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CONTENTS

EDITORIAL

The first and foremost purpose of education is to educate all citizens and give everyone equal opportunity as a means to succeed in life. Education is a way of igniting and enlightening the thought of an individual. It is a magical tool to grasp and get the insight of the infinity. It should help learners to differentiate between knowledge and ignorance, light and dark, day and night, space and time, life and death, image and mirage, finite and infinite etc. The combinations of knowledge and skills as well as the common values help young ones bloom into adults and become responsible and productive citizens of the nation.

The central issues of curriculum usually do not attract our attention. It is because they have already been decided by external agencies and our job is simply to follow in their footsteps to achieve their level of progress. In order to develop a curriculum suited to our culture, more and more researches should be undertaken in fundamental subjects. Research based education lays the foundation for a knowledge society, which is a prerequisite for the proper development of the nation.

The present issue of Avila Journal of Educational Research has ten articles. The first article is on developing innovative attitude through reflective thinking strategy of teaching. The second one attempts to highlight the significance of computer based instructional package for enhancing achievement in physics. The next paper deals with the achievement in social science and acquisition of social values using dialogue method. The next article focuses on autodidacticism and professional development of teachers. The next one throws light on the effectiveness of Vedic sutras on the achievement in mathematics among secondary school students. The next article discusses the importance of STAD strategy in enhancing the achievement in accountancy at the higher secondary level. The next paper makes a glimpse to Padmasree Sugathakumari's poems with a view to highlight the elements of women empowerment. The next paper deals with social maturity and teaching attitude of student teachers in Kerala. Effectiveness of 7E instructional model on the achievement in physics is the theme of next article. The last paper attempts to throw light on the yoga practice and mental health among higher secondary school students.

Through this journal our sincere attempt is to publish research papers on the most relevant issues in different spheres of education. Let me thank all those who have contributed immensely for the success of this journal. We are looking for the constant support, cooperation, and feedback of our beloved readers.

CHIEF EDITOR

DEVELOPING INNOVATIVE ATTITUDE THROUGH REFLECTIVE THINKING STRATEGY OF TEACHING

Sibu G. Netto

Abstract

Innovation is quite often viewed as the application of talents for better solutions that meet new requirements, unarticulated needs, or existing needs. Innovations are results of thought processes of individuals towards various problems, incidents, phenomenon which come across in life. Reflective thinking is nothing but thought processes; and these thought processes often lead one to innovations. In this sense, an approach to trump hurdles with valour can be termed innovative attitude. The study under discussion is an experiment conducted with a sample of 212 Standard VIII students, drawn from three English medium schools in Kerala. A test on innovative attitude prepared and standardised by Sanghi (2002) was administered by the investigator to assess the innovative attitude of the students. The study concludes that innovative attitude among secondary school students can be developed better through 'reflective thinking strategy of teaching' than 'conventional method of direct instruction.'

Introduction

The field of innovation is very broad. The ability to develop new ideas and innovations has become a priority for many organizations. Innovations are often results of reactions of the intellect towards overcoming pitfalls, improving on the existing or even seeking a bit of novelty. Innovation can be defined as a process that provides added value and a degree of novelty to the ways of support or backing either by way of knowledge creation or diffusion of existing knowledge. Innovation is also viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs.

An attitude is a relatively stable organisation of beliefs, feelings and behaviour tendencies directed towards something or someone – the attitude object (Morris & Maisto, 2001). Innovative attitude surfaces when individuals confront with failures and try to learn from failures; a learned (not inherited), stable (not volatile) and relatively enduring (not transitory) evaluation (positive or negative judgement) of a person, object or idea that can affect his/her behaviour. It can thus be seen as the ability of individuals to discover new relationships or see things from new perspectives to form new combinations from existing concepts.

Today education is considered to be the leading force for generation of knowledge. The ability of educational institutions to put forward ideas of higher

values can be a source of competitive advantage and represents the reason for which learners may opt for one institution to the disadvantage of another. The institutions that can create competitive advantage are able to improve their activities by the gained experience and acquired knowledge and over time become the sources of their distinctive competences. Intense global competition and technological development have made innovation a source of competitive advantage. Learners are also expected to devise their own ways and means for knowledge construction; Innovative Attitude is an index of the learners' potential to involve and contribute to the construction of knowledge on their own. To quantify the innovative attitude of students, a test on innovative attitude prepared and standardised by Sanghi (2002) was adopted for the present study. The test consists of 10 items to assess one's receptivity to innovation. Definitions of innovation like 'new ideas that work', 'novelty in action' state that in general innovation is not only the idea but also a new practice. According to Schumpeter (1934) innovation takes place when either a new element or a new combination of old elements is introduced (cited in Shavinina, 2003). This study details a pioneering experiment on how 'reflective thinking strategy of teaching' improves 'innovative attitude' among secondary school students.

Methodology

The investigator in order to realise the objectives of the study makes use of experimental method with non-equivalent pre test - post test design. In order to get an adequate sample, the present study makes use of six intact classroom groups; one experimental and one control group each from three schools by random procedures. A sample of 212 English medium students of Standard VIII got selected for the study. Teaching method is the independent variable and innovative attitude is considered as the dependent variable for the study. The tools used were an 'achievement test' prepared and standardised by the investigator based on the topics 'solutions' and 'acids and bases' in the standard VIII Chemistry textbook of Kerala and the 'test on innovative attitude' prepared and standardised by Sanghi (2002). The test on innovative attitude consists of ten statements. The respondents have to indicate their agreement towards each of the statements by giving response in a five point scale. Scores 5, 4, 3, 2, and 1 are given to the responses – always, often, do not know, seldom and never. The total score for the test on innovative attitude is obtained by adding the scores for all the statements. Thus, a respondent can obtain a maximum score of 50 and a

minimum score of 10. The total score obtained for the ten statements indicate ones degree of innovative attitude.

Objective of the Study

The aim of the study is to establish that innovative attitude can be developed through reflective thinking strategy of teaching. This aim was achieved by addressing the objective:

To verify whether reflective thinking strategy of teaching is effective in improving the level of innovative attitude among secondary school students.

Analysis of Data

The investigator compared the scores obtained for the test on innovative attitude before the experiment, after the experiment and the gain in performance of the pupils in the experimental group and control group by testing the significance of the difference between the means of the pre test, post test and gain scores of the two groups. The data and results of significance are given in tables 1 to 3.

Before Experiment

The investigator administered the test on innovative attitude to students of both experimental and control groups in order to measure their innovative attitude before the experimental treatment. The data and result of test of significance of the difference in mean scores of test on innovative attitude are shown in table 1.

Table 1

Data and Results of Test of Significance of the Difference between the Mean Pre Test Scores of Experimental and Control Group regarding Innovative Attitude

Group	No. of Pupils	Mean	Standard Deviation	Critical Ratio	Level of Significance
Experimental	106	35.23	5.89	1.41	P > .05
Control	106	36.27	4.82		

From the table 1 it is seen that the mean innovative attitude scores for experimental and control groups are 35.23 and 4.82 with standard deviation 5.89

and 4.82 respectively. The obtained value of critical ratio (CR = 1.41; p > .05) is not significant even at .05 level. This indicates that there is no significant difference between the means of the pre-test scores of pupils in experimental and control groups. Since the mean of the pre-test score of experimental group and control group, it can be assumed that the two groups are almost equal on their innovative attitude before the experiment.

After Experiment

During the study the experimental group was taught through reflective thinking strategy of teaching and the control group was taught through conventional method of direct instruction. After the treatments, the investigator administered the test on innovative attitude to both groups and the scores were collected employing the same tool used for the pre-test to measure the innovative attitude. The data and result of test of significance of the mean scores of the test on innovative attitude after the experiment are presented in table 2.

Table 2

Data and Results of Test of Significance of the Difference between the Mean Post Test Scores of Experimental and Control Group regarding Innovative Attitude

Group	No. of Pupils	Mean	Standard Deviation	Critical Ratio	Level of Significance
Experimental	106	37.94	5.41	2.19	P < .05
Control	106	36.34	5.20		

From table 2 it is seen that the mean innovative attitude scores for experimental and control groups are 37.94 and 36.34 with standard deviations 5.41 and 5.20 respectively. The obtained value of critical ratio (CR=2.19; p<.05) is significant at .05 level. This means that there is significant difference between the means of the post test scores of pupils in experimental and control groups. Since the mean of the post test scores of experimental group is greater than that of control group, it can be interpreted that reflective thinking strategy of teaching is superior to conventional method of direct instruction in developing the innovative attitude among secondary school students.

Gain in innovative attitude scores

To further establish the effectiveness of reflective thinking strategy of teaching, in developing the innovative attitude, the innovative attitude scores of pupils in experimental group was compared with that of pupils in the control group by testing the significance of the difference between the mean gain scores of the two groups. The data and results of the test of significance are given in table 3.

Table 3
Data and Results of Test of Significance of the Difference between the Mean Gain Scores of Experimental and Control Group regarding Innovative Attitude

Group	No. of Pupils	Mean	Standard Deviation	Critical Ratio	Level of Significance
Experimental	106	5.25	2.72	3.80	P < .01
Control	106	4.91	0.07		

The table 3 shows that the obtained value of critical ratio (3.80) is significant at .01 level. Therefore, it can be inferred that there is significant difference between the mean gain scores of pupils in experimental and control groups. Since the mean gain scores of experimental group is greater than that of control group, it can be interpreted that the reflective thinking strategy of teaching is superior to conventional method of direct instruction in developing innovative attitude among secondary school students.

Genuineness of the difference in performance of experimental group and control group based on scores of innovative attitude

Here the investigator compares the effectiveness of reflective thinking strategy of teaching over conventional method on the variable innovative attitude. The scores of test on innovative attitude of 212 students were subjected to the statistical technique of ANCOVA to determine the effectiveness of the former method over the latter. The details are presented in tables 4 to 6.

Table 4
Summary of Analysis of Variance of 'X' (Pre test) and 'Y' (Post test) Scores of Pupils in Experimental and Control Groups

Source of Variation	Df	SS_x	SS_y	$MS_x (V_x)$	$MS_y (V_y)$
Among means	1	58.12	136.3	58.12	136.32
Within groups	210	6073.63	5911.4	28.92	28.15
Total	211	6131.75	6047.8	-	-
F_x				2.01	
F_y					4.84

The F ratios for the two sets of scores were tested for significance. The table values of F for df 1/105 are 3.94 at .05 level and 6.90 at .01 level. The obtained value of Fx is 2.01 which is not significant at .05 level; hence there was no significant difference between pre-test scores of experimental and control group. The obtained Fy value 4.84 is significant at .05 level indicating that the two groups differ significantly in the post-test achievement. The total sum of squares and adjusted mean squares variances for post-test scores were computed and F-ratio was calculated. The details are presented in the table 5.

Table 5
Summary of Analysis of Co-Variance of 'X' (Pre test) and 'Y' (Post test) Scores of Pupils in Experimental and Control Group

Source of Variation	Df	SS_x	SS_y	SS_{xy}	SS_{yx}	MS_{yx}	S_{yx}	F_{yx}
Among Means	1	58.12	136.3	-89.01	247.18	247.18	4.45	12.49
Within Groups	209	6073.63	5911.4	3283.51	4136.31	19.79		
Total	210	6131.75	6047.8	3194.5	4383.49	-		

The obtained value of F ratio 12.49 is significant at .01 level, as the table value is 6.76 at .01 level. This significant F ratio for the adjusted post-test scores shows that the two final scores viz the final mean score of pupils in experimental group and that of the control group differ significantly after they have been adjusted for difference in the pre-test scores. To find out which of the two methods is more significant, the investigator applied t-test.

Comparison of Adjusted Mean Scores

The adjusted mean for the post-test scores of the students in the experimental and control groups were computed. The data is given in the table 6.

Table 6
Data for Adjusted 'Y' Means of the Post-Test Scores of Pupils in Experimental and Control Group

Groups	N	M_x	M_y	M_{yx}
Experiment	106	35.23	37.9	38.23
Control	106	36.27	36.3	36.06
General Mean	212	35.75	37.14	-

Adjusted means for post-test scores were tested for significance for df 1/211. The t value obtained was 3.55. The t value obtained 3.55 exceeds the critical value of t (df, 1/211) 2.60 at 0.01 level. The significant t value leads to the conclusion that the two means differ considerably. This implies that the experimental group and the control group differ significantly in their innovative attitude. The adjusted mean of post-test scores for the experimental group is greater than that of the control group. Therefore, it is obvious that the experiment group is better than the control group in terms of innovative attitude.

