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SANTHOM JOURNAL OF EDU RACE

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Dr. Sr. Christina Augustine
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EDITOR'S NOTE

Educational journals are very important in making teachers well aware of the new trends, discoveries, innovations and updated knowledge in the subject that they are teaching. In the present educational scenario role of the teacher is to facilitate the student for constructing knowledge by themselves. Teachers who are not updated with current discoveries and research findings will not be capable of enabling and guiding their students in the process of their knowledge construction. They will be unaware that the teaching methods they use and the things they teach are no longer accepted. But in such a situation findings of various educational researches will help them to open their eyes to view the field more critically and become more vibrant and creative in their field.

Based on the above mentioned facts we intend to bring about a partnership between schools, colleges of education, with group of teachers working hand in hand to promote the quality of schools and school education altogether. The academic journal, **Santhom Journal of Edu RACE** (Santhom Journal of Educational Researches and Curriculum Enrichment) is published and distributed in consonance with this objective.

The present volume of the journal brings to its readers twelve articles pertaining to different aspects of educational domain. It includes articles related to Teacher Trainees Preparedness, Interpersonal Intelligence, Scientific Interest, Experiential Learning, Self-concept and Anxiety, Environmental Awareness, Inclusive Education, Use of Whatsapp and Polya's Heuristic Approach.

We expect that all the articles presented in this issue will provide a medium for dissemination of educational research findings and exchange of experiences among research workers, scholars, teacher-educators, teachers and others interested in educational research and related fields and professions.

Editor

Invitation for Articles / Research Papers

Authors are invited to contribute articles on contemporary issues in education in general and Indian education in particular for publication in Santhom Journal of Edu. RACE.

The articles may be sent as an e-mail attachment in MS Word to: stmprincipal123@gmail.com. Also send three printed/typed copies to :

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Chief Editor
Santhom Journal of Edu. RACE

CONTENTS

Teacher Trainees Preparedness for Effective Classroom Teaching During Teaching Practice : A Case Study of Yobe State University, Damaturu, Nigeria

James Audu Ngada

Abstract

This research assessed student teachers preparedness for effective classroom teaching during teaching practice; Yobe State University, Damaturu education students; 2012/ 2013 set. Questionnaire was used to collect data. 50 student teachers were randomly selected as the sample for the study. The data collected was analysed using frequencies and mean scores. A mean score of 2.5 was accepted. The result showed that student teachers were adequately prepared for their teaching practice both theoretically, academically and in micro teaching practicum. Student teachers were also assisted in their schools of teaching practice though most of them were not accommodated and fed. Student teachers were able to put into practice the theories and knowledge learnt in the University. It was recommended that student teachers should be well accommodated in practising schools to enable them participate very well and actively in all school programmes and activities.

Key Words *: Teacher trainee, Preparedness, Classroom teaching, Teaching practice, Microteaching etc.*

Introduction

The quality of education provided in any society and the nature of change effected by that education are both dependable on the quality of teachers and the effectiveness of their teaching in schools (Awotua-Efebo, 1999). The ability to produce quality teachers depended much on the training they have in their preparation as professional teachers. This professional training is usually manifested in the areas of micro teaching and teaching practice where the trainee teachers are expected to put into practice the theoretical knowledge acquired in the classroom in the areas of methodology, classroom management and learning theories.

Mann, 1995 in Andabai (2013) stressed that, the impact of teaching practice on trainee teachers in tertiary institutions has been of interest to researchers, Government, teachers and parents as well. Similarly Obagah (2000) defines teaching practice as the performance of the kind of activities that results in learning. Koko (2002) remarked that, teaching practice in most educational institutions is the expected terminal behaviour of a student teacher who is going through professional course in education. Practice teaching occupies a key

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position in the programme of teacher education. It is the culminating experience in teacher preparation Nnamdi, 2000 in Andabai (2013). Adagba (2005) opined that this exercise provides opportunity to beginning teachers to become socialised into the profession. Ajoku (2002) observed that, performance during practice teaching provide some basis for predicting future success of the trainee teacher and it is an indicator of quality of teachers to be produced.

Edem (2003), observed that during practice teaching, working with students in schools provide a high degree of emotional involvement of a mostly positive nature. Murray, 2007 in Andabai (2013) asserted that, during practice teaching, the trainee teachers feel engaged, challenged and even empowered. Imart (2003) observed that practice teaching is an essential aspect of teacher education as it prepares them for their future teaching roles and assignment. Hyon, 1991 in Andabai (2013) observed that as agents that implement educational policies they have to be properly organised and teaching practice helps in this function.

Teaching practice exposes the trainee teachers to the realities of effective teaching and helps them to try out methods of teaching and gain practical classroom experience under expert supervision. In Nigeria, during the teaching practice, the trainee teachers are sent out from their institutions to primary, secondary, commercial and technical schools to teach for a period of time as part of their training Wellington, 2006 in Andabai (2013). During teaching practice, Andabai (2011) pointed out that a student is supervised and evaluated not only by a supervisor from his institution but also by a staff of the school in which he

is teaching. Akpomi (2001) pointed out that the use of multiple supervisors ensures that the trainee teacher is properly corrected and graded.

Good teaching is perhaps the most critical part of a solid education. Good teaching isn't an accidental one. Surely some teachers have a gift to help students learn. But knowledge of the learning process, child development and academic content are all important components good teaching. Good teaching is only possible by good teachers. This is all possible through good preparations of the teacher trainees by the institutions they attended. This paper seeks to find out whether student trainee teachers of Yobe State University, Damaturu were adequately prepared both theoretically and practically and whether the teaching practice period gave them the required experiences needed for their professional training as future teachers.

Objectives of the Study

The objectives of this study are to determine whether:

1. Student teachers were given enough preparations for their teaching practice.

2. Student teachers were assisted in their schools of teaching practice.

3. Student teachers were able to practice some of the knowledge learnt theoretically in their practising schools.

Research Questions

The study sought to answer the following questions:

1. Were student teachers given enough preparations for the teaching practice?

2. Were student teachers assisted by schools of their teaching practice in areas of their needs?

3. Were student teachers able to put into practice most of the knowledge learnt theoretically?

Methodology

The research design adopted for this study was the survey design. It helped to survey the opinion of student teachers of Yobe State University on their experiences in teaching practice. The population of the study consisted of all the first set of education students in the university who graduated in 2012/2013 session. Using random sampling technique 50 students were selected in the sample.

