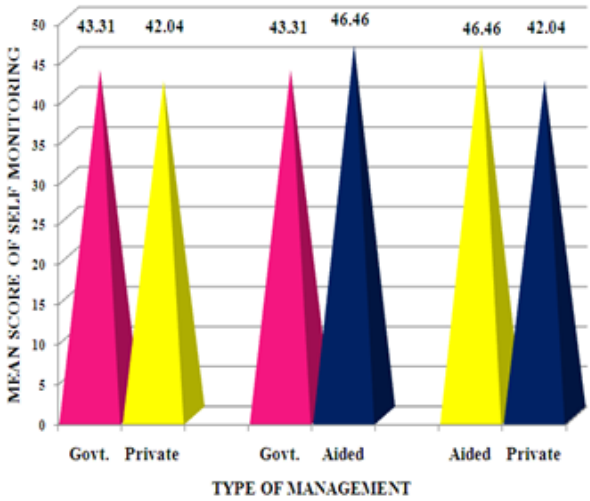
Variable	Number	Correlation
Male Vs Female	300	0.522

Table 5

Showing the significant difference among the IX Standard students with respect to Self Monitoring based on their Type of Management.

Variable	Type of Management	N	Mean	S.D.	t-value	L.S
Self Monitoring	Govt	103	43.31	7.81	1.106	NS
	Private	98	42.04	8.46		
	Govt	103	43.31	7.81	2.887	0.05
	Aided	99	46.46	7.70		
	Aided	99	46.46	7.70	3.839	0.01
	Private	98	42.04	8.46		

Graph Showing Significant Difference among the IX Standard Students With respect to Self Monitoring Based on their type of Management Using Mean Scores



EDUCATIONAL IMPLICATION

The analysis clearly shows that there exists high self monitoring level for the female IX Standard students than the male students. This happens due to difference prevailing among the gender in the present culture. Hence the teachers should guide the male students to monitor themselves proper planning hare by them. Individuals who high and low self-monitoring are guided by

different meta-controls of behavior in social contexts.

Self-monitoring will not only help them in the classroom, but also hopefully in real-life situations. They are becoming responsible for and accountable for their academic performance. By becoming responsible for their actions, students might be saved from developing learned helplessness. If students feel that they are not responsible for their own performance, they sometimes place the blame on others believing that the situation is out of their control, creating learned helplessness.

The results also show difference in the level of self monitoring among different management school students. It is mainly due to the climatic condition of the school campus and school environment. Hence the education department must look at this difference and can direct the school departments to improve their infrastructure and the level of students.

CONCLUSION

This study was successful in helping to analyze student achievement. The self-monitoring strategy is one that helps students focus on their achievement. During the data collecting period, it became apparent that the class average test scores either increased or stayed relatively the same. The literature that the investigator read to prepare for this research showed that students with special needs would benefit greatly from these strategies. The self-monitoring strategy provided a focus and purpose for the students. It created incentives by setting personal goals and rewards. Incentives play a key role in motivation whether they are intrinsic incentives or extrinsic incentives. Using reinforces to motivate change. Once the program is implemented and the child is aware of his or her target behavior, introduce reinforces for the positive behavior. This may help in motivating the child to improve that behavior. To be successful self-monitors, students need to learn to keep track of what they are doing and how they are thinking so they can adjust their behaviors and thoughts in order to meet goals or complete tasks. Hence, this study will help the current and future teachers and students in the education field and also helpful for the other investigators to upgrade this issue to find a fruitful solution for the problems surviving in the education field.