Conclusion

The finding of the study makes it coherently clear that the students who learned through reflective thinking strategy of teaching have bettered their innovative attitude than those who studied through the conventional method of direct instruction. In view of the aforesaid findings it is recommended that reflective thinking strategies of teaching has to be considered with ample

importance in our classroom transactions and has to be infused on activities, processes and procedures that are carried out in the pre-active, interactive and post-active stages of the teaching-learning proceedings.

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COMPUTER BASED INSTRUCTIONAL PACKAGE FOR ENHANCING ACHIEVEMENT IN PHYSICS AT HIGHER SECONDARY LEVEL

Binuraj A.

Abstract

Today educators and psychologists have highlighted the necessity to follow educational methods that can benefit the learner the most. Each individual has his own needs, interests, capacities and requirements. To meet the different learner characteristics, individualized instruction is an effective learning strategy. The major objective of the present study was to find out the effectiveness of a Computer Based Instructional Package in enhancing the achievement in physics among higher secondary school students. The study was conducted in the pre-test post-test, non-equivalent group design, where there was one experimental group and one control group. The sample for the study consisted of 120 students from two divisions of Standard XII of TRK Higher Secondary School, Vaniyamkulam, Palakkad district. The performances of the two groups were compared by using the technique of analysis of covariance. The findings of the study establishes superiority of the Computer Based Instructional Package in enhancing the achievement in physics among higher secondary school students when compared to present activity oriented methods.

Introduction

Nowadays most of the educational views revolve around the concept that child can construct knowledge from his own experience. The two views of education viz. the information transmission view and the constructivist view have been at war for centuries. The information transmission view holds that teachers should be masters of particular domains of knowledge and their job is to transmit their expertise about these domains to students through lectures and recitations (Hussain, 2010). This view is teacher centered in nature. Constructivism is the last decade's dominant theory that has roots in philosophy, psychology, and cybernetics and attempts to describe how people know the world (Sarvey & Diffy, 1996). Constructivist approach stresses communication and collaboration of students with their peers as well as with the teacher. It holds the view that teachers should be facilitators who help students to construct their own understanding and capabilities on carrying out challenging tasks. This view puts the emphasis on the activity of the student rather than of the teacher. Teachers are supposed to develop or provide different teaching materials and strategies for

different learners based upon the concept of individualized teaching according to the student's ability. If the teaching method can meet a learner's specific learning style, then it will facilitate his achievement.

Constructivist learning is based on student's active participation where they are "constructing" their own knowledge by testing ideas and approaches based on their prior knowledge and experience, applying these to new situations and integrating the new knowledge gained with pre-existing intellectual constructs (Richardson, 1997). Recent interpretation of constructivism suggests that each learner constructs his schemata, bits of knowledge, explanations or pictures of reality according to the learner's individual goals, previously existing concepts and new perceptions. Learning from that perspective is much more under the control of the learner. A paradigm shift from teacher-centered instruction to learner-centered instruction is needed to enable students acquire the knowledge and skills sufficient to make them fit in the present era (Sarvey & Diffy, 1996). Educators are always concerned about what educational methods can benefit the learner the most. Nowadays most of the educational views revolve around the concept that child can construct knowledge from his own experience. Each individual has his own needs, interests, capacities and requirements. To meet the different learner characteristics, individualized instruction is an effective learning strategy. The goal of individualized instruction is to make the learning self-initiated and self-directed. Educators and psychologists have highlighted the necessity to take into account the learner's individual differences and learning styles because they represent the foundation upon which instructors should build their instructional methods.

Earlier, in our state, importance was given to the product aspect of science, while the process aspect was neglected. This comes out very clearly when we analyze the methods of teaching adopted earlier and those proposed by SCERT as part of new curriculum. Earlier science teachers used mainly the lecture method and lecture demonstration method in order to impart large quantity of product aspect of science to the pupils but these methods are not good enough in developing the process aspect of science among the pupils. But now, in our revised science curriculum, we give importance to both the knowledge (the product aspect of science) and the ways by which the knowledge is acquired (the process aspect of science). On account of this the methods of teaching have to be

changed. Now we are expected to use modern instructional strategies giving importance to the process aspect of science.

The higher secondary education is a unique investment in the present and future being the ultimate guarantee of national self-reliance. The critical purpose of higher secondary education is to prepare the students for their future professional lives. Meeting this purpose requires supporting the students in developing deep understanding of their discipline. To meet the higher secondary education goals of developing students, professional expertise teaching should be done in a manner consistent with finding an expert performance in domains that are relevant. Today's higher secondary level education follows activity oriented method of instruction. even though the actual spirit of activity oriented method of instruction is to make the learner independent, the different strategies adopted in this method of instruction is limited only to the cognitive level development. There is no option of revising the discussion other than referring to notes made during the session or retrieve it from memory. It is seen that in many higher secondary schools, even though the method proposed is activity oriented method, many teachers still prefer to teach either by lecture method or by demonstration method. Teachers may list out a series of drawbacks of the activity method – time consuming, lack of content coverage, expensive, etc. as the reasons for not using this method in their classes. Also, it is often observed that some pupils do not show adequate interest in 'doing' the activities while teachers transact using activity oriented methods.

Significance of the Study

One of the most powerful reasons for considering the use of computer technology in an educational system is that they put learning in the hands of the learner. Computer Assisted Instruction can help the student to see the unseen, to list the theoretical concepts, to comprehend abstract ideas, to communicate more effectively reducing the teacher- student ratio and helps to take more informal decisions (Chiniwar, 2013). It facilitates individualizing curriculum, permits learners to dictate the pace of learning and widen the source of information. Computer technology also promotes active learning and allows for interaction between and among peers and mentors, there by the students can construct knowledge. Each student gets the chance to absorb knowledge to his capacity. 'Learning by doing' has been considered as one of the best methods of learning. When used appropriately computers enable new ways of teaching and learning

rather than simply allow teachers and students to do what they have done before. If designed and implemented properly computer-supported education can promote the acquisition of knowledge and skills that will empower students for life-long learning.

Computer is a powerful tool in the learning environment and a wide variety of techniques of using computer in education have emerged over a period of time and are now become very common in use. Even though a number of computer based learning materials are available in various subjects, most of them are not according to the context and culture of our system of education. Moreover self learning materials for teaching physics at higher secondary level are scanty. The packages already available are mostly not following constructive approach to teaching physics and they contain only provision for simulation and drill and practice. The computers have a vast potential for instruction in all educational environment ranging from schools to universities. As computer is now being used in all sectors of life, in a society where most of the work is becoming computer based, education, teaching and learning can't resist their use for a longer period to cope with the world. The Investigator's own experience with use of computers in classrooms and the gaps existing in the review conducted in this area motivated the Investigator to undertake a study of this kind to develop an interesting, innovative and interactive Computer Based Instructional Package in physics at the higher secondary level by following the principles of education like individualized instruction, constructivism and learning by doing.

Objectives of the Study

1. To study the achievement in physics of higher secondary school students taught through a Computer Based Instructional Package and that of students taught through activity oriented method of instruction
2. To compare the effectiveness of the Computer Based Instructional Package with that of the activity oriented method of instruction in enhancing the achievement in physics at higher secondary level.

Hypothesis of the Study

1. The achievement in physics of higher secondary school students taught through Computer Based Instructional Package is significantly higher than that of students taught through activity oriented method of instruction.

Methodology in Brief

The major objective of the present study was to find out the effectiveness of a Computer Based Instructional Package in enhancing the achievement in physics among higher secondary school students. The investigator prepared a Computer Based Instructional Package in physics based on the unit 'ray optics and optical instruments' from the standard XII Physics text book. The study was conducted in the pre test-post test, non-equivalent groups design, where there was one experimental group and one control group. The sample for the study consisted of 120 students from two divisions of Standard XII of TRK Higher Secondary School, Vaniyamkulam, Palakkad district. One division comprising of 60 students was taken as experimental group and the other having the same number of students as the control group. The experimental group was taught through the Computer Based Instructional Package and the control group through existing activity oriented method of instruction. An achievement test was administered to each group before and after the experimentation. The performances of the two groups were compared by using the technique of analysis of covariance.

Analysis and Discussion

1. Achievement in physics of experimental group and control group

The pre test and post test scores obtained by the experimental group and control groups were condensed into frequency tables and the arithmetic mean, median, mode, standard deviation, skewness and kurtosis were calculated in order to get a general picture. The values of various descriptive statistics calculated are given in table 1.

Table 1
Differential Statistics Calculated for the Pre Test and Post Test Scores of Experimental Group and Control Group

Group	Test	Mean	Median	Mode	SD	Skewness	Kurtosis
Experimental	Pre	185.00	183.00	179.00	26.53	0.976	1.365
	Post	198.08	193.50	184.34	25.128	0.660	0.929
Control	Pre	179.37	177.50	173.76	17.854	0.470	-0.075
	Post	184.55	185.00	185.90	22.036	0.949	1.848

For the pre test, the calculated values of the three most commonly used measures of central tendency namely mean, median, and mode for the experimental group are 185.00, 183.00 and 179.00 respectively and that for the control group are 179.37, 177.50, and 173.76 respectively. These values show that the two groups did not differ very much in their scores in pre test. The values of mean, median, and mode of the post test scores of the experimental group are 198.08, 193.50 and 184.34 respectively and that of the control group are 184.55, 185.00, and185.90 respectively. The gain in performance of both the groups in terms of measures of central tendency is shown in table 2.

Table 2
Gain Scores of the Experimental Group and Control Group in Terms of Measures of Central Tendency

Group	Mean	Median	Mode
Experimental Gain	13.08	14.00	15.84
Control Gain	5.18	4.50	3.14

The values of mean, median and mode of the experimental gain score are 13.08, 14.00 and 15.84 and that of the control gain score are 5.18, 4.50 and 3.14 respectively. The analysis clearly indicates that the gain in achievement of the experimental group is high compared to control group.

2. Comparison of the effectiveness of the Computer Based Instructional Package with that of the activity oriented method of instruction in enhancing the achievement in physics

After the experiment, the achievement of the students in the experimental group and control group were compared by testing the significance of difference between the means of the post test scores of the two groups. The data and the results of test of significance are given in table 3.

Table 3
Data and Results of Test of Significance of the Difference between the Mean Post test scores of Experimental Group and Control Group

Group	Mean	S.D	N	Critical Ratio	Level of Significance
Experimental	198.08	25.128	60	3.14	$p < .01$
Control	184.55	22.036	60		

The obtained value of critical ratio is significant (CR = 3.14, $p < .01$) showing that there is significant difference between the means of the post test scores of the students in experimental and control groups. Since the mean of the post test scores of the experimental group is significantly greater than that of the control group, the students in the experimental group is superior to the students in the control group in their academic achievement.

Since the sample selected for the present study were non equivalent intact classroom groups, the higher post test scores of the students in the experimental group than that of the control group cannot be solely attributed to the application of the experimental treatment alone. In this context, the data were subjected to Analysis of Covariance (ANCOVA). The details are presented in table 4 and table 5.

Table 4
Summary of One Way ANCOVA of Achievement Scores by Taking Pre-Achievement as Covariate

Source of Variance	df	$(SS_{y.x})$	$(MSS_{y.x})$	$F_{y.x}$	Level of Significance
Treatment	1	4233.72	4233.72	8.08	$p < .01$
Error	117	61272.00	523.69		
Total	119	65505.72			

Table 5
Summary of Adjusted Mean Scores of Achievement by Taking Pre-Achievement as Covariate

Group	Adjusted Mean Scores of Achievement	Standard Error	Critical Ratio	Level of Significance
Experimental Group	197.30	2.966	4.04	$p < .01$
Control Group	185.33	2.966		

From Table 4, it can be seen that the adjusted F-Value ($MSS_{y.x}$ of Treatment/error) is 8.08 (table value is 6.86) which is significant at .01 level with df= 1/117. It shows that the adjusted mean scores of achievement of experimental group and control group differ significantly. Further from the Table 5 it is seen that the adjusted mean scores of achievement of experimental group (197.30) is significantly greater than that of the control group whose adjusted mean score is 185.33. (CR = 4.04; $p < .01$). It may, therefore, be said that the Computer Based Instructional Package (CBIP) could significantly enhance the achievement of the students in comparison to activity oriented method of instruction when pre-achievement was considered as covariate.