The instrument used for data collection was a rating scale consisting of 16 items. The items were structured on a four point scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The items were designed with the assistance of measurement and evaluation experts who ascertained face and construct validity of the instrument. Test and re-test reliability method was used for the reliability of the instrument. Reliability co-efficient of 0.759 was obtained using Pearson correlation co-efficient technique.

The instrument was administered directly to the respondents by the researcher. All completed copies of the administered questionnaire were retrieved within two (2) days. The data analysis technique used was percentages and mean scores. Any item with a mean score of 2.5 and above is considered as acceptable while any one below 2.5 is considered as unacceptable.

Data Analysis and Results

The results of the study are shown below:

Research Question 1: Were student teachers given enough preparations for their teaching practice?

Table 1

Frequency and mean scores of trainee teacher's responses on preparation for teaching practice.

Sl.No	Items	Mean	Remarks
1	You were given enough knowledge to equip you for teaching practice	3.68	Agreed
2	You were taught how to prepare good lesson plans	3.88	Agreed
3	You had micro teaching practicum before embarking on classroom teaching	3.47	Agreed
4	You had enough theoretical knowledge on learners which prepared you to deal with your students easily	3.53	Agreed
5	Learning theories were taught which helped you to find teaching in the classroom much easier	3.54	Agreed

Table 1 shows that all the items means ranged above 2.5 and that showed that the students were given adequate preparations in theories, knowledge and micro teaching practicum skills to equip them for the practical teaching in their schools of teaching.

Research Question 2 : Were student teachers assisted by schools of their teaching practice in all areas of needs?

Table 2

Student teachers responses on assistance received from practising schools in all areas of their needs

Sl.No	Items	Mean	Remarks
6	You were posted to the school of your choice for teaching practice and this made the teaching good.	3.38	Agreed
7	You were assigned a regular teacher in your school who helped you in your planning and teaching.	2.96	Agreed
8	You always teach using a good lesson plan	3.74	Agreed
9	Adequate teaching materials were provided to you which made your teaching much easier	2.98	Agreed
10	Feeding was provided to you in your school to alleviate feeding problem	1.69	Disagreed
11	Accommodation was provided to you	1.73	Disagreed

Items 6-9 in table 2 above showed that trainees accepted that they were posted to schools of their choice, they were assigned regular teachers to assist them, they alwayas write good lesson plans and adequate teaching materials were provided. However items 10 and 11 were not accepted because most of them were not accommodated and fed in the schools of their teaching practice as they scored below the mean score of 2.5.

Research Question 3: Were student teachers able to put into practice most of the knowledge they were taught in university?

Table 3

Student teachers responses on whether they were able to put into practice the knowledge learnt in university

Sl.No	Items	Mean	Remarks
12	You participated actively in all administrative activities of the school.	3.28	Agreed
13	Interaction with teachers and school administration was cordial and you enjoyed it.	3.55	Agreed
14	You like teaching because your students are happy with your work.	3.71	Agreed
15	Cooperation from the school made teaching practice more enjoyable.	3.68	Agreed
16	Enough training on record keeping was received in your school of teaching.	2.98	Agreed

In table 3 all the items were accepted by the respondents. They were assigned responsibilities, interacted with teachers and school administration, enjoyed their teaching practice because students were happy with their teaching, they had training on record keeping and cooperation existed between them and the school authorities.

Discussions

Findings with regards to question 1 showed that students were given enough knowledge to equip them for teaching as a mean of 3.68 was recorded. This showed that knowledge on classroom management and record keeping was given. Student teachers also agreed that they were taught how to prepare good lesson plans as this attracted a mean of 3.88. This mean showed that almost all the student teachers had thorough knowledge on how to write good lesson plans and this must have helped them teach very well. Micro teaching practicum was also practised by the student teachers as it attracted a mean of 3.47. Micro teaching practicum was an essential component for preparing student teachers for the practical teaching. Student teachers also accepted that enough theoretical knowledge on learners was given to them before embarking on teaching practice as this item scored a mean of 3.53. This helped the student teachers to be able to deal with their students easily on individual basis. The student teachers also agreed that learning theories they acquired made teaching in the classroom easier as it attracted a mean of 3.54.

Responses to research question 2 showed that four of the six items were accepted while two were not. Student teachers agreed they were mostly posted to schools of their choice which attracted a mean of 3.38. This showed that student teachers interest was considered and that would ease their three months stay in the schools. Also student teachers responses showed they were assigned regular teachers to work with them in their schools of teaching practice as it attracted a mean of 2.96. As this is slightly above the 2.5 mean score acceptance level, it is an indication that not all of them might actually have been assigned regular teachers to work with who should help them in handling planning, classroom management and record keeping. However it is an indication that student teachers were not left on their own. Item 8 had a mean of 3.74 showing that student teachers were always teaching using good lesson plans. This equally showed that where student teachers are working with regular teachers they were able to plan very well and teach successfully in their classes.

Adequate teaching materials were given to the student teachers as this attracted a mean of 2.98. Student teachers agreed they were given teaching materials which will include textbooks, charts and teaching aids for successful teaching. The student teachers disagreed that they were fed in their schools of teaching practice as this attracted a mean of 1.69. This might have been so as a result of most of the student teachers being posted to schools of their choice which showed they were either in schools within their localities or at home. Similar to feeding is the issue of accommodation which attracted a mean of 1.73. This also indicated that because they were posted to schools of their choice which must have been within their localities, they were not given accommodation. In other words they were accommodating themselves within their family houses. However, as student teachers if they had been accommodated in

the schools, that would have given them wider experiences which would make them participate more actively in all activities of the schools such as supervising night preps, bed checks, evening games and many others.

Findings to research question 3 showed that all items were accepted by the student teachers as all the mean scores above the 2.5 acceptance level. A mean of 3.28 was recorded against item 12 which stated student teachers participated actively in all administrative activities of the schools of their teaching practice. Student teachers were able to practice administrative and academic activities such as class masters, duty masters, form masters, game masters and even house masters. Item 13 attracted a mean of 3.55 where it stated student teachers interacted with teachers and school administrators. This is possible in staff meetings and at departmental levels and even with the regular teachers assigned to them. Item 14 attracted a mean score of 3.71. Here student teachers said they like teaching because their students were happy with their work. This is possible as they plan very well, work with regular teachers and realise individuality of their students in their teaching. Cooperation from schools made teaching practice enjoyable by the teacher trainees as this item 15 attracted a mean of 3.68. Cooperating schools provided teaching materials to them, assigned them administrative activities and interacted with them regularly made their teaching easier. Finally item 16 had a mean score of 2.98. Student teachers agreed they had enough training on record keeping. They were expected to conduct exams and enter students individual records, enter weekly and daily record of works and report correctly in the duty report books of teachers on duty. All these assisted them to be able to practise record keeping in their respective schools.