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ISSN: 0973-6190

CREATING LEARNING REVOLUTION THROUGH MULTIPLE INTELLIGENCES

6

Dr. P. THIRUSELVI
Assistant Professor
Michael Job Memorial College of Education for Women
Near Sulur Boat Lake, Ravathur Post, Sulur, Coimbatore - 641103

"Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid." - Albert Einstein

INTRODUCTION

The conventional outlook of intelligence is the way of how individuals perceive, comprehend, examine, analyze, react and respond to the external impulse. Intelligence can also be defined as "the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community" (Gardner, H., 1993). As stated by Linda Gottfredson, it is the ability to deal with cognitive complexity. As individuals differ from one another in their ability to understand, it becomes very crucial to espouse various methods to enable the individuals to comprehend and retain the information. Intelligence can also be defined as the ability to answer items on tests of intelligence. According to Dr. Howard Gardner, a developmental psychologist, the conventional concept of intelligence is too narrow and the score of IQ limits or restricts the potential of an individual into one single module, where he can display his intelligence in eight different areas. On this outlook, he developed the theory of Multiple Intelligences (MI).

Dr. Howard Gardner has identified and described eight different kinds of intelligence in his theory of Multiple Intelligences (MI). They are:

1. Linguistic Intelligence (using words and language)
2. Logical Intelligence (using numbers and reasoning skills)
3. Spatial Intelligence (thinking three dimensionally)
4. Kinesthetic Intelligence (manipulating objects and being physically adept)
5. Musical Intelligence (being sensitive to rhythm and sound)
6. Interpersonal Intelligence (understanding and cooperating with others)
7. Intrapersonal Intelligence (understanding oneself)
8. Naturalistic Intelligence (understanding patterns in nature, including animal and plant species, habitats, and human behaviors)

He has also proposed the possible addition of a ninth type which he refers to as "existential intelligence."

Gardner's theory has incredible impact in the field of education and it has acquired significant consideration and application. It provides educators with a conceptual framework for managing and reflecting on curriculum assessment and pedagogical practices. Eventually, many academicians developed new approaches to meet the needs of the diverse learners in their classrooms. It also validates the everyday experience of the academicians (Mindy L. Kornhaber).

Though it is a great contrast to traditional education systems, applying Multiple Intelligences in teaching and learning will undeniably direct to a constructive function of the education system. Teachers, therefore, should treat all intelligences equally important and teach to a broader range of talents and skills.

Though it is a very challenging one, incorporating Multiple Intelligences theory into classroom teaching becomes imperative as it provides opportunity for the students to specialize and excel in at least one area of intelligence. This article throws light on some strategies that are to be followed for different intelligences.

LINGUISTIC INTELLIGENCE

- Creative Writing - writing original pieces without boundaries.
- Formal Speaking - making verbal presentations to others.
- Humour/Jokes - creating puns and jokes on academic topics.
- Spontaneous Speaking - instantly speaking on a randomly drawn topic.
- Journal/Diary Keeping - tracing and keeping track of one's own thoughts and ideas.
- Poetry - creating one's own poetry and reading and appreciating others' poetry.
- Reading - studying written materials on a concept, idea, or process.
- Storytelling - making up and telling stories about any topic of a study matter.
- Verbal Debate - presenting both sides of an issue in a convincing manner.
- Vocabulary - learning new words and practicing using them accurately in regular communication

LOGICAL INTELLIGENCE

- Abstract Symbols/Formulas - designing meaningful summary notation systems for different processes or knowledge content.

- Calculation - using specified steps, operations, processes, formulas, and equations to solve a problem.
- Cognitive Organizers - working with logical thought maps such as webs, Venn diagrams etc.
- Logic Games - creating puzzles that challenge others to find a hidden rationale or pattern Number Sequences - investigating numerical facts and analyzing statistics on a topic.
- Problem Solving - listing appropriate procedures for problem-solving situations

SPATIAL INTELLIGENCE

- Active Imagination - finding connections between visual designs and prior experiences Color/ Texture Schemes - associating colors and textures with various concepts, ideas, or processes.
- Drawing - creating graphic representations of concepts, ideas, or processes.
- Guided Visualizing - creating mental pictures or images of a concept, idea, or process Mindmapping - creating visual webs of written information.
- Montage/Collage - designing a collection of pictures to show various aspects or dimensions of a concept, idea, or process.
- Painting - using paints or colored markers to express understanding of concepts, ideas, or processes.
- Patterns/Designs - creating abstract patterns and designs to represent the relationships between different concepts, ideas, or processes.
- Sculpting - creating clay models to demonstrate understanding of concepts, ideas, or processes.