Several studies were conducted to find out the effectiveness of Computer Based Instruction. But only a few among them were interactive, emphasizing the importance of including text, sound, diagram, pictures, animations, etc. as conducted by Brian (1991), Aldamesh (1995), Arulsamy and Sivakumar (2004), Kablan and Erden (2008), Johnson and Rubin (2011), and Maheswari (2012). Most of the studies were used for testing the effectiveness in the development of the conceptual understanding of the learner and proved that computer based instruction is effective for enhancing the achievement of the learner; which is in agreement with the findings of the present study.

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ACHIEVEMENT IN SOCIAL SCIENCE AND ACQUISITION OF SOCIAL VALUES USING DIALOGUE METHOD: A COMPARATIVE STUDY AMONG SECONDARY SCHOOL STUDENTS

Benny Varghese and Rosemary C. T.

Abstract

Today one sees everywhere grossness and general insensitivity to finer feelings with the sole object of life being to make oneself as comfortable materially as one can. Sensitivity to sufferings of fellow human being is lacking in most of us and it is very rare to see people with social concern. Our physical environment t- rivers, mountains, forests, plants and animal life is getting increasingly polluted and depleted of its resources. This is the reason why many researches are going on in the field of Value education. The use of dialogue method in social value development also can be used in Schools at elementary level in order to inculcate in them, the importance of value in their life. For the present study experimental method was employed. The result revealed that the dialogue method is equally effective for secondary school girls and secondary school boys in enhancing their achievement in social science. But the girls are more advantageous when compared to boys in acquiring social values through the dialogue method of teaching.

Background of the Study

Education aims at the development of all the capacities in the individual which will enable him to control his environment and fulfill his facilities. It is believed that education should be such that it may give an opportunity to the child to face various problems of actual life. Meaningful education serves as a potent instrument for self development and consequently paves the way for the development of the society. The development of the individual and the progress of the nation depend mainly up on the education system of the country. Man has the distinctive capacity to be aware and understand himself. Besides, he has the unique position of living in a formal Society. Both these facts raise questions of attaining degree of inner harmony and competence in interpersonal relations. These questions relate to man's physical adjustments. However, personal adjustment and academic achievements are interrelated. Quality education is inseparable from value oriented education. The values present a true perspective of the development of any society. They tell us to what extent a society has

developed itself. Values are virtues, ideals and qualities on which actions and beliefs are based. Education should make students more humane and virtuous. It should aim at developing moral, social and spiritual values.

Education is the vehicle of knowledge, self preservation and success. Education not only gives us a platform to succeed, but also the knowledge of social conduct, strength, character and self respect. The greatest gift education gives us is the knowledge of unconditional love and a set of values. The rapid changes in every sphere as a result of technological advancement and unbridled liberalization adversely impact on the young mind. Education without values is not beneficial to anyone. Education devoid of values may be detrimental to society in the long run. Values bring quality and meaning to life and give a person his identity and character. Children imbibe values all the time from their parents, teachers and peers. But it is also necessary that we deliberately teach them the right values right from their childhood. There is need to show students the moral path to direct them from evils like cyber crime and consumerism and instil responsibility and respect.

The Kothari commission has pointed out the vital need for inculcation of values in education. The explosion of scientific knowledge should combine itself with a deep sense of social responsibility and spiritual values in the building up of one's personal and national character. Inculcation of proper social moral and spiritual values in the pupil is essential to meet the challenges of the modern age of science and technology.

Education is a process of initiating the learner to good life. But today in education primary importance is given to transmission of knowledge and cultivation of occupational skills. Hence the present day system of education seems to be a "moral vacuum". As Gandhi pointed out, education without character leads to criminality; educated persons have wider opportunities to indulge in crimes and that too committing them most efficiently and technically.

Social science is precisely the method of exploring sometimes the behavior of an individual, otherwise the behavior of a system, society or culture. The social science addresses many of the questions that concern the humanities. The social science comprises the scientific study of the human aspects of the world. Dialogue method teaching (Barbules, 1993) recommends the interaction of at least two district spectrums to characterize different forms of dialogue. The

degree to which an interchange is critical or inclusive and the degree to which the investigator is intended to converge.

Dialogue is a way of observing collectively how hidden values and intentions can clash without our realizing. It can therefore be seen as an arena in which collective learning takes place and fellowship and creativity can arise. It creates an opportunity for each participant to examine the preconceptions, prejudices and the characteristic patterns that lie behind his/her thoughts, opinion, beliefs and feelings, along with the roles he/she tends habitually to play. Dialogue method helps the groups to come to know each other and they try to be open towards other religions. Classrooms and schools should provide proper environment for our children to develop some of the qualities like trust, patience, understanding, co-operation, justice, peace, fraternity and respect for all religions. The Dialogue method provides ample scope for the students to discuss and share their ideas with the teachers in turn to be encouraged, guided or corrected as and when required.

Objectives of the Study

1. To compare the effectiveness of dialogue method in developing social values among secondary school students based on gender
2. To compare the effectiveness of dialogue method on the achievement in social science among secondary school students based on gender

Hypotheses of the Study

1. Secondary school students taught through dialogue method differ significantly in their social values with respect to gender.
2. Secondary school students taught through dialogue method differ significantly in their achievement in social science with respect to gender.

Methodology

For the present study experimental method was employed. The study was conducted among ninth standard students. Specially designed instructional material in social science based on dialogue method, an achievement test in social science, and a test to measure the social values in the lives of students were the tools used in the study. All the tools were developed by the investigators. After the experimental treatment, the gain scores of boys (N=20) and that of girls (N=20) for the achievement test and for the test to measure the social values were

compared using appropriate statistical techniques to validate the hypotheses of the study.

Analysis and Discussion

1. Effectiveness of dialogue method in developing social values among secondary school students based on gender

Before the experimental treatment, all the twenty boys and twenty girls were pre-tested to find out their initial awareness to social values through the test prepared by the investigators. They were then given the treatment, using the specially designed instructional material in dialogue method. After the treatment, all the students were post tested in order to determine the development of social values. The gain scores of the two groups were compared. The data and result of the test of significance of the difference between the mean gain scores are presented in table 1.

Table 1

Data and Result of the Test of Significance of the Difference between the Mean Gain Score of Secondary School Boys and that of Secondary School Girls

Category	N	M	S.D.	't' Value	Remark
Boys	20	6.40	3.75	4.51	Significant at .05 level
Girls	20	13.60	4.50		

The calculated 't' value, 4.51, is found to be greater than the table value, 2.02, at .05 level (*df* =38). Hence the null hypothesis "there is no significant difference between the gain scores on social value acquisition of the secondary school boys and that of secondary school girls" may be rejected. Thus it can be interpreted that there is significant difference in the acquisition of social values among secondary school students taught through dialogue method with respect to gender. The girls are more advantageous when compared to boys in acquiring social values through the dialogue method of teaching.

2. Effectiveness of dialogue method on the achievement in social science among secondary school students based on gender

All the twenty boys and twenty girls were pre-tested before the experimental treatment to find out their initial score on an achievement test

prepared by the investigators. They were then taught selected topics, using the specially designed instructional material in dialogue method. After the treatment, all the students were post tested using the same achievement test used as pre-test. The gain scores in the achievement of the two groups were compared. The data and result of the test of significance of the difference between the mean gain scores are presented in table 2.

Table 2
Data and Result of the Test of Significance of the Difference between the Mean Gain Score in Achievement of Secondary School Boys and that of Secondary School Girls

Category	N	M	S.D.	't' Value	Remark
Boys	20	17.68	3.28	1.07	Not significant at .05 level
Girls	20	18.93	3.95		

The calculated't' value, 1.07, is found to be less than the table value, 2.02, at .05 level (*df* =38). Hence the null hypothesis "there is no significant difference between the gain scores on achievement in social science of the secondary school boys and that of secondary school girls" cannot be rejected. Thus it can be interpreted that there is no significant difference in the enhancement of achievement in social science among secondary school students taught through dialogue method with respect to gender. The dialogue method is equally effective for secondary school girls and secondary school boys in enhancing their achievement in social science.

Conclusion

Dialogue method is significantly effective in the achievement of social science and also enhancing social values of both boys and girls of standard nine. The study also reveals that the effectiveness is significantly higher on girls than boys. This method could be implemented in both single sex and co-educational schools. Dialogue method could be implemented in the classroom for improving achievement in social science through the prescribed curriculum.

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AUTODIDACTICISM AND PROFESSIONAL DEVELOPMENT OF TEACHERS

Priya Dominic

Abstract

Autodidacticism (also termed autodidactism) or self-education is the act of learning a subject or subjects in which one has had little or no formal education. This is often referred to as self-instruction that takes place outside formal institutional settings. The paper presents a precise picture of the knowledge and skill required of the teachers of the present day world; who constantly need updates for the benefit of their learner community. It is impossible for teachers to gain professional development without the assistance from classrooms, school authorities, parents, colleagues and the community at large.

Introduction

The present day teachers are expected to regularly update certain knowledge and skills that are required of them for presentation/management of their day to day assignments. Avenues for professional developments may be abundant but it is important to have consistent efforts for professional development in the light of constantly changing technology. Autodidacticism (also autodidactism) or self-education is the act of learning a subject or subjects in which one has had little on no formal education. This is often referred to as self-instruction that takes place outside formal institutional settings. Teachers for their professional development first need to focus on teaching and learning rather than software and hardware. It should be designed prioritising what students are expected to know and to do in a specific subject, and then infusing ICTs into the teaching learning process so that acquisition of the knowledge and skills stays more efficient. Secondly, professional development is practically useless unless teachers are provided access to technological resources and have the time and support to apply the newly gained knowledge and skills. Thirdly, professional development is not a onetime affair; it should be focused on the needs of the faculty members and sustained through coaching and periodic appraisals.

Innovation and changes are not new; good educational leaders are constantly innovating as they strive to improve teaching and learning to obtain the best educational outcome for students. Innovations in the field of ICT always bring new practices into teaching and learning which leads to cyclic changes in the day to day practices in education (Resta, 2002). As the digital learning has

grown in prominence, a predictable debate has emerged; whether technology enabled instruction will be used primarily to replace teachers in a quest to save money. Digital advocates and media also stoke the fire. 'Just as the internet replaced telephone operators and the nightly news anchor as the default source of information teachers may be the next on the chopping board.' There is no doubt that the digital future will transform education, and it does not require an either or decision between technology and teachers; rather, digital education needs excellent teachers and the teaching profession needs digital education.

Teaching the digital natives

The generation of young people, who were born around 1990's may be called 'digital natives,' since they were born together with internet and mobile technologies. Typical knowledge practices for this generation are claimed to be multi-tasking, that is carrying out several activities side by side. The knowledge practices of young people have drastically changed during the last decade although the educational practices have largely remained the same. Today's students are no longer the people suited to our educational system which is designed 'to teach.' Time has come to think of reworking education for future; the builders of the new system should be familiar with the switches of technologies driving the changes in the present day system of education. Customisation, interaction and control are the keys to technology embedded instructions; customisation refers to providing learners the knowledge they want when they want it and supporting and guiding them as they learn. Interaction refers to the ability of computers to give learners immediate feedback and to engage learners through simulation in accomplishing realistic tasks. Control refers to putting learners in charge of their learning, so that they feel ownership and can direct their learning where their interests take them (Collins & Halverson, 2009).

Techno-Pedagogy, Content Knowledge and Autodidacticism

Technological knowledge, Pedagogical knowledge and Content knowledge are three main bodies of knowledge; knowing how to integrate ICT emerges from an understanding of these three bodies of knowledge and their interactions. The techno pedagogical content knowledge describes the synthesized knowledge of each of the three knowledge bodies mentioned above. Every teaching context is unique with varied interactions between technology, pedagogy and content; there is no universal or a 'one size fit all' solution to

problem of teaching. New technologies are driving necessary and inevitable change throughout the educational landscape and teachers of the modern days are challenged to take up these technologies for keeping pace with the new generation learners. Practice of autodidacticism can help in moulding oneself for becoming efficient teachers for the present day educational scenario. The process or practice of learning one subject without a teacher or formal education requires good insight and intrinsic motivation from the part of teachers.