Conclusion and Recommendations

This study has shown that student teachers from Yobe State University were exposed to good preparations before embarking on practice teaching. They all agreed that knowledge on learning theories, micro teaching theory and practicum and lesson planning were adequately provided before they embarked on the teaching practice. Also the findings showed that the student teachers were posted to schools of their choice and adequate teaching materials were provided but feeding and accommodation were not well taken cared of. The findings also showed that they were able to put into practice most of the knowledge and theories learnt into practice in the schools of their teaching practice.

Based on the findings of this study, the following recommendations are made:

1. Student teachers should be accommodated in schools where there are boarding facilities.

2. Student teachers should be assisted in the area of feeding.

3. Regular teachers should be assigned to each student teacher and most preferrably professionally trained teachers.

4. Teaching materials and facilities should be provided adequately to student teachers to alleviate their teaching.

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Relationship Between Interpersonal Intelligence and Achievement in Mathematics of Students at Secondary Level in Kerala State

Sreeraj K. G.
T. V. Thulasidharan

Abstract

Intelligence is considered as the capacity to solve problems or to make new trend products that are evaluated in one or more cultural setting. Interpersonal intelligence is dealt with the capacity to understand the feelings, mind and desires of other people. It involves the ability of the people to work effectively with others. The present study is intended to findout the relationship between Achievement in Mathematics and Interpersonal intelligence of students at secondary school level. For this 200 students were selected through stratified random sampling technique giving due representation to the variables gender, school locale and type of management of the school. An Interpersonal intelligence scale and a test in Achievement in Mathematics were used for data collection. The data was analysed using the test of significance of difference between means and coefficient of correlation. The result showed that the relation between Achievement in Mathematics and Interpersonal intelligence is significant. It was also revealed that there is significant difference between the coefficient of correlations of male and female students and rural and urban school students. But no significant difference between Government and Private school students.

Key Words : Interpersonal intelligence, Developmental psychology, Cognitive psychology, Neurological research, Multiple intelligence etc.

Introduction

Howard Gardner studied about the developmental and cognitive psychology. He tried to make a place for arts in the field of psychology. In 1967 Howard Gardner become a member of a basic research group 'Project Zero'at Howard Graduate school of education. At first Gardner engaged in the neurological research. Gardner made numerous inventions with Norman Geschwind   about the conditions of normal and gifted children who have misfortune of different brain damages. They found that patients who are alexic but not a graphic lose their ability to read numbers, name objects and normal writing. Gardner worked there and comprehend the structure of human abilities in human brain.

In the year 1975 Gardner published the book 'The Shattered Mind', described about how different parts of the brain are dominant for

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different cognitive functions. In 1976 he wrote an outline for a book with title 'Kinds of Minds'. It described about different human faculties. Later this book was published by the name 'Frames of Mind'. The members of the project on Human Potential were expected to work out on the nature of human potential and its peculiarities. At that time Gardner wrote a book about human cognition. This was based on the discoveries in the biological and behavioural sciences. This was the first research program that led to the theory of Multiple Intelligences.

> "Persons who have interpersonal intelligence prefer to be with other people. They are friendly and can get on well with others so they can easily take part in social activities. Cooperative and collaborative surroundings are best for their learning. The people who can express empathy for others' feelings, react to their moods and grasp other perspectives usually appear in this group. They like studying in groups and exchanging information with others" (Teele, 2000). People having Interpersonal intelligence may engage in group works much time, use cooperative learning for class activities, arrange peer coaching during the production of an artwork.

This component of intelligence means person-to-person way of interaction. "If this person-to-person way of knowing is more developed in us, we learn through personal interactions. We probably have lots of friends show a great deal of empathy for other people and exhibit a deep understanding of other's points of view. We are also probably skilled in conflict resolution, mediation, and finding compromise when people are in radical opposition to each other

In our educational system, Mathematics is a basic part. Mathematics is the abstract study of quantity and space. It is better model of real things. The mathematical calculations develop future predictions about our nature. Mathematics develops a step by step study of the figures and objects through logical reasoning and abstract concepts (Kneebone, 1963)

Mathematics teachers often complain about their struggle to get their students' concentration in the class.Some students feel Mathematics difficult. Some of them feels Mathematics boring and to some extent useless. Actually Mathematics is an art like music. It should be taught by teachers who love it. (Anice James 2005, Clawson, 2004). The investigator found some students with much interaction with others showed some eagerness to learn Mathematics. So a study based on the relationship between interpersonal intelligence and achievement in Mathematics was felt as necessary.

Objectives of the Study

1. To find out the Interpersonal intelligence of secondary level students for the total sample

2. To find out whether there is any significant relationship between the Achievement in Mathematics and Interpersonal intelligence for the total sample.

3. To find out whether there is any significant relationship between the Achievement in Mathematics and Interpersonal intelligence for subsamples based on gender.

4. To find out whether there is any significant relationship between the Achievement in Mathematics and Interpersonal intelligence for subsamples based on locality.

5. To find out whether there is any significant relationship between the Achievement in Mathematics and Interpersonal intelligence for subsamples based on management of schools.

Hypotheses

1. There is significant relationship between the Achievement in Mathematics and Interpersonal Intelligence of students at secondary level.

2. There is significant correlation between the Achievement in Mathematics and Interpersonal Intelligence of students at secondary level based on gender

3. There is significant correlation between the Achievement in Mathematics and Interpersonal Intelligence of students at secondary level based on locality of schools.

4. There is significant correlation between the Achievement in Mathematics and Interpersonal Intelligence of students at secondary level based on management of schools.

Methodology

In the present study survey method was used. The sample consists of 200 students from 7 schools who are studying in standard IX in Pathanamthitta district. For selecting the sample due representation was given to different strata like gender, management and locality.

Tools Used for the Study

1. The test of Interpersonal Intelligence (Thulasidharan and Sreeraj)
2. The Achievement test in Mathematics

The Standardisation of the Test of Interpersonal Intelligence

For the standardisation, a draft tool consisting of 70 items was prepared through discussion with experts in the field of education. These 70 items were presented to a sample of 370 students of different strata. After item analysis 25 items were selected for the final test. Validity ensured through opinion of experts and reliability was determined by using split-half method. The reliability was 0.99

Statistical Techniques Used

1. Karl Pearson's correlation coefficients is used to study the relationship between Interpersonal Intelligence and the Achievement in Mathematics.