KINESTHETIC INTELLIGENCE

- Physical Gestures - understanding of an idea in physical movement
- Tableau's - arranging a group of people to express an idea, concept, or process
- Drama - creating a drama that shows the vibrant relationships of various concepts and ideas
- Dance - choreographing a dance that demonstrates a concept or idea
- Physical Exercise - creating physical routines that others perform so that they may learn concepts, ideas, or processes
- Role Play - performing skits to show understanding of concepts or ideas
- Sports Games - creating a contest or game based on specific knowledge about a concept

MUSICAL INTELLIGENCE

- Environmental Sounds - using the natural sounds that are related to the object or concept.
- Instrumental Sounds - employing musical instruments to produce sounds and music for a lesson.
- Music Creation - composing and creating music to communicate

understanding of a concept, idea, or process.

- ❖ Music Performance - creating presentations or reports in which music and rhythm play a central role.
- ❖ Rhythmic Patterns - producing rhythms and beats to show the various aspects of a concept.
- ❖ Singing/Humming - creating songs about an academic topic or finding existing songs that complement a topic.
- ❖ Tonal Patterns - recognizing the tone dimension(s) of a topic.
- ❖ Vocal Sounds - producing sounds with one's vocal cords to illustrate a concept, idea, or process.

INTERPERSONAL INTELLIGENCE

- ❖ Collaborative Skills Teaching - recognizing and learning the social skills needed for effective person-to-person relationship.
- ❖ Cooperative Learning - using structured teamwork for academic learning.
- ❖ Empathy Practices - expressing understanding from life experience of other person.
- ❖ Giving Feedback - offering honest, sensitive input on one's performance.
- ❖ Group Projects - investigating a topic with others.

INTRAPERSONAL INTELLIGENCE

- ❖ Know Thyself Procedures--finding personal implications or applications of classroom learning for one's personal life.
- ❖ Metacognition Techniques - thinking about one's thinking.
- ❖ Emotional Processing - becoming aware of the affective dimensions of concepts.
- ❖ Concentration Skills - learning the ability to focus one's mind on a single idea or task.
- ❖ Higher-Order Reasoning - moving from memorizing facts to synthesizing and applying.
- ❖ Independent Studies/Projects - working alone to articulate feelings and thoughts on a topic.
- ❖ Silent Reflection Methods – working with reflection tools.

NATURALIST INTELLIGENCE

- ❖ Typical Pattern Recognition - discovering the repeating, standard patterns and designs of nature that manifest themselves.
- ❖ Caring for Plants/Animals - completing projects that involve caring for and training animals, insects and growing natural things.
- ❖ Conservation Practices - participating in projects that care for and preserve the natural environment.
- ❖ Environment Feedback - understanding and appreciating the

environment and tuning in to the natural feedback coming from the environment.

- ❖ Hands-On Labs - performing experiments or activities that use objects from the natural world.
- ❖ Nature Observation - participating in observation activities such as bird-watching and geological exploration.
- ❖ Sensory Stimulation Exercises – exposing the senses to nature's sounds, smells, tastes, touches, and sights.

EXISTENTIAL INTELLIGENCE

- ❖ Hands-On craft works – involving in craft lessons that incorporating various subjects like math, art, social studies, science so that the lesson becomes a personification of the bigger picture of education.
- ❖ Discussion – creating a discussion forum on a topic and expanding how the topic is related to real life situation.
- ❖ Participation – providing opportunity to be a part of multifaceted activities.
- ❖ Reading – generating interest to read books, articles, journals etc from other culture.

CONCLUSION

The real student centered education can be bestowed only when the interests and learning capacities of each individual are identified. Widening the ways to teach and learn by applying all the areas of intelligences, teachers can boost up the prospects for creating new opportunities for academic brilliance. It is a duty of a teacher to establish trendy tools to accommodate diverse learners in their field of intelligence. Teachers must weave a social fabric in which each diverse human gift will discover a fitting place. Such new definitions of intelligence will nurture recognition and enhance the appraisal of individual's capabilities and indeed will create a learning revolution.

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