Theoretical Perspectives of Autodidacticism

Going to the theoretical aspects autodidacticism adopts the idea of inquiry-based learning where learners identify their own research questions, and gain knowledge regarding the area. The perspectives of discovery learning can also be viewed with an inclination to understand the spirit of Autodidacticism. The new knowledge gained usually gets incorporated to the already existing ones and we can ultimately impose this to the technique of scaffolding proposed by Vygotsky. Success of professional development through self-education primarily requires self-discipline with good background knowledge of reflective practice and metacognitive awareness.

Researchers suggest that in education reflective practice is observed as a continuous process carried out by professionals for analysing their practice in order to identify what drives learner improvement as well as the impact of their values on learning and development. Reflection can be either internal or external; it can be self- reflection or may involve others. Reflection can be spontaneous or deliberately planned. Reflection can provide both the basis and motivation for further inquiry which serves as a guide for future behaviour to improve our practice and ultimately the outcome of learners. Reflection involves both cognitive and affective activities in which individuals engage to explore their experience in order to lead to new understanding and appreciation. (Dewey, 1933; Schön, 1983; Pollard, 2002; MacNaughton, 2003). Metacognition is an important concept of cognitive theory. It consists of two basic processes occurring simultaneously; monitoring your progress as you learn and making changes and adapting your strategies if you perceive you are not doing so well (Winn & Snyder, 1996). Metacognitive skills include taking conscious control of learning, planning and selecting strategies, monitoring the progress of learning, correcting the errors, analysing the effectiveness of learning strategies and changing learning

behaviours and strategies when necessary (Ridley, Schutz, Glanz & Weinsteir, 1992).

Professional Development through Partnerships

Today learner expectations have gone to such heights that the learners demand for active teacher – learner partnerships in educational settings; teachers are not expected to be a 'sage on the stage' or a 'guide on the side'. In broad terms teachers are to be change agents or activators and students proactive partners in learning. This not only requires radically new learning relationships between students and teachers but also among them. The emerging question with a strong teacher-learner partnership is how technology could be used to deepen and accelerate learning (Fullan, 2013). Professional development in the ICT context is an ongoing process, a lifelong learning; this dynamics of capacity building is the core of reciprocal tutoring: teachers through content transactions imbibe from their learners' new and emerging practices in ICT. The shared reciprocal teaching learning environment created helps both teachers and learners; teachers acquire modern ICT practices and learners in turn gain discipline specific knowledge.

The professional development of teacher educators is also highly essential in this context; unless teacher educators make effective use of technology in class rooms, it will not be possible to prepare a new generation of teachers who effectively use the new tools for learning. With ICTs learners often become teachers by way of peer tutoring or reciprocal mentoring. Indeed a teacher may reverse the teaching learning roles to facilitate learning; this can increase self-esteem, motivation and engagement of learners. The teacher's role changes to that of a manager or facilitator in many of these situations; as the teacher helps the expert communicate with the learners and scaffolds the learning process. The teachers also acquire professional development by learning from the expert.

Conclusion

The knowledge, awareness and practice of autodidacticism would lead to development of professional competency of teachers and would help teachers acquire and internalise new instructional techniques suitable to the present day learners. Professional development cannot be achieved in isolation; it requires help and assistance from those who work along with the teachers such as classroom assistants, school leaders, parents, colleagues etc. It is impossible for a

teacher to gain professional development without support and encouragement from the society to which s/he belongs; to bring this about these community members may also need professional development along with teachers (Resta, 2002). The above discussion has focused on certain new attitudes and skills necessary for teachers of the day. It also anticipates teachers to think of the necessary transformations required for successful existence in the modern educational scenario.

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EFFECTIVENESS OF VEDIC SUTRAS ON THE ACHIEVEMENT IN MATHEMATICS AMONG SECONDARY SCHOOL STUDENTS

Jisha Thomas

Abstract

Vedic Mathematics is a collection of Techniques/Sutras to solve mathematical arithmetics in easy and fast way. It consists of 16 Sutras (Formulae) and 13 sub-sutras (Sub Formulae) which can be used for problems involved in arithmetic, algebra, geometry, calculus, conics. The present study intends to find out the effectiveness of Vedic Sutras over the existing activity oriented method among secondary school students in their achievement in mathematics. Experimental method with non-equivalent pre test- post test design was adopted for the study. The study was conducted on a sample of two divisions of standard VIII of K. E. Carmel School, Muhamma, Alappuzha district. The result revealed that Vedic Sutras are effective in increasing students' achievement in mathematics.

Introduction

Education in all its fullness in this modern world is a process of transferring experience, skills, habits, values, and discoveries of past generations to the next and to induce a spirit of enthusiasm to know further. This process of transfer includes discussion, teaching, training, research, etc. Informal passing of such experiences and information from one person to another is also education. Education in its full vibrancy takes place under the guidance of competent and experienced people within the frame work of a well defined system. Autodidact learning also helps one to acquire knowledge, but has got its own limitations. Even attempts to quench the thirst for knowledge of a person to achieve greater level of thinking and to become more creative are also educational.

Mathematics is called the queen of sciences and is the fundamental base on which all planning is done and all structures are raised. Mathematics is a way of thinking and the path of enthusiasm. It is a universal aspect why mathematics is taken as a chest filled with so many valuable tools concerning the operations like measuring, weighing, and counting and helps in proper understanding of the nature's work and complicated problems of life by converting them into its language of signs and symbols. It helps us recognize patterns and to understand the world around us. Mathematics plays a vital, often unseen, role in many

aspects of modern life from sowing seeds in the field to space travel (Mangal, 2002).

Vedic mathematics is the name given to the ancient system of Indian mathematics which was re-discovered from the Vedas between 1911 and 1918 by Sri Bharati Krishna Thirthaji (1884-1960). According to his research all of mathematics is based on 16 Sutras, or word-formulae. These formulae describe the way the mind naturally works and are therefore a great help in directing the students to the appropriate method of solution (Kapoor, 2003).

Need and Significance of the Study

If mathematics is an omnipotent science in each and every breath, its propinquity should have been made apparent one way or the other in the formation of the universe itself and travelled through all its metamorphosis to the present level of existence. When problems are addressed and analyzed mathematically, solution comes at hand, evolvement becomes faster. The objectives of mathematical studies are not just to find solutions to surmount hurdles of examinations, but to emerge out and proceed to get through problems smoothly in life. To many students, mathematics is a hard nut to crack and find it cumbersome to become one with the soul of it. They must be well equipped to the maximum possible extend to be in the right track. The efficiency of mathematical solving of problems are mainly based on two things namely speed and accuracy. An adequate learning system is yet to emerge synchronizing both these factors. But if we go back to the ancient period, it is laudable indeed to note that there were unique techniques that existed based on simple rules and principles that exquisitely proved that speed and accuracy can go hand in hand.

Vedic mathematics is a powerful tool through which the speed of calculation can be enhanced, where speed is a striking skill in solving problems. Anyone can learn Vedic mathematics from an early age and this helps one to perform well in academics particularly in arithmetic. It also helps in increasing concentration and memory. Left part of the human brain is responsible for the language and processes in a logical and sequential order, while the right part or the right hemisphere is more visual, intuitive, holistic and random which energize memory and concentration abilities and as the calculations are done mentally, that works as an exercise in itself keeping brain and its thinking power in its maximum efficacy. This ancient system fully supports this theory in practice.

With a little practice one can make calculations easier, simpler and quicker so much so that one can call it "world's fastest mental maths system" which has applications in all branches of mathematics and is a favorite of competitive exam aspirants who want to tackle maximum problems in less time. It also compliments the conventional curriculum by acting as a powerful checking tool and goes to save precious time in examinations.

Objectives of the Study

1. To compare the achievement in mathematics of secondary school students taught through Vedic Sutras with that of students taught through present activity oriented method.
2. To compare the achievement in mathematics of secondary school students taught through Vedic Sutras with that of students taught through present activity oriented method under the objectives, knowledge and understanding.

Hypotheses of the Study

1. The achievement in mathematics of secondary school students taught through Vedic Sutras is significantly higher than that of students taught through present activity oriented method.
2. The achievement in mathematics of secondary school students taught through Vedic Sutras is significantly higher than that of students taught through present activity oriented method with regard to knowledge level.
3. The achievement in mathematics of secondary school students taught through Vedic Sutras is significantly higher than that of students taught through present activity oriented method with regard to understanding level.

Methodology

The present study intends to find out the effectiveness of Vedic Sutras over the existing activity oriented method among secondary school students in their achievement in mathematics. Experimental method with non-equivalent pre test- post test design was adopted for the study. The study was conducted on a sample of two divisions of standard VIII of K. E. Carmel School, Muhamma, Alappuzha district. One division was considered as experimental group and the other as control group. Lesson transcripts prepared based on Vedic Sutras and present activity oriented method and an achievement test in mathematics were

used as the tools for the study. The achievement of the students in both groups was compared by using ANCOVA.

Results and Discussion

1. Effectiveness of Vedic Sutras in comparison with the activity oriented method on the achievement in mathematics at secondary level

The pre-test and post-test scores of the experimental and control groups were subjected to analysis of covariance (ANCOVA) to determine the effectiveness of Vedic Sutras on the achievement in mathematics over the present activity oriented method. The adjusted means of post-test scores (Y means) of pupils in the experimental group and control group were computed. The difference between the adjusted Y means was tested for significance. The data for adjusted means of post test scores of pupils in experimental and control groups are given in table 1.

Table 1
Data for adjusted means of post-test scores of pupils in the experimental group and in the control group

Groups	N	M_x	M_y	M_{yx} (adjusted)
Control	40	6.5	14.3	14.346
Experimental	40	6.65	21.1	21.05
General means	80	6.575	17.7	

Adjusted Y means of post-test scores were tested for significance. The table value of *t* (df = 77) are 1.99 and 2.64 at .05 level and .01 level respectively. The calculated value of *t* is 9.991. Since the calculated value of t exceeds the table value, it is significant at .01 level. This significant difference between the adjusted Y means indicates that the two groups, (experimental and control) differ significantly in their achievement in the post-test. Since the adjusted mean of experimental group is greater than that of control group and the difference between the two means is statistically significant, it can be interpreted that learning through Vedic Sutras is more effective than the activity oriented method for increasing mathematics achievement at secondary level.

2. Effectiveness of Vedic Sutras in comparison with the activity oriented method on the achievement in mathematics at secondary level based on the objective knowledge

The pre-test and post-test scores of the experimental and control groups for the items under the objective knowledge were subjected to analysis of covariance (ANCOVA) to determine the effectiveness of Vedic Sutras in the achievement in mathematics over the activity oriented method with regard to the objective knowledge. The adjusted means of post-test scores (Y means) of pupils in the experimental and control groups were computed. The difference between the adjusted Y means was tested for significance. The data for adjusted means of post test scores of pupils in experimental and control groups are given in table 2.

Table 2

Data for adjusted means of post-test scores of pupils in experimental group and control group under the objective: knowledge

Groups	N	M_x	M_y	M_{yx} (adjusted)
Control	40	2.33	3.28	3.28
Experimental	40	2.35	4.3	4.3
General means	80	2.34	3.79	

Adjusted Y means of post-test scores were tested for significance. The table value of *t* (df = 77) are 1.99 and 2.64 at .05 level and .01 level respectively. The calculated value of t is 6.26. Since the calculated value of t is greater than the table value, it is significant at .01 level. This significant difference between the adjusted Y means indicates that the two groups, (experimental and control) differ significantly in their achievement in the post-test. The adjusted mean of experimental group is greater than that of the control group and the difference between the two means is statistically significant. Hence the above analysis shows that learning through Vedic Sutras is more effective than the prevailing activity oriented method for increasing mathematics achievement at secondary level with regard to the objective knowledge.