2. Fisher's Z-transformation test.

Analysis and Interpretation

The descriptive statistics mean, standard deviation, skewness and kurtosis for the Interpersonal Intelligence scores were calculated and it is presented in table 1

Table 1

Descriptive statistics of score for Interpersonal Intelligence

Variable	N	Mean	Std. Deviation	Skewness	Kurtosis
Inter-personal intelligence	200	78.76	22.00	-1.19	0 . 7 9

The mean Interpersonal intelligence is 78.76 with standard deviation 22. The skewness of inter-personal intelligence is -1.19 which is slightly negatively skewed and the kurtosis is 0.79, which is a little leptokurtic. Thus with respect to the Interpersonal intelligence, the distribution of students is slightly negatively skewed

Correlation Analysis

The correlation between the Achievement in Mathematics and the

Interpersonal Intelligence for the total sample was calculated using Karl Pearson's correlation coefficient. The values obtained are presented in table 2.

Table   2

Karl Pearson's correlation coefficient between Interpersonal Intelligence and Achievement in Mathematics

Variables	Sample Size (N)	Degrees of Freedom	Coefficient of Correlation
Interpersonal intelligence	200	198	0.553 **
Achievement in Mathematics	200		

Select ** Significant at 0.01 level of significance

The correlation coefficient of Mathematics Achievement and Interpersonal Intelligence is .553. This shows that the relation is moderate.

The table value shows that interpersonal intelligence is positively correlated to the Achievement in Mathematics and is significant at 0.01 level of significance (sig. <0.01). It indicates that the relation between the Interpersonal Intelligence and Achievement in Mathematics is significant.

Relationship between the Interpersonal intelligence and Achievement in Mathematics with Respect to Gender

To check the difference in the amount of relationship (correlation coefficients) of Achievement in Mathematics and Interpersonal intelligence between male and female students, Karl Pearson's correlation coefficients for both sets were computed separately. The correlation coefficient of Achievement and Interpersonal Intelligence of males is 0.517 and that of females is 0.597. Both the correlation coefficients are significant at 0.01 level of significance.

Then to compare the amount of relationship between male and female, the equality of the respective correlation coefficients were tested by Fisher's Z transformation test for equality of correlation coefficients. Its results are given in table 3

Table 3

Fisher's Z-transformation test for the equality of correlation coefficients of Achievement in Mathematics and the Interpersonal Intelligencein between male and female students.

Variables	Coefficients of Correlation for		Fisher's Z-transformation test for the equality of correlation coefficients	
	Male r_1	Female r_2	Z-value	Sig. P values
Interpersonal Intelligence	0.517	0.597	-2.25	0.0244
Achievement in Mathematics				

The Z-transformation test shows that correlation coefficients between Achievement in Mathematics and Interpersonal intelligence of male and female students is significantly different at 0.01 level of significance.

Relationship between the Interpersonal Intelligence and Achievement in Mathematics of Rural and Urban School Students

To check the difference in the amount of relationship (correlation coefficients) of Achievement in Mathematics and Interpersonal intelligence between rural and urban school students, Karl Pearson's correlation coefficients for both sets were computed separately. The correlation coefficient of Achievement in Mathematics and Interpersonal Intelligence are 0.515 and 0.593 respectively for rural and urban school students. Both the correlation coefficients are significant at 0.01 level. Then tested their significance of difference using Fisher's Z-transformation test. Results are presented in table 4.

Table 4

Fisher's Z-transformation test for the equality of correlation coefficients of Achievement in Mathematics and the Interpersonal Intelligence between rural and urban students.

Variabales	Coefficients of Correlation for		Fisher's Z-transformation test for the equality of correlation coefficients	
	Rural r_1	Urban r_2	Z-value	Sig. P values
Interpersonal intelligence	0.515	0.593	-2.18	0.0293
Achievement in Mathematics				

The Z-transformation test shows that there is significant difference in correlation coefficients between Achievement in Mathematics and Interpersonal intelligence of rural and urban school students. The difference is significant at 0.01 level.

Relationship between the Interpersonal Intelligence and Achievement in Mathematics for Government and Private School Students.

To check the difference in the amount of relationship (correlation coefficients) of Achievement in Mathematics and Interpersonal Intelligence between Government and Private school students, Karl Pearson's correlation coefficients are computed for both sets. The correlation coefficient of Achievement in Mathematics and Interpersonal Intelligence is 0.570 for Government school students and 0.530 for Private school students. Both the correlation coefficients are significant at 0.01 level. Then tested their significance using Fisher's Z transformation test. Results are presented in table 5.

Table 5

Fisher's Z-transformation test for the equality of correlation coefficients of Achievement in Mathematics and the* Interpersonal Intelligence *between Government and Private school students.

Variables	Coefficients of Correlation for		Fisher's Z-transformation test for the equality of correlation coefficients	
	Government r_1	Private r_2	Z-value	Sig. P values
Interpersonal Intelligence	0.570	0.530	1.08	0.285
Achievement in Mathematics				

The Z-transformation test shows that there is no significant difference in correlation coefficients between Achievement in Mathematics and Interpersonal Intelligence of Government and Private school students. This means that the amount of relationship between Achievement in Mathematics and Interpersonal intelligence is not significantly different in the case of Government and Private school students.

Conclusions

1. The mean Interpersonal intelligence is 78.76 with standard deviation 22. The skewness of inter-personal intelligence is -1.19**.** The r value calculated shows that correlation coefficients between Achievement in Mathematics and Interpersonal Intelligence of male and female students is significantly different at 0.01 level of significance.

2. The correlation coefficients of Achievement in Mathematics and Interpersonal Intelligence are 0.517 for male and 0.597 for female students. Both the correlation coefficients are significant at 0.01 level.

The Fisher's Z-transformation test shows that there is significant difference in correlation coefficients between Achievement in Mathematics and Interpersonal Intelligence of rural and urban school students.

3. The Z-transformation test shows that there is significant difference in correlation coefficients between Achievement in Mathematics and Interpersonal Intelligence of rural and urban school students. This is significantly different at .01 level of significance

4. The correlation coefficient of Achievement in Mathematics and Interpersonal Intelligence are 0.570 for Government school students and 0.530 for Private school students. Both the correlation coefficients are significant at 0.01 level.

5. The correlation analysis shows that Interpersonal Intelligence is positively correlated to the Achievement in Mathematics and is significant at 0.01 level. It indicates the relation between the Interpersonal Intelligence and Achievement in Mathematics is significant.

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Scientific Interest among Secondary School Students

Viswalakshmi T. V.
T. C. Thankachan

Abstract

A common goal shared by many science educators is to help students develop a genuine and long-lasting interest in science because interest has the potential to enhance the quality of learning and increase the likelihood that students will continue learning outside the classroom. Constructivist learning environment fosters the Scientific Interest in students through different learning activities. The main aim of Science education is to create natural curiosity and interest among the children and they seem to be scientist at heart. Scientific Interest is a positive feeling towards science and complete absorption in scientific inquiry. This motivated the investigator to assess the Scientific Interest among secondary school students. The main objectives of the study are, to find out the level of Scientific Interest among Students of Standard Nine and to find out the significance difference if any between the Means of the scores on Scientific Interest among Students of Standard Nine with respect to gender and medium of instruction. Survey method is selected for the study and the Science Interest Inventory was used to collect data. Major findings of the study are, (a) Most of the students have moderate Scientific Interest, only few students have high Scientific Interest (b) There is no significant difference in Scientific Interest among boys and girls, (c) There is no significant difference in Scientific Interest among English medium and Malayalam medium students. In order to develop Scientific Interest, the science class room should be enriched with full of scientific experiments and activities. Activities that were " Hands-on" in nature and allowed for engagement with technology elicited higher interest. There is a need to place more emphasis on the role of activity in constructing interesting learning environments, and in the mean time, suggests that student science interest could be improved by making changes to relatively easy- to-manipulate aspects of learning environments.

Key Words : *Scientific Interest, Constructivism, Science Interest Inventory etc.*

Introduction

Recent studies show that as children grow, their interests in science tend to decline (Dawson, 2000; Bae, 2003; Osborne, 2003). Especially, science text-books have many theories, which are difficult for some students to understand. Judging from my personal experience, it is boring for a student to study science topics and difficult to know it's value without interest. An understanding of science

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makes it possible for everyone to share in the richness and excitement of comprehending the natural world. Scientific literacy enables people to use scientific principles and processes in making personal decisions and to participate in discussions of scientific issues that affect society. National Policy on Education (1992) states,"….. Science educators have the role of providing such scientifically literate citizens to the nation. To fulfill its expectations, citizens should be scientifically literate, skilled in the processes of science, acquire scientific information in depth, cultivate an appreciation for science and develops Scientific Interest"'

There is a shift in emphasis from the teaching of science content to that of helping students develop competence in the science in the science processes. Science processes are intellectual skills used in collecting and analyzing data to solve problems. In all modern educational systems, science education is given through actual scientific activities-experimentation and organization of the first hand knowledge obtained through experimentation. This will help the learner to develop Scientific Interest.

The call for placing science processes and scientific interest in the central position of science education began with Dewey's teaching on the utility value of education in 1920's. It geared momentum in 1960's. Beginning from 1960 numerous curriculum innovations have laid stress on scientific procedures and on the development of scientific attitudes and scientific Interest. Some of these innovations emphasize the scientific processes at the expense of product and others advocate the teaching of products through processes. Today with the emerging trends in science education, processes are given more stress, curricula are framed and text book are rewritten with a view to develop science process skills. But the extent to which teaching and learning is effective in imparting training in the development of skills and acquisition of knowledge is in question. This effectiveness depends on individual variable belongs to the cognitive and affective domain, social variables and variables related to the immediate environment of the learner. Development of Scientific Interest is one of the major objectives of Science Education.

Theoretical Background of Scientific Interest

According to Douglas Fryer (1931) "Interests are the objects and activities that stimulate pleasant feeling in the individual." Interests are the significant in so far as they relates to the needs. For eg. when a student needs something, his interest would reflect that need. Interests are known to function as motives in a particular activity and the speed with which that activity is learned. Obviously, a high level of interests means a high level of learning.

Studies show that as children grow, their interests in science tend to decline (Osborne, 2003). Especially, science textbooks include many theories, which are difficult for some students to comprehend. It is boring for a student to study science topics without interest. For achieving these ends, there should be many efforts in various fields, such as curriculum, instruction, assessment and so on.

Dewey's View of Scientific Interest

Interest means activity in which self and objects are unified under clear ends. Dewey (1913) clarifies interest using various terms. The core of his view of interest are three things. The first one is "Interest means unified activity" (Dewey, 1913). The second one is Interest is a

state that a man is totally engaged until accomplishing his ends. Finally, Interest has intellectual property. When curiosity becomes intellectual, it is transmuted into interest in a degree in finding out for oneself the answers to questions (Dewey, 1933). A man having scientific interest clearly perceives the result of an activity, and pursuits for means. 'Genuine and intellectual interest' inspires students to think about science topics reflectively and develops scientific interest.

Motivation Theories' Views of Scientific Interest

Motivation theories have regarded interest as one factor of motives from 1940s. A form of interest is explained in a different way depended on its background motivation theory such as extrinsic motivation theories and intrinsic motivation theories. To extrinsic motivation theorists, exclusively reinforcement theorists, interest is from one's need or wants. A child has been reinforced for a definite behavior and his interest is in rewards. To intrinsic motivation theorists, motivation comprises performing an activity for its own sake rather than as a means to an end (Hidi, 2000).

Interest Theories' Views of Scientific Interest

Kintsch(1980) defines two forms of interest that occur during reading; emotional and cognitive interest. Emotional interest is the sentimental response that readers have in text such as when they are particularly moved by character's actions. Cognitive interest results when the text captures the reader's mind and thought. Teacher should be careful when applies the concept of emotional interest in the classroom with materials. The strong point of interest theories is to give some directions how to catch interest in a science classroom.

A constructivist classroom ensures the scientific interest in students. Students having scientific interest show the following specifications.

♦ Puts questions in scientific discussions

♦ Reads scientific literature and biographies of scientists

♦ Takes scientific hobbies

♦ akes part in scientific debates and discussions

♦ Visits places of scientific interest

♦ Organizes or actively participates in science club activities

♦ Contributes article on scientific interest

♦ Observes and studies natural and manmade surroundings

♦ Prepares display materials related to scientific events

Constructivist learning environment helps students to develop Scientific Interest and the Scientific Interest can be assessed using Scientific Interest Inventories. Scientific Inquiry starts with something catches our interest and we take time to observe it. Scientific interest helps the students to minimize their level of learning difficulty in science. The measurement of one's interest in a related field may help to predict the future of the individual. Scientific Interest is an essential component for developing Science Process Skills. Developing the individual having great temperament and Interest in Science will contribute to the progress and prosperity of Nation. Scientific Interest is one of the important factors for learning Science because:

♦ Our interests are very much linked with our wants, motives, drives and basic needs.