3. Effectiveness of Vedic Sutras in comparison with the prevailing activity oriented method on the achievement in mathematics at secondary level under the objective understanding

The pre-test and post-test scores of the experimental and control groups for the items under the objective understanding were subjected to analysis of covariance (ANCOVA) to determine the effectiveness of Vedic Sutras in the achievement in mathematics over the activity oriented method with regard to the objective understanding. The adjusted means of post-test scores (Y means) of pupils in the experimental and control groups were computed. The difference between the adjusted Y means was tested for significance. The data for adjusted means of post test scores of pupils in experimental and control groups are given in table 3.

Table 3
Data for adjusted means of post-test scores of pupils in experimental and control groups under the objective: understanding

Groups	N	M_x	M_y	M_{yx} (adjusted)
Control	40	3.43	7.05	6.96
Experimental	40	3.1	8.53	8.62
General means	80	3.263	7.79	

Adjusted Y means of post-test scores were tested for significance. The table value of *t* (df = 77) are 1.99 and 2.64 at .05 level and .01 level respectively. The calculated value of t is 4.17. Since the calculated value of t is greater than the table value, it is significant at .01 level. This significant difference between the adjusted Y means indicates that the two groups, (experimental and control) differ significantly in their achievement in the post-test. The adjusted mean of experimental group is greater than that of the control group and the difference between the two means is statistically significant. Thus the above analysis shows that learning through Vedic Sutras is more effective than the prevailing activity oriented method for increasing mathematics achievement at secondary level with regard to the objective understanding.

Educational Implications

The analysis of data revealed that Vedic Sutras are more effective than present activity oriented method in increasing students' achievement in

mathematics. Based on the above conclusions the following suggestions are offered as measures for improvement.

1. Vedic Sutras of teaching should be encouraged among schools and colleges since it has proved itself to be a more effective method.
2. Appropriate training for the teachers should be provided to adopt Vedic Sutras in the classroom.
3. The curriculum designers must be aware about the effectiveness of Vedic Sutras, so that they can arrange the lessons in accordance to use this method.
4. Vedic Sutras should be introduced during teacher's in-service training program. It will help the teachers to acquaint with this method.
5. Vedic Sutras can be incorporated with other instructional designs.

The results of the present study will be helpful to understand the effectiveness of Vedic Sutras in enhancing the achievement of the students at secondary level in mathematics. The findings of the study will be helpful for the teachers to practice this method for the better performance of the students in mathematics at secondary level. It will be helpful in the curriculum planning and preparation of text book. This study will motivate further investigators to carry out similar studies in other classes also.

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STAD STRATEGY OF CO-OPERATIVE LEARNING TO ENHANCE THE ACHIEVEMENT IN ACCOUNTANCY AT HIGHER SECONDARY LEVEL

Josen George and Thushara Menon

Abstract

The development of constructivist theories led to new conceptions of learning process and consequently various methods of learning came into existence. Present study examines the worth of STAD strategy of co-operative learning, which works on constructivist paradigm, in enhancing higher secondary school students' achievement in accountancy. A quasi-experimental method with non-equivalent groups pretest-posttest design was adopted for the study. The experiment was conducted among eleventh standard students. The results reveal the superiority of the experimental treatment in enhancing achievement in accountancy.

Introduction

Commerce came to be seriously considered for inclusion in courses of study from the first quarter of the 18th century. The education specially intended to prepare a person for competently taking up the duties and responsibilities of the business world - the world of industry, trade, and allied tasks can be termed as commerce education. Levert S. Lyon defined commerce education as, "any education which a businessman has and which makes him a better business man, is for him a business education, no matter whether it was obtained within the walls of a school or not" (Cited in Aggarwal, 1996). The explosion of information in science and technology has influenced every area of life, including commerce. The increasing complexity of commerce education in the present day world would make it obligatory for students to be conversant with modern principles and practices. In the present class room situation, it is a Herculean task to provide adequate learning experience to all the students and satisfy their individual needs. Various strategies and techniques for instruction have been tested in classrooms to their adequacy and effectiveness in enhancing objectives in education.

STAD strategy of Cooperative Learning

Learning to work co-operatively is an important activity for students at all levels. Co-operative learning is an often attempted but not well-understood approach to commerce instructions. In co-operative learning, students listen to group members and work with them to learn. Here the learners are active and

they make decisions. Co-operative learning students acquire, refine and master group interaction skills. It is a powerful method for increasing the quality and quantity of the students' learning. Student learning goals are competitive or individualistic efforts. The goal structures specify the way in which the student will interact with each other and the teacher during the interactional session. In the ideal classroom, all students will learn how to work autonomously.

Co-operative learning is one of the techniques which are extensively used in different subjects in different parts of the world in different socio-economic and cultural situations. Five essential elements are identified for the successful incorporation of co-operative learning in the classroom. The first and most important element is positive interdependence. The second element is individual and group accountability. The third element is (face to face) promotive interaction. The fourth element is teaching the students the required interpersonal and small group skills. The fifth element is group processing. Co-operative learning is a cluster of instructional strategies that involve students working collaboratively to reach common goals. One of the most well-known types of co-operative learning is called Student Teams Achievement Divisions (STAD) which uses four or five member teams to master basic skills topics. Students are placed in small groups (teams). The class in its entirety is presented with a lesson and the students are subsequently tested. Individuals are graded on the team's performance. Although the tests are taken individually, students are encouraged to work together to improve the overall performance of the group.

Significance of the Study

The teaching of accountancy is facing nowadays a significant challenge. It is recognized that the teaching methods can influence the achievement in accountancy. For teaching accountancy, teacher should encourage the active participation of students in the class room activities, for this teacher should adopt suitable teaching method. The present day class room situation is highly competitive which can be detrimental to some students. They enter the class with widely divergent skills and knowledge. Low achievers may lack the prerequisites to learn new material. In order to solve this problem, the present day class room situation is to be restructured to enhance co-operation, equality, and brotherhood. This problem can be solved through the adoption of a co-operative learning strategy. Co-operative learning stands for flexible instructional technique and strategies known as methods. Co-operative learning evolved in an effort to

increase student participation, provide students with leadership and group decision making experience and give students the chance to interact and learn with students from different cultural and ability backgrounds. Student Teams Achievement Divisions (STAD) is a form of co-operative learning that uses multi-ability learning teams to teach specific forms of content – facts, concepts, generalizations, principles, academic rules, and skills. Developed by Slavin (1995), it is one of the most popular co-operative learning strategies. This strategy helps the students to work co-operatively and to express their abilities and to give an opportunity to express their knowledge. It also ensures the participation of all the learners. From a careful review of literature conducted by the investigator it could be revealed that not much work has been done about STAD strategy in accountancy. Hence the investigator decided to make an attempt to study the effect of STAD strategy in accountancy achievement of students at higher secondary level.

Hypotheses of the Study

1. The accountancy achievement of secondary school students taught through STAD strategy is significantly higher than that of students taught through the activity oriented method.
2. The accountancy achievement of secondary school students taught through STAD strategy is significantly higher than that of students taught through the activity oriented method under the objective knowledge.
3. The accountancy achievement of secondary school students taught through STAD strategy is significantly higher than that of students taught through the activity oriented method under the objective understanding.
4. The accountancy achievement of secondary school students taught through STAD strategy is significantly higher than that of students taught through the activity oriented method under the objective application.

Objectives of the Study

1. To compare the achievement of secondary school students in accountancy taught through STAD strategy with that of students taught through the activity oriented method
2. To compare the achievement of secondary school students in accountancy taught through STAD strategy with that of students taught through the activity oriented method under the objectives knowledge, understanding, and application

Methodology in Brief

For the present study pre-test post-test non-equivalent group design of experimental method was employed. Two divisions of eleventh standards of Vocational Higher Secondary School, Kanichukulangara, Alappuzha district, Kerala were taken for the experiment. One division (N=40) was taught through activity oriented method which was treated as control group and the other through STAD strategy which was the experimental group (N=40). Same lessons were taught to the two groups. Before conducting the classes a pre-test to know the level of achievement regarding the selected lessons was administered to the experimental group as well as the control group. After treatment of the experimental group with think-pair-share technique, and control group with activity oriented method of teaching the same test was given as post test to both the groups. The difference in achievements of the two groups before and after treatment was subjected to statistical procedures to verify the hypotheses.

Results and Discussion

1. Effectiveness of STAD strategy in comparison with the activity oriented method on the achievement in accountancy at secondary level

The pre-test and post-test scores (total) of the experimental group and control group were subjected to analysis of covariance (ANCOVA) to determine the effectiveness of STAD strategy on the achievement in accountancy over the present activity oriented method. The adjusted means of post-test scores (Y means) of pupils in the experimental group and control group were computed. The difference between the adjusted Y means was tested for significance. The details are given in table 1.

Table 1

Data and result of the test of significance of the difference between adjusted means of post-test scores in the experimental group and in the control group

Group	N	M_x	M_y	M_{yx} (adjusted)	*t* value
Control	40	3.50	13.43	19.75	7.25 ($p < .01$)
Experimental	40	3.60	19.00	25.19	
General means	80	3.55	16.22		

The obtained value of *t*, 7.25, is greater than the table value, 2.64 (*df* = 77), at .01 level and the adjusted mean of experimental group is greater than that of control group. Hence it can be interpreted that learning through STAD strategy is more effective than the activity oriented method for increasing achievement in accountancy at secondary level.

2. Effectiveness of STAD strategy in comparison with the activity oriented method on the achievement in accountancy at secondary level based on the objective knowledge

The pre-test and post-test scores (under the objective knowledge) of the experimental group and control group were subjected to ANCOVA to determine the effectiveness of the experimental strategy. The difference between the adjusted Y means was tested for significance. The details are given in table 2.

Table 2
Data and result of the test of significance of the difference between adjusted means of post-test scores (under the objective knowledge) in the experimental group and in the control group

Group	N	M_x	M_y	M_{yx} (adjusted)	*t* value
Control	40	1.85	3.75	3.73	3.64 ($p< .01$)
Experimental	40	1.75	4.43	4.44	
General means		1.80	4.09		

The obtained value of *t*, 3.64, exceeds the table value, 2.64 (*df* = 77), at .01 level and the adjusted mean of experimental group is greater than that of control group. Hence it can be interpreted that learning through STAD strategy is more effective than the activity oriented method for increasing achievement in accountancy at secondary level with regard to the objective knowledge.

3. Effectiveness of STAD strategy in comparison with the activity oriented method on the achievement in accountancy at secondary level based on the objective understanding

The pre-test and post-test scores (under the objective understanding) of the experimental group and control group were subjected to ANCOVA to determine the effectiveness of the experimental strategy. The difference between the adjusted Y means was tested for significance. The details are given in table 3.

Table 3

Data and result of the test of significance of the difference between adjusted means of post-test scores (under the objective understanding) in the experimental group and in the control group

Group	N	M_x	M_y	M_{yx} (adjusted)	*t* value
Control	40	1.325	6.58	6.61	5.44 (p< .01)
Experimental	40	1.45	8.75	8.70	
General means		1.39	7.66		

The obtained value of *t*, 5.44, exceeds the table value, 2.64 (*df* = 77), at .01 level and the adjusted mean of experimental group is greater than that of control group. Hence it can be interpreted that learning through STAD strategy is more effective than the activity oriented method for increasing achievement in accountancy at secondary level with regard to the objective understanding.

4. Effectiveness of STAD strategy in comparison with the activity oriented method on the achievement in accountancy at secondary level based on the objective application

The pre-test and post-test scores (under the objective application) of the experimental group and control group were subjected to ANCOVA to determine the effectiveness of the think-pair-share technique. The difference between the adjusted Y means was tested for significance. The details are given in table 4.

Table 4

Data and result of the test of significance of the difference between adjusted means of post-test scores (under the objective application) in the experimental group and in the control group

Group	N	M_x	M_y	M_{yx} (adjusted)	*t* value
Control	40	0.325	3.05	3.10	4.75 (p< .01)
Experimental	40	0.4	5.82	5.77	
General means	80	0.362	4.43		

The obtained value of *t*, 4.75, exceeds the table value, 2.64 (*df* = 77), at .01 level. The adjusted mean of experimental group is greater than that of control

group. Hence it can be interpreted that learning through STAD strategy is more effective than the activity oriented method for increasing achievement in accountancy at secondary level with regard to the objective application.

In the present study the STAD strategy was found to be more effective than the existing method in increasing the total achievement in accountancy as well as achievement under various dimensions such as knowledge, understanding, and application among secondary school students. Findings of the present study are in agreement with that found in Yeung (2015). Similar findings have been reported in Wafa (2013), Usulor and Benjamin (2013), Tone, et al. (2012), Zarei (2012), Alijanian (2012) and Benjamin (2012). The findings reported in these studies indicate that the students using STAD strategy have higher achievement scores than students using conventional methods.

Conclusion

Learning of accountancy is a difficult task to a large number of students due to various reasons. "Accountancy anxiety" is a serious problem that is not amenable to easy solutions. Because of the avoidance strategies that develop from the fear and anxiety associated with accountancy, students learn and memorize it without understanding. STAD strategy is a solution for this problem faced by the students. The findings of the present study show that cooperative learning using STAD strategy is more effective than the existing method in increasing students' achievement in accountancy. Therefore it may be recommended that STAD strategy should be encouraged among schools and colleges since it has proved itself to be a more effective method. Appropriate training for the teachers should also be provided to adopt STAD strategy in the classroom.

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POEMS OF SUGATHAKUMARI: AN IMPETUS FOR WOMEN EMPOWERMENT

Sareena Rose V. S.

Abstract

In the present world there are living legends, who through their words and deeds are trying to find their own identity. Poetess Sugathakumari's literary works is an eye opener in today's society where values are deteriorating. She as writer and as an activist is fighting against the immoralities of the society. Through her life she is showing light to many. Sugathakumari, the famous Malayalam poetess is not limiting herself in words; she gave wings to her words and let it fly beyond the limits of the society. Her courage, bravery and true spirit should be praised. As a poet Sugathakumari's poems are praiseworthy. Different phases of human life and nature is purely presented with simple language and unique style. Among the contemporary poets Sugathakumari has a difference in her attitudes towards the poetry and life around her.

Introduction

Books are the gateways of knowledge. It motivates, encourages, restricts, supports and advises a person in all phases of life. A child should be taught not merely to read, to write and to do arithmetic. In schools, special care should be given to reading books. Teacher should motivate the children to find themselves, and get acquainted with literature other than their usual learning materials. A child will be connected to the outside world if he gets acquainted with books. It can mould a human for the society. Society of this day, needs individuals who are educated enough to pave the path and direct its members to the right way. Every child is born talented. Talents should be recognized and nurtured appropriately through education.

A woman is a mother, sister, daughter, wife, home maker and much beyond. But she is considered as the weaker section of society and this weaker section of society is massively exploited beyond limit. Daily we come across news of rapes, harassment and atrocities against women and children. We have to raise our hand and voice against these immoral practices. Women's commission and other agencies are working for the welfare of women. Among them poetess Sugathakumari is an outstanding figure who is brightening up the life of many. Where authorities and offices failed, poetess Sugathakumari won by her determination. She saved the lives of mentally ill women of a Government run

mental hospital whose lives were in the rags of dirt. She had won many honours for her enormous effort to help the downtrodden.

Need for the study

Poetess Sugathakumari is an asset to our society. Her pure heart and sensitive nature is reflected in her poetry. Poetry can be considered as a supreme form of art, where words are precise but pregnant with thoughts and feelings. She follows traditional style in writing poetry with simple language and high sensitivity. With ease she projects her feelings and emotions. To put the feelings into words is not a simple process. Sugathakumari is a person who likes to write and think about even a simple incident in life which has disturbed her mind, which needs the attention of the society. She carries a pen and paper always with her. As a poet her poems are supportive, consoling, spiritual and empowering.

A study on the works and efforts of poetess Sugathakumari for the empowerment of women is a necessity. As a famous personality of Kerala, she became a model for each and everyone. Her contributions to the humanity should pass on to the coming generations. Poetess Sugathakumari has given action to her voice; she is in the forefront of all human welfare activities in Kerala state. She is a poetess, a nature conservationist, and a woman activist. So a serious study on her vision, thoughts and writings will be benefiting us to keep the values of life and education.

Objectives

1. To identify the views of Sugathakumari regarding the essence of womanhood as depicted her poetry.
2. To study the efforts of Sugathakumari towards the empowerment of women in the society.

Methodology

The investigator used the case study method to conduct the present study, as she intended to make a detailed analysis of the contribution of poetess Sugathakumari regarding women empowerment. Along with the case study method the researcher also used the content analysis method, as this research work analyses the poetical works of Sugathakumari. The methodology used to carry out this research study is case study based on content analysis.

Analysis and Discussion

The views of Sugathakumari regarding the essence of womanhood as depicted in her poetry

A woman is a symbol of love and sacrifice. She is a passionate mother, a loving sister, a responsible wife and a sacrificing lover. A woman knows the journey of life, no matter how uneven, rocky, and rough the roads. It is this risky path that gives her strength and makes her strong.

The poems of Sugathakumari, the renowned poetess of Kerala, make an odyssey into the very essence of womanhood. Her poetry probes the psychology and tensions that lie behind the submissive and docile façade of Indian women. She tries to bring forth the psycho social realities that stifle a woman's identity. The injustice and violence against women and children is highlighted in the poetry of Sugathakumari in all its stark nakedness. Her poetry navigates through the psychological subtleties of man-woman relationship. The quest for love and identity of a woman in the society is clearly projected in her writings.

Sugathakumari's poetic spirit is so high that she rewrites the epic of Radha and Krishna's love story. She portrays the self-reliant and self sufficient woman of the twentieth century who turns her back at the sympathy the world shows. Radha needs nothing less than love from Krishna. The poetry of Sugathakumari presents heroines who reject men, who reject them. A total inversion of epic is seen in poetry like 'Pada Prathista' (Worship of the feet) and Ramayana Rangam (A scene from Ramayana). With the time the tone of the poetry of the poetess Sugathakumari changed to the sad cries of women. Gender disparities and victimization of women conquer the words of her poetry. The sad cries and sorrows became the theme of her poetry.

Sugathakumari's Sthreeparvam (Woman Canto) project the miserable predicament of a woman in a largely male dominant society. The cry of a housewife, who lost herself in the four walls of a house is skillfully drawn by the poetess. The poem is like a dramatic monologue where she is conversing with her memories. The naked truth of a housewife who lived for her family is portrayed here.

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The helplessness of women is depicted in the poetry "Kollunnathengane?" It is the cry of all women who love their children. The society had changed a lot. Human beings are becoming cannibals. The craving for pleasure and money has made the human more selfish. They are not thinking about anything other than themselves. The weaker section of the society is getting exploited in every single second, especially women and children. The various levels at which a girl child is exploited are exposed in 'Penkunju 90' (Girl child 90). In the darkness of the night, the speaker of the poem, a mother, places her illegitimate girl child, a little Sita, as she calls her, on the lap of mother earth. She asks:

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(s]ൺlpഞ്ഞv – 1990, Xpemhർjപ്പച്ച)

The eco-feminist attitude in the poetry of Sugathakumari advocates human life to be reconnected with nature and envisions the developments of a partnership ethic built on the grounds of mutual respect. The women and nature become embodiment of consolation and comfort in the poems of Sugathakumari. The poem 'Kadalinodu' (To the sea) symbolizes the sea as a woman who brings consolation to her eternal lover, who has come to her shore at various stages of his life - childhood, youth, with his wife, with his children and at last as lone old man. The lover discloses his feeling thus:

lpfnർamdnൽത്തmWpabങ്ങphmൻ, imന്തn–

bdnbmൻ ho□ pw \o hnfnപ്പXpw tlൾsക്ക

AKm[amw tകഷm``cnXamw \nsന്bpcmKത്തnsന്

{]NWvUamw iകതnതുcnXൻ amZIതുcnbnൽ kzbw

adന്p Rmൻ ho□ papWcpന്q, ho□ pw

Hcp sImSpഞ്mgmbv]pWcpന്q \nsന!

The poetess Sugathakumari envisions a refreshed attitude towards the approach of women in this patriarchal society. She gives the message to the women of this world that they should be proud of their womanhood. The genuine concern at the plight of women and the destiny seems to be the impelling force behind her poetry. Love seems to be poetic creed and it is her faith in love that enables her to dream even on the verge of disaster, a better world for women, free from physical and mental bondage. Through her poetry Sugathakumari tries to establish an individuality and identity to women.

The efforts of Sugathakumari towards empowerment of women in the society

In a society everyone has a key role to play. Their interaction with each other builds the social system. Gender doesn't make any difference. But from early society onwards men were considered as powerful and fearless. They are hard working members in the social system for bringing up the family. Women were considered as the weaker section. They are meant for housekeeping, giving birth to children and nurturing them. Centuries and decades passed but the disparity prevails. From generation to generation the discrimination survives. In this twenty first century, things are getting worse. Women are exploited widely. Physically and mentally women are tortured every moment all over the world.

Kerala, the God's own country has hundred percent literacy. Kerala has a high percentage of highly qualified or 'educated women'. But the paradox is that in spite of higher development in health care and gender equality, there is relatively little space for women in leadership and empowering roles and to articulate their voice in public and private life.

Born in 1934, poetess Sugathakumari (to Bodheswaran, a freedom fighter, and Karthiyayini Amma a known scholar and teacher of Sanskrit) was inspired by her father's writing as well as his strong beliefs. Her father's ideals of patriotism and sacrifice influenced her and gave her strength in the struggles for rights.

Sugathakumari was brought up in an atmosphere that had lot to do with the world of letters. Here first and foremost passion is writing even though her mind and action is diverted to do something for the betterment of the deprived and the exploited section of the society.

Sugathakumari's poetic work often reflected and addressed the appalling and pathetic situation of life that she lived in. She had a firm and clear vision and understanding of the changes taking place in the society and never missed a chance to make her voice heard which often forced authorities to sit, listen and pursue an acceptable course of action.

Sugathakumari's confidence and hard work led her to start 'Abhaya' a refugee home for destitute women and day care centre for the mentally ill. In the year 1985, Poetess Sugathakumari laid the foundation for Abhayagramam for the helpless, especially women who suffer. Sugathakumari herself says that it was a turning point in her life. Her deep concern for the mentally ill women in the government mental hospital, Thiruvananthapuram, led her to the dark side of the sufferings of women. From that time onwards the poetess knocked at the doors of government and the judiciary to open their eye towards the issue. The most significant achievement of 'Abhaya' was that, after 150 years of isolation, the mental hospitals of the state were thrown open to public scrutiny and consequently the mental health scenario of Kerala has undergone a healthy change. This venture of Abhaya can be considered as the greatest achievement for the ill-treated women in Kerala.

In the year 1996 Sugathakumari became the first chairperson of the women's commission, Kerala. It was a breakthrough in the poetess's life as well as for the society of Kerala. She helped the needy without any hesitation. Her acceptance of the Women's Commission's chair revealed the power the seat had. Many laws were brought to the public scrutiny. The curtains which hide the authority of the commission from the public were widely opened, which helped to serve the public and empower the weaker section of the society. The culprits were brought before the public because of her impartial intervention. She showed the public that laws can be implemented without political or religious interference. She was fearless to express her opinion in a strong way.

For her tireless work she was honoured with many awards. She received the Bhatia Award for social science, the Sacred Soul International Award, and the

Lakshmi Award for social science. In 2006, she was honoured with Padmashree, country's fourth highest Civilian honour.

Sugathakumari's view on women empowerment

> "The status of women at present had gone 50 steps behind compared to the post independence period" - Poetess Sugathakumari.

Sugathakumari can be considered as the woman of the era. The path she walks is thorny, but her strong will leads her, by blooming flowers on the thorns. She is becoming a cool breeze for the needy and a threat to the corrupt. Her campaigns are for the well being of the society. The poetess wants to empower the whole humanity; woman empowerment is just a part of it.

The life of the great poetess of Malayalam is an open book of values and she is the personification of values. She has a personality that never stops in front of money and fame. She never extends her hand and bows her head in front of power and wealth. She has the patience to understand the sorrow of others and she finds time to be with them. She never stops to raise voice against the corrupt bureaucrats. She respects herself and respects womanhood. She is the pride of this world.