♦ Interest is a great motivating force that persuades an individual to engage in a cognitive, psychomotor and affective behavior.

♦ Interest is the mother of attention. Attention always implies the activity, what we have in our mental structure.

Constructivist learning environment fosters the Scientific Interest in students through different learning activities. The main aim of Science education is to create natural curiosity and interest among the children and they seem to be scientist at heart. Scientific Interest is a positive feeling towards science and complete absorption in scientific inquiry. There is a need for excellent constructivist methods of teaching in developing scientific interest in students.

Need and Significance of the Study

A genuine interest in science is not only an obvious prerequisite for a career as a scientist, but also necessary components of scientific literacy. Given the importance of scientific interest, it is disconcerting that many researchers have observed the problem of students becoming uninterested in and unmotivated to learn science at a young age. This phenomenon is particularly pronounced in the school context, where students who hold a positive view of the role of science in society express negative feeling about science in schools. With much evidence supporting the positive impact of interest on a variety of learning outcomes, it is reasonable to suggest that the lack of interest among young students not only threatens the production of the next generation scientists, but more importantly, impedes students from becoming scientifically literate citizens, as they unlikely or even unable to engage with important science related social issues.

Objectives

1. To study the distribution of the scores on Scientific Interest among the Students of Standard Nine.

2. To find out the level of Scientific Interest among Students of Standard Nine.

3. To find out the significance difference if any between the Means of the scores on Scientific Interest among,

   a. Boys and Girls of Standard Nine of Kottayam district.

   b. English medium and Malayalam Students of Standard Nine of Kottayam district.

4. To find out the mean scores of Scientific Interest.

Hypotheses

1. The distribution of Scientific Interest of Students of Standard Nine is approximately equal.

2. There is no significant difference in the Means of the scores on Scientific Interest among boys and girls and that of English medium and Malayalam medium students of standard nine of Kottayam district.

Methodology

Normative survey method was adopted for the present study. The sample consists of 80 students of standard nine, randomly selected out of the total population in Kottayam District. While selecting the sample due representation was given to gender and medium of instruction. Investigator used the standardized tool of Science Interest Inventory prepared by (Joseph & Suresh, 1998). The Science Interest Inventory consists of 25 items. For each item 'one' score was given, if a subject selects an activity which shows some inclination towards the learning of

science and a 'zero' score for selecting alternatives. Thus a respondent could get a maximum of 25 scores in this inventory. The inventory has high validity and reliability. The reliability coefficient of Science Interest Inventory was found to be 0.94 and validity coefficient was 0.72.

The Science Interest Inventory was administered to selected sample. The students were given necessary instructions before allowing them to respond to the items. The scoring procedure was done according to the scoring key. The collected data was systematically classified and tabulated according to the formulated hypotheses.

Statistical Technique

The following statistical techniques were employed for the analysis of data collected.

1. Mean

2. Standard deviation and 't' –test

Analysis and Interpretation

The scores obtained by the students were tabulated and consolidated in to afrequency table as given below.

Table 1

Distribution of the scores of scientific interest among Students of Standard Nine

Class interval	Frequency	Percentage
1-5	9	11.25
6-10	12	15.00
11-15	30	37.50
16-20	15	18.75
21-25	14	17.50
Total	80	100

The first objective was to find out the distribution of Integrated Science Process Skills among the students of standard nine. From the table values it is interpreted that highest number of students (37.50%) fall in the class interval of 11-15. While 11.25% belongs to the class 0-5 and about 15% got marks in between 6-10 it is seen that 18.75% got scores between 16-20. Only 17.50% got scores in the class interval 21-25. This shows that the scores are not normally distributed around the central score.

The second objective was to find out the level of Scientific Interest among students of standard nine. For this the investigator classified the whole sample based on the scores obtained for the Science Interest Inventory. Using the mean and standard deviation of the scores the students were classified as High Scientific Interest, Moderate Scientific Interest and Low Scientific Interest. The number and percentage of students come under each of these groups are given in table 2

Table 2

Classification of total sample of students based on their Scientific Interest.

Level of Scientific Interest	Range	No. of Students	Percentage
High Scientific Interest	>21.13	15	18.75
Moderate Scientific Interest	Between 21.13 and 13.12	44	55.00
Low Scientific Interest	<13.12	21	26.25
Total		80	100

Table 2 shows that majority (55.00%) of students have moderate Scientific Interest. Only 18.75% of students have high Scientific Interest. About 26.25 % of students have low Scientific Interest.

The third objective was to find out the significance of difference in Scientific Interest among Students of standard nine based on Gender and Medium of instruction. The investigator used inferential statistics to find out the significance of difference between the mean scores of the variables. The t-values calculated are presented in table 3 and table 4.

Table 3
Scientific Interest among Students of Standard Nine with respect to gender

Variable	Category	N	Mean	S.D	df	t-value	Remarks
Scientific Interest	Boys	40	20.6604	4.765	106	0.293	Not significant at 0.05 level
	Girls	40	20.2857	4.574			

It is clear from the table 3 that the t-value is less than the table value 1.96 at 0.05 level of significance. It shows that there is no significant difference in Scientific Interest between boys and girls of standard nine. The hypothesis formulated is accepted. The mean scores on Scientific Interest among boys and girls are more over same.

Table 4
Scientific Interest among Students of Standard Nine with respect to medium of instruction

Variable	Category	N	Mean	S.D	df	t-value	Remarks
Scientific Interest	English	41	26.28	5.286	103	0.321	Not significant at 0.05 level
	Malayalam	39	26.62	5.313			

Table 4 shows that the t-value is less than the table value 1.96 at 0.05 level of significance. It shows that the mean scores on the process skills among English medium and Malayalam medium students of standard nine not differs significantly. The hypothesis formulated is accepted. So the investigator concludes that there is no significant difference between English medium and Malayalam medium students of standard nine in the Scientific Interest.

Major Findings of the Study

1. The distribution of Scientific Interest among students is not normally distributed.

2. Majority of the students have moderate Scientific Interest.

3. There is no significant difference in Integrated Scientific Interest among Boys and Girls.

4. There is no significant difference in Scientific Interest among English medium and Malayalam medium students.

Conclusion

The decline of scientific interest in secondary school suggests that the schools were not much helpful for students in terms of stimulating their interest in science. The purpose of learning science is not only to learn contents of science but also to have good attitude towards science such as having interest or aesthetic appreciation of science. Therefore, there is a need for research about how to bring good attitudes towards science in school as well as how to create student's scientific interest in class room.

Many studies show that classroom environment has a significant influence on students' interest in science. Myers and Fouts (1992) found that the most positive attitudes were associated with a high level of involvement and personal support, strong relationships with classmate and use of a variety of teaching strategies and unusual learning activities(quoted from Osborne). Haussler & Hoffman (1992) indicates that the best predictor of students' interest in Science is the self-concept, which depends on favourable learning environment.

Especially there is much evidence that the quality of the teaching is a significant determinant of attitude and interest to school science. Hendley et al (1995) found that one of the most frequently given reason for liking or disliking the subject was a teacher-related comment. Tobias (1990) also shows that many college students attributed their uninterested attitude towards science to the uninteresting lecture such as focused on problem-solving technique and lacked an intellectual overview of the subject (Osborne, 2003). Therefore, there is a need for good teaching method to increase student's interest and engagement.

A genuine interest in science is an important part of scientific literacy, and thus a critical goal for science education. Recent studies, however, have found that the school science has not been effective in meeting this goal, an important reason for which is lack of knowledge about what makes science interesting to students. Activities that were " Hands-on" in nature and allowed for engagement with technology elicited higher interest. There is a need to place more emphasis on the role of activity in constructing interesting learning environments, and in the mean time, suggests that students' Science Interest could be improved by making changes to relatively easy- to-manipulate aspects of learning environments.

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Effectiveness of Experiential Learning Model on Achievement in Mathematics

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Abstract

Education works best when concentrates on thinking and understanding rather than on rote memorization. The new generation students are highly active and they have the ability to absorb information rapidly. They do not like learning through lecture method. They like to learn by touching, feeling, moving and experiencing. So implementation of new models of teaching which enables them to learn by engaging in activities will be desirable. In Experiential learning students are allowed to engage in their own experiences and reflect up on those experiences to further synthesis and analyze information. In the present study an attempt was made to find out the Effectiveness of Experiential Learning Model on Achievement in Mathematics among eighth standard students. The study was conducted adopting quasi-experimental method with pre-test post-test non-equivalent group design. The sample consisted of 76 students of 2 divisions in standard eight with 36 students in each class. Classes in Mathematics using instructional material developed by the investigator were taken in experimental group. In the control group class based on prevailing method were taken. The study showed that Experiential learning model is effective on Achievement in Mathematics among eighth standard students. It was also revealed that the instructional material for Mathematics based on Experiential learning model is effective for both boys and girls.

Key words : Experiential learning, Individual difference, New generation students, Academic output etc.

Introduction

Education is not filling a vessel but lighting a fire. It is the light meant for enlightening the world. Education is a process which draws out the best in man with the aim of producing a well-balanced personality-culturally refined, emotionally stable, ethically sound, logically correct, mentally alert, intellectually competent, technically advanced, morally upright, physically strong, socially efficient, spiritually mature, vocationally self sufficient and internationally liberal.

Education, the foremost weapon for social reforms, is now under the force of change. Newly formed branches of knowledge and the techniques of education facilitate the physical, mental and emotional development of the learners. Schools have an unavoidable role in acquainting the students with the nature of changing field of education and in making

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necessary changes in the instructional techniques. In the modern world of technological innovations, all educational institutions are trying to improve their quality in terms of facilities and academic outputs.

One of the most crucial problems of education is individual differences. Each classroom consists of students having individual differences with regard to various abilities, background characteristics, personality traits etc. Classroom observations also tell us that the students differ in various aspects such as their reaction times, amount of encouragement they need to attack a learning task and in the ways in which they deal with a given task.

Universally, Mathematics is taught as one of the subjects in schools, colleges and universities. Mathematics is considered as "the queen of all science". However it is unfortunate to note that Mathematics in general, is disliked by many of the students and is not taught effectively by all teachers. No lesson can be effective unless there is effective pupil participation in it. In order to enable the learners to participate in the instructional process, there is an imperative need to adopt some kind of learner centered new approaches in the classroom.

Need and Significance of the Study

In the present educational system both the teachers and students face a lot of problems. The new generation students are highly active and have the ability to absorb information rapidly. They do not like lecture method. It causes some mental stress among the pupil because they are interested in learning through activities.

Experiential learning strategy leads individuals to generate understanding and transfer knowledge in a manner different from the traditional didactic method of teaching. Experiential learning allows students to engage in their own experiences and reflect up on those experiences to further synthesis and analyze information.

Our lives consist of many trivial and significant experiences daily. For these experiences to become learning, or for change to occur in awareness and behaviors, selected experiences are to singled out, reflected and acted upon. The Experiential learning model is valuable and it has been shown effective to improve motivation for learning.

The present study investigates the effectiveness of Experiential learning model on Achievement in Mathematics

Statement of the Problem

The present study is entitled as **Effectiveness of Experiential Learning Model on Achievement in Mathematics**

Operational definitions of the terms are given below.

Experiential Learning.

Experiential learning is a learning process whereby knowledge is created through the transformation of experiences. Here knowledge is constructed through the combination of grasping and transforming experiences.

According to David A Kolb, Experiential learning can be implemented in the classroom by four steps. They are Concrete experience (feeling), Reflective observation (watching), Abstract conceptualization (thinking) and Active experimentation (doing).

Achievement in Mathematics

Achievement in Mathematics is considered as the total score obtained by an individual in the achievement test conducted by the investigator in Mathematics.

Effectiveness

It means use of a plan for instruction or presentation which causes desired changes in the learners behavior. In the present study the desirable change in behavior is to be found in their Achievement in Mathematics.

Objectives of the Study

♦ To find out the effectiveness of Experiential learning model on Achievement in Mathematics among students of standard eight

♦ To find out the effectiveness of Experiential learning model on Achievement in Mathematics among girls of standard eight.

♦ To find out the effectiveness of Experiential learning model on Achievement in Mathematics among boys of standard eight.

♦ To find out whether there is any significant difference between boys and girls of experimental group on Achievement in Mathematics.

♦ To find out whether there is any significant difference between boys and girls of control group on Achievement in Mathematics.

Hypotheses of the Study

♦ The gain score of experimental group is significantly higher than that of control group.

♦ The gain score of girls of experimental group is significantly higher than that of control group.

♦ The gain score of boys of experimental group is significantly higher than that of control group.