Conclusion

The renowned poetess Smt. Sugathakumari tries to draw attention of the public towards the exploitation of women. Her works depicts the reality of women in the society. She demands a renovation in the attitude of society to help the needy and helpless. Today's world is witnessing a great erosion of values. Educational system has the responsibility to bring change to the present situation. The poetry of Sugathakumari has the power to bring humanitarian effect in the learner. Sugathakumari's enterprise 'Abhaya' and her struggles for the empowerment of women are praiseworthy. In this modern era the inculcation of values of womanhood is becoming a necessity. By giving proper education to the young generation we can redeem the situation upto a limit. The poetess never leaves the hope for a better future. She tells the women flock 'to be respectful'and to respect one's own self.

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SOCIAL MATURITY AND TEACHIHNG ATTITUDE OF STUDENT TEACHERS IN KERALA

Jameela P. N.

Abstract

The present study explores the relationship between social maturity and teaching attitude of student teachers. Normative survey method has been adopted for the present study. Stratified random sampling was employed for the selection of the sample. The tools used for the study were social maturity scale and teacher attitude inventory. The sample includes 400 student teachers of B.Ed training colleges. For analyzing the data, statistical techniques such as arithmetic mean, standard deviation, critical ratio and correlation coefficient were employed. The study concluded that there is significant relationship between social maturity and teaching attitude of student teachers.

Introduction

One of the most important characteristics of modern society is the quest for information and knowledge. The central aspect of teaching learning system is the attitude of teachers. It is necessary to maximize the effectiveness of society which directly depends on the effectiveness of its teachers. A thorough study of the literature by the investigator revealed that a positive attitude towards the profession will make teaching effective and thus will help for raising the standard of the students. Teachers shall have a positive attitude towards their profession and they should show respect and interest in their work. Education has been regarded both as an end in itself and also a means of realizing other desirable ends. Social maturity is the degree of social participation as measured by the child's attitudes, activities and interest and it is related to physical growth and mental ability. Social maturity of a person determines his ability to interact with the society as a whole. Attitude is a learned and more or less generalized and

effective tendency to respond in a persistent and characteristic manner usually positively or negatively to some situations, ideas or materials (Young, 1994). It is considered as a mental and neural set of readiness exerting a direct dynamic influence upon individual's response to all objects and situations with which it is related. Teaching attitude is the attitude towards teaching. The role of the teachers lies in the fact that the adequacy of the educational programme is determined to a large extent by the quality of teaching. The strength of an educational system depends on the efficiency of teachers. Of all the different factors which influence the quality of education and its contribution to the national development, the quality, competence of teachers are undoubtedly the most significant.

Teacher Education Institutions play significant role in developing not only intellectual or emotional maturity but also social maturity. These institutions train the future teachers in all aspects related to social maturity through various modes to serve for better cause. Social maturity attained in a natural setting or artificial setting is prompted by the efforts of a well trained teacher working in these institutions. S/he imparts the knowledge about the society, its rules and norms to the students which is helpful for students to solve their social problems. A socially mature teacher becomes self-reliant in the sense that he develops self-direction of effort and learns efficiency to use his time, control his emotions, develops sense to deal with the different people in the society, develop gentle personal relationships, acquire the quality of adjustment, co-operation, sacrifice, independence, etc. He develops the ability to make judgments, decisions and take proper actions when faced with a problem and critical issues. Thus, more the socially mature the teacher is more will be the social maturity among students and the more mature will be the society and the nation. Taking these things into consideration the investigator felt a need to know about the social maturity of student teachers of Kerala. Study conducted by Vora (1980) to analyze the social maturity of students of colleges of education concluded that the student teachers coming from the urban areas were more mature than the student teachers from the rural areas as well as male student teachers were superior to female student teachers. Chand (2007) conducted a study on social maturity among student teachers and concluded that both male and female student teachers belonging to rural and urban localities did not differ from each other on personal adequacy and interpersonal adequacy dimensions of social maturity. In the present study the investigator decided to measure the variables namely social maturity and teaching attitude of student teachers.

Hypotheses of the Study

1. There will be significant difference in mean scores of teaching attitude of student teachers classified on the basis of sex and locality.
2. There will be significant difference in mean scores of social maturity of student teachers classified on the basis of sex and locality.
3. There will be significant relationship between social maturity and teaching attitude of the student teachers in the total sample.

Objectives of the Study

1. To compare the mean scores of teaching attitude of subsamples classified on the basis of sex and locality.
2. To compare the mean scores of social maturity of subsamples classified on the basis of sex and locality.
3. To find out whether there exist any significant relationship between social maturity and teaching attitude of student teachers in total sample.

Methodology in Brief

The present study is an attempt to analyze social maturity and teaching attitude of student teachers in Kerala. Normative survey method was used for the collection of data. The sample consisted of 400 B.Ed trainees from eight revenue districts of Kerala. Social maturity scale and teaching attitude inventory were the tools used to collect the data for the study. The analysis of the data was carried out by using appropriate statistical techniques such as Critical Ratio and Karl Pearson's Product Moment Correlation Coefficient.

Results and Discussion

Table 1

Data and result of the test of significance of difference between mean social maturity scores of male and female student teachers

Gender	Number	Mean	Standard Deviation	Critical Ratio	Level of significance
Male	200	221	10.681	10.65	p<.01
Female	200	232	9.956		

From the table 1, it is found that the obtained t value (10.65) is greater than table value (2.58) and is significant at .01 level. Therefore the hypothesis,

there will be significant difference in mean scores of social maturity of male and female student teachers is accepted.

Table 2
Data and result of the test significance of the difference between mean social maturity scores of rural and urban student teachers

Locality	Number	Mean	Standard Deviation	Critical Ratio	Level of significance
Rural	200	236.23	9.858	6.28	p<.01
Urban	200	242.04	8.594		

From the table 2, it can be found that the obtained t value (6.28) is greater than the table value (2.58) and is significant at .01 level. Therefore the hypothesis, there will be significant difference in the mean scores of rural and urban student teachers is accepted.

Table 3
Data and result of the test of significance of the difference between mean Teacher Attitude scores of male and female student teachers

Gender	Number	Mean	Standard Deviation	Critical Ratio	Level of significance
Male	200	235.36	7.684	3.987	p<.01
Female	200	232.78	8.917		

Table 3 shows that the differences in mean scores of teaching attitude of male and female student teachers are significant at 0.01 level. Therefore the hypothesis, there will be significant difference in mean scores of Teaching Attitude student teachers is accepted.

Table 4
Data and result of the test of significance of the difference between means Teacher Attitude scores of rural and urban student teachers

Locality	Number	Mean	Standard Deviation	Critical Ratio	Level of significance

Rural	200	237.18	8.859	3.108	p<.01
Urban	200	239.26	8.239		

Table 4 shows that the difference in the mean scores Teacher Attitudes of rural and urban teacher students is significant at .01 level. Therefore the hypothesis, there will be significant difference in mean scores of teacher attitude between rural and urban student teachers is accepted.

Table 5
Data showing the correlation between Social Maturity and Teaching Attitude of Student Teachers

Variable	Number	Correlation 'r'	Level of significance
Social Maturity & Teacher Attitude	400	.378	p<.01

From Table 5, it is found that the value of coefficient correlation obtained is .378, which indicates that there exists a moderate relationship between Social Maturity and Teaching Attitude of Student Teachers in the total sample.

Educational Implications

Social maturity and teaching attitude are two important areas which need great attention in the field of education. The present study made an attempt to find out the correlation between social maturity and teaching attitude of student teachers among Kerala state. Attitude of teaching is one of the essential components of curriculum transaction. Taking into consideration the significance of attitude of teaching without any doubt, it can be said that the research will be an asset in this field. It is hoped that a study of this kind may revolutionize the teaching and learning as a whole.

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EFFECTIVENESS OF 7E INSTRUCTIONAL MODEL ON THE ACHIEVEMENT IN PHYSICS AMONG SECONDARY SCHOOL STUDENTS

Sreeja S. and Geethu Joseph

Abstract

The 7E instructional model of teaching helps teachers to overcome the static nature of the traditional approaches followed in the teaching process and make the class more lively and dynamic. The present study explores the effectiveness of the 7E instructional model in enhancing the achievement in physics at secondary level. The study was conducted among 80 students of Christ Raj High school, Valiyathovala, Idukki. Quasi-experimental design was adopted for the study. The experimental group was taught through the 7E model while the control group by traditional method. The performances of control group and that of experimental group were compared before and after experimentation. Results indicate a superiority of the experimental group over the control group thus establishing the effectiveness of the 7E instructional model.

Background of the Study

There is a definite purpose underlined in all educational activities. It enables an individual to realize his highest self and goal. Teachers could achieve this only by the lived example of their lives manifested in hundreds of small and big transactions with students in word and deed. Teaching is the achievement of shared meaning. It is a tool not only for providing information and guiding students, but also for inculcating values among them. Science curriculum is a part of the general curriculum and it plays an important role in the development of the innate potentialities of the child. Science is included in the school curriculum because it contributes to the development of personality of the child and to the welfare of society. The method adopted by the teacher has a great influence in the teaching learning process. The theory of constructivism encourages educators to focus on making connection between facts that are required and tailoring instructional strategies that allow students to actively construct meaning and foster understanding of objectives. The 7E instructional

model of teaching helps physics teachers to overcome the static nature of the traditional approaches followed in the teaching process and make the class more lively and dynamic (Joyce & Weil, 1985).

Science teachers continuously strive to improve their instructional practices to enhance student learning. There has been a shift in thinking about learning towards a view where learning is seen not as a passive representation but an active reconstruction and re interpretation of experiences. Teaching methods are crucial factors that affect the academic achievement of students. To teach children successfully requires an understanding of how children think and construct scientific knowledge. Classroom environments that incorporate constructivism and inquiry into their daily organization can allow students the chance to 'think scientifically' and to carry out investigations in a focused, collaborative, and meaningful manner (Polman, 2000). In science education, there is a need to add new models that aim both cognitive development in students and eliciting and eliminating students' misconceptions. Student's misconceptions in science, specifically in physics are common and universal in scope. The students' achievement and attitude towards physics can be intensified when taking into consideration as well as overcoming their misconceptions on the subject. 7E model is an instructional strategy which assesses student's misconceptions and promotes conceptual change. And this also promotes scientific understanding and thinking abilities among students. The lesson structure is based on 7Es presented in a particular sequence namely Elicit, Engage, Explore, Explain, Elaborate, Evaluate and Extend. Therefore, this study has aimed to examining the effectiveness of 7E instructional model on the achievement in physics among secondary school students.

Hypotheses of the Study

1. The Achievement in physics of secondary school students taught through 7E Instructional model is significantly higher than that of students taught through existing activity oriented method.
2. The Achievement in physics of secondary school students taught through 7E Instructional model is significantly higher than that of students taught through existing activity oriented method under the domains – knowledge, application, creativity, and process

Objectives of the Study

1. To compare the achievement in physics of secondary school students taught through 7E Instructional model and that of students taught through existing activity oriented method.
2. To compare the achievement in physics of secondary school students taught through 7E Instructional model and that of students taught through existing activity oriented method under the following domains– knowledge, application, creativity, and process

Methodology in Brief

For the present study pretest posttest non-equivalent group design of experimental method was employed. Two divisions of eighth standards of Christ Raj High school, Valiyathovala, Idukki were taken for the experiment. One division was taught through activity oriented method which was treated as control group (N=40) and the other through 7E instructional model which was the experimental group (N=40). Same lessons were taught to the two groups. Before conducting the classes a pre-test to know the level of achievement regarding the selected lessons was administered to the experimental group and control group. After treatment of the experimental group with 7E instructional model, and control group with activity oriented method of teaching the same test was given as post test to both the groups. The difference in achievements of the two groups before and after treatment was subjected to statistical procedures to verify the hypotheses.

Conclusions Based on Findings of the Study

The major conclusions based on the findings and analyses of test scores are presented below.

1. 7E Instructional Model is more effective than existing activity oriented method to increase the total achievement in physics among secondary school students.

a. The mean post-test scores of experimental group taught through 7E Instructional Model was found to be greater than that of control group taught through existing activity oriented method (M_{ctrl}= 12.44; M_{exptl}= 18.53; CR = 7.35, $p<.01$). This implies the superiority of the experimental group.

b. The analysis of variance of pre-test and post-test scores of pupils in the experimental and control group showed that there is significant difference between means of post-test scores of two group (Fy =53.98; p<.01). This indicates that experimental group has superiority over control group.
c. The analysis of covariance of pre-test and post-test scores of pupils in experimental and control groups showed that there is significant difference between means of the post-test scores of two groups (Fyx =69.11; p<.01). This implies that experimental group has superiority over control group.
d. The comparison of the adjusted means of post-test scores of pupils in experimental group and control group shows that the difference them is statistically significant. The adjusted mean of post-test scores of experimental group Myx = 12.52 and that of the control group is Myx = 18.45. The obtained t value (t = 8.32; p<.01) is also significant and this confirms that the experimental group is superior to control group in terms of total achievement in physics.