♦ There is significant difference between boys and girls of experimental group on the means scores of post-test.

♦ There is significant difference between boys and girls of control group on the means scores of post-test.

Variables Involved in the Study

Experiential Learning model and the Achievement in Mathematics were taken as the independent variable and dependent variables respectively.

Population and Sample of the Study

The population of the present study was all the eighth standard students of Ernakulum district who follow Kerala state syllabus. From the population the investigator selected 72 pupils of a school as the sample.

Tools Used for the Study

♦ Pre achievement test prepared by the investigators.

♦ Lesson transcripts based on experiential learning model prepared by the investigators for the experimental group.

♦ Lesson transcripts based on prevailing method prepared by the investigators for the control group.

♦ Post achievement test prepared by the investigators.

Statistical Techniques Used

Mean, standard deviation, t-test and ANCOVA were used for analyzing the data.

Methodology in Brief

The investigator conducted the study by adopting quasi - experimental method with pre-test post-test non-equivalent group design. In the experimental group teaching of Mathematics was done by the investigator using the lesson transcripts prepared based on experiential learning model and in the control group teaching was done using the lesson transcripts prepared based on the prevailing method.

Analysis and Discussion

The first objective of the study was to find the effectiveness of Experiential learning model on the Achievement in Mathematics among eighth standard students. For this, using pre-test and post-test scores of both the groups, the gain scores were computed. Then the t-value was calculated. It is presented in table 1.

Table 1.

Means, standard deviation and t-value of gain scores of experimental group and control group

Group	N	M	SD	t value	Result
Experimental Group	36	11.36	3.36	3.72	significant at level 0.01
Control Group	36	7.56	3.01		

From table 1 it is observed that the obtained t-value 3.72 is higher than the theoretical value 2.38 set at 0.01 level. Hence the difference in gain scores is significant. As the mean of gain scores of Experimental group is higher than that of the control group it is clear that the instruction based on experiential learning model was very effective on Achievement in Mathematics.

To find out the effect of experiential learning model on the Achievement in Mathematics among boys of eighth standard, the t-value between means of gain scores of boys of experimental and control groups were calculated. It is given in table 2.

Table 2

Mean, standard deviation and t-value of gain scores of boys of experimental group and control group

Group	N	M	SD	t value	Result
Experimental group	24	11.54	3.77	4.03	Significant at level 0.01
Control group	24	7.58	2.99		

From table 2 it is observed that the obtained t-value 4.03 is higher than the theoretical value 2.41 set at 0.01 level. It means that the gain score of boys experimental group is significantly higher than that of control group.

The third objective of the study was to find out the effectiveness of Experiential learning model on the Achievement in Mathematics among girls of eighth standard students. The mean, standard deviation and t-value were calculated using the gain scores of girls of experimental group and control group. Its details are given in table 3.

Table 3.

Mean, standard deviation and t-value of gain scores of girls of experimental group and control group

Group	N	M	SD	t value	Result
Experimental group	12	11	2.58	3.01	Significant at level 0.01
Control group	12	7.25	3.22		

From table 3 it is observed that the obtained t-value 3.01 is higher than the theoretical value 2.51 set at 0.01 level. It shows that the gain scores of girls of experimental group is significantly higher than that of control group.

The fourth objective of the study was to find out whether there is any significant difference between boys and girls of experimental group on Achievement in Mathematics. Significance of difference was found out using t-value and it is given in table 4.

Table 4

Mean, standard deviation and t-value of gain scores of boys and girls of experimental group.

Experimental group	N	M	SD	t value	Result
Boys	24	19.38	3.89	0.743	Not significant at level 0.01
Girls	12	19	2.23		

From table 4 it is observed that the obtained t-value 0.743 is lower than the theoretical value 2.72 set at 0.01 level. It means that there is no significant difference between boys and girls of experimental group on Achievement in Mathematics.

To find out whether there is any significant difference between boys and girls of control group on Achievement in Mathematics, t-value was calculated and it is presented in table 5.

Table 5.

Mean, standard deviation and t-value of gain scores of boys and girls of control group.

Control Group	N	M	SD	t value	Result
Boys	24	13.96	3.05	1.08	Not significant at level 0.01
Girls	12	15.33	3.8		

From table 5 it is observed that the obtained t-value 1.08 is lower than the theoretical value 2.72 set at 0.01 level. It shows that there is no significant difference between boys and girls of control group on Achievement in Mathematics.

Major Findings of the Study

The following are the major findings of the study.

- Experiential learning model is effective on Achievement in Mathematics among eighth standard students.

- The instructional material for Mathematics based on Experiential learning model is effective on Achievement in Mathematics in the case of girls of standard eight.

- The instructional material for Mathematics based on Experiential learning model is effective on Achievement in Mathematics in the case of boys of standard eight.

- Experiential learning model in Mathematics has no special effect on gender.

- Prevailing instructional method in Mathematics has no special effect on gender.

Educational Implications of the Study

1. The findings of the study imply that Experiential learning model is more effective over the prevailing method of teaching in enhancing the Mathematics Achievement among the students. If schools follow this model, learning of mathematics become more meaningful and easy. It also maintain good working relationship with teacher and students.

2. As Experiential learning model promotes interest and curiosity in students, teachers should train themselves to handle this model.

3. Through this model teachers should help the students to express their ideas freely in the class rooms.

Conclusion

The present study proved that Experiential learning model based on experiential learning theory is effective for enhancing the Achievement of students in Mathematics. The investigator has examined the effect of instructional material prepared based on experiential learning model on Achievement in Mathematics among eight standard students. It was concluded that instructional material based on experiential learning model is more interesting and innovative when compared to prevailing method. So the investigator hopes that, on the light of the results of the study teachers will make use of experiential learning model in the teaching learning process. It is also expected that in the inservice teacher education programmes due weightage will be given for introducing and practicing Experiential learning model.

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Self Concept and Anxiety among NSS and Non NSS Higher Secondary Students

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Abstract

The study of human behaviour is incomplete without its affective aspects, feelings and emotions. Anxiety and self-concept are the psycho dynamic factors of human behaviour. The study of these factors has been the subject of immense interest for many psychologists through several years. The objective of the present study is to find out relation between Self-concept and Anxiety of NSS and Non NSS students at higher secondary level. The data is collected by conducting a survey on 200 higher secondary studentsof which100 are NSS volunteers and 100 are Non NSS students.Standardised tools,namely Taylor's Manifest Anxiety Inventory and Self-concept Inventory by MukthaRastogi are