2. 7E Instructional Model is more effective than the existing activity oriented method to increase the achievement in physics among secondary school students under the objective knowledge.

a. The analysis of variance of scores of pupils in experimental and control group for knowledge level questions in the pre-test and post-test showed that there is significant difference between means of the post-test scores of two groups (Fy =12.32; p<.01). This indicates that the experimental group is superior to control group in achievement under the objective knowledge.
b. The analysis of covariance of scores of pupils in experimental and control groups for knowledge level questions in the pre-test and post-test showed that there is significant difference between means of the post-test scores of two groups (Fyx = 15.09:p<.01). This implies that experimental group exceeds control group in achievement under the objective knowledge.
c. The adjusted mean of post-test scores of experimental group Myx = 4.88 and that of control group is Myx = 3.78. The obtained t value (t = 3.89; p<.01) is significant. This confirms that experimental group is superior to control group in terms of achievement in knowledge level.

3. 7E Instructional Model is more effective than the existing activity oriented method to increase the achievement in physics among secondary school students under the objective application.

a. The analysis of variance of scores of pupils in experimental and control group for application level questions in the pre-test and post-test showed that there is significant difference between means of the post-test scores of two groups (Fy = 50.3; p<.01). This indicates that the experimental group is superior to control group in achievement under the objective application.
b. The analysis of covariance of scores of pupils in experimental and control groups for application level questions in the pre-test and post-test showed that there is significant difference between means of the post-test scores of two groups (Fyx = 50.58:p<.01). This implies that experimental group exceeds control group in achievement under the objective application.
c. The adjusted mean of post-test scores of experimental group Myx = 5.44 and that of control group is Myx = 3.27. The obtained t value (t = 7.13; p<.01) is significant. This confirms that experimental group is superior to control group in terms of achievement in application level.

4. 7E Instructional Model is more effective than the existing activity oriented method to increase the achievement in physics among secondary school students under the objective creativity

a. The analysis of variance of scores of pupils in experimental and control group for creativity level questions in the pre-test and post-test showed that there is significant difference between means of the post-test scores of two groups (Fy = 40.46; p<.01). This indicates that the experimental group is superior to control group in achievement under the objective creativity.
b. The analysis of covariance of scores of pupils in experimental and control groups for creativity level questions in the pre-test and post-test showed that there is significantly difference between means of the post-test scores of two groups (Fyx = 40.07; p<.01). This implies that experimental group exceeds control group in achievement under the objective creativity.
c. The adjusted mean of post-test scores of experimental group Myx = 4.33 and that of control group is Myx =2.69. The obtained t value (t =6.33;

p<.01) is significant. This confirms that experimental group is superior to control group in terms of achievement in creativity level.

5. 7E Instructional Model is more effective than the existing activity oriented method to increasing the achievement in physics among secondary school students under the objective process.

a. The analysis of variance of scores of pupils in experimental and control group for process level questions in the pre-test and post-test showed that there is significant difference between means of the post-test scores of two groups (Fy = 18.65; p<.01). This indicates that the experimental group is superior to control group in achievement under the objective process.
b. The analysis of covariance of scores of pupils in experimental and control groups for process level questions in the pre-test and post-test showed that there is significantly difference between means of the post-test scores of two groups (Fyx = 18.01; p<.01). This implies that experimental group exceeds control group in achievement under the objective process.
c. The adjusted mean of post-test scores of experimental group Myx = 3.85 and that of control group is Myx = 2.70. The obtained t value (t = 4.25; p<.01) is significant. This confirms that experimental group is superior to control group in terms of achievement in process level.

Conclusion

The findings of the present study revealed the effectiveness of 7E Instructional Model in enhancing the achievement in physics among secondary school students. According to (Akanwa & Ovute, 2014) when constructivist model is applied in physics teaching at secondary school, higher achievement and higher interest are enhanced. Since the constructivist mode is innovative and effective, physics teachers are enjoined to adopt it in teaching physics. The findings of the study recommended the teachers to practice this method for the better performance of the students in physics at secondary level. It is helpful in curriculum planning, preparation of text books and providing supplementary teaching materials.

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YOGA PRACTICE AND MENTAL HEALTH STATUS AMONG HIGHER SECONDARY SCHOOL STUDENTS

Lucy Fernandez

Abstract

To live in harmony with oneself and the environment, it is necessary to inculcate physical, mental, social and spiritual health in children. When the body is physically healthy, the mind becomes clear, focused and stress comes under control. Practicing yoga helps children to attain overall development in these areas. The present study is intended to find out the effectiveness of yoga on mental health status of higher secondary school students. The normative survey method was adopted for the study. For the present study, a representative sample of 1365 higher secondary school students from different schools of Ernakulam and Calicut district was selected. Mental Health Status Scale developed by Sanandaraj and Gireesan (1988) was used for the collection of data. Mean, standard deviation and critical ratio were used to analyze the data. The results of the study revealed that there is significant difference in the Mental Health Status of yoga practicing and non practicing higher secondary school students.

Introduction

Mental health is a socially constructed and socially defined concept. Mental health is a level of psychological well-being, or an absence of a mental disorder (Graham, 2014). Mental health is a term generally used to describe one's psychological and emotional well-being. Being mentally healthy is more than the absence of mental illness; it is a complete state of physical, mental and social well-being. It is the ability to enjoy life, function well in society, bounce back from adversity, and go through every day life with little or no difficulty. Healthy mind rests in healthy body. In order to have healthy mind, proper physical health

of body needs to be essential. Mental health therefore may refer to a sound mental condition or a state of psychological well-being or freedom from mental diseases. One's body and mind function harmoniously; it is said that a sound mind exists in a sound body in so much so that any understanding of personality requires proper analysis of body and mind. Mental health, thus, is the full and harmonious functioning of the whole personality (Hadfield, 1952). Yoga, which is a way of life, is characterized by balanced health, harmony and bliss. The science of yoga is a powerful stream of knowledge, which enables the practitioners to achieve radiant physical health, serene mind, spiritual uplift, and the ability for harmonious social living (Bussing, 2012).

The practice of yoga helps children and young people to cope with stress and thus contributes positively to mental health. Yoga in schools helps students improve resilience, mood and self regulation skills pertaining to emotions and stress. Yoga is used as a potential tool for the youth to deal with stress and to regulate themselves. The present study compares the mental health status of yoga practicing and non yoga practicing higher secondary school students.

Need and Significance of the Study

Education is a process for the development of individuality. The physical, mental, emotional and spiritual development of an individual can take place through education. Thus education must cater for the complete development of a nation. The aim of yoga is to calm the chase of conflicting impulses and thoughts. Yoga is a part of an integrated arts therapy program that also includes music, art and dance. Yoga helps children navigate the stress of daily life and practicing yoga helps their bodies, brain and hearts feel calm. Yoga is a self-empowering process which instils within its practitioners a confidence and a deep internal knowledge of the subtle and grosses (Bonney, 1960). Yoga also brings self-control in children, which is the main requirement and a great tool in the present scenario. Students, especially boys tend to get short tempered fast, who indulge themselves in unnecessary calamities. Yoga is a systematic method for increasing and maintaining physical and mental health. It uses postures, breathing exercises and simple forms of meditation. Yoga is very effective in helping to come to terms with some of the routine and more challenging experiences of life.

If an individual is mentally healthy he can tackle his life problems effectively. A student, who practices yoga, always possesses good academic performance, as well as develops good qualities through different postures or

Asanas. An understanding of the importance of yoga in relation to the mental health status will certainly help in providing the right kind of education and guidance for the development of the personality of the students. In this regard, the investigator took up a systematic study to compare the mental health status of yoga practicing and non practicing higher secondary school students.

Hypotheses of the Study

1. There is significant difference between the mental health status of Yoga-practicing and non-practicing higher secondary school students in the total sample.
2. There is significant difference between the mental health status of Yoga-practicing and non-practicing female higher secondary school students.
3. There is significant difference between the mental health status of Yoga-practicing and non-practicing male higher secondary school students.

Objectives of the Study

1. To compare the mental health status of yoga practicing and non practicing higher secondary school students in the total sample
2. To compare the mental health status of yoga practicing and non practicing female higher secondary school students
3. To compare the mental health status of yoga practicing and non practicing male higher secondary school students

Methodology in Brief

The normative survey method was adopted for the study, as it was found to be the most appropriate method for collecting data. For the present study, a representative sample of 1365 higher secondary school students from different schools of Ernakulam and Calicut district was selected. While selecting the sample due representation was given to factors such as gender and locality of the school. Mental Health Status Scale developed by Sanandaraj and Gireesan (1988) was used for the collection of data. Mean, percentage, standard deviation and critical ratio were used to analyze the data.

Analysis and discussion

Comparison of mental health status of yoga practicing and non practicing higher secondary school students in the total sample

Table 1

The data and results of mental health status scores of yoga practicing and non-practicing higher secondary school students in the total sample

Variable	Category	N	Mean	Standard Deviation	t-value	Level of significance
Mental health status	Yoga practicing	667	267.10	7.62	47.478	p <.01
	Non yoga practicing	698	240.65	12.31		

The mean score of mental health status scores of yoga practicing higher secondary school students is 267.10 and that of non yoga practicing students is 240.65 which indicate that the yoga practicing students have more mental health status than that of non yoga practicing students. The t-test conducted to verify this is found to be significant. So it can be concluded that there is significant difference in mental health status of yoga practicing and non yoga practicing higher secondary school students.

Comparison of mental health status of yoga practicing and non practicing female higher secondary school students

Table 2

Data and results of mental health status scores of yoga practicing and non yoga practicing female higher secondary school students

Variable	Category	N	Mean	Standard Deviation	t-value	Level of significance
Mental health status	Yoga practicing	291	266.64	7.73	33.906	p <.01
	Non yoga practicing	390	238.81	12.31		

The mean score of mental health status of yoga practicing female higher secondary school students is 266.64 and that of non yoga practicing female students is 238.81 which indicate that the yoga practicing female students have more mental health status than that of non yoga practicing students. The t- test conducted to verify this is found to be significant. So it can be concluded that there is significant difference in mental health status of yoga practicing and non yoga higher female secondary school students.

Comparison of mental health status of yoga practicing and non practicing male higher secondary school students

Table 3
Data and results of the mental health status scores of yoga practicing and non yoga practicing male higher secondary school students

Variable	Category	N	Mean	Standard Deviation	t-value	Level of significance
Mental health status	Yoga practicing	376	267.45	7.52	32.642	<0.01
	Non yoga practicing	308	242.99	11.92		

The mean score of mental health status of yoga practicing male higher secondary school students is 267.45 and that of non yoga practicing male students is 242.99 which indicate that the yoga practicing male students have more mental health status than that of non yoga practicing students. The t-test conducted to verify this is found to be significant. So it can be concluded that there is significant difference in mental health status of yoga practicing and non yoga practicing male higher secondary school students.

Conclusions

1. There is significant difference in the mental health status of yoga practicing and non practicing higher secondary school students.
2. There is significant difference in the mental health status of yoga practicing and non yoga practicing female higher secondary school students.
3. There is significant difference between in the mental health status of yoga practicing and non practicing male higher secondary school students.

Educational Implications of the Study

The present investigation compared the mental health status of yoga practicing and non yoga practicing higher secondary school students. The results of the study indicate that yoga has great influence on the mental health status of the students irrespective of their gender and domicile. Based on the findings of the study the following suggestions are formulated:

- Yoga based education programmes could be conducted in school to develop the awareness about yoga among students.

- Yoga education should be made compulsory in every school with regular yoga practices and with well trained yoga teachers.
- Various yoga programmes like:
    a. Talk by yoga experts
    b. Demonstration of yoga exercises
    c. Talk on the benefits of yoga in stress reduction
    d. In-service training for teachers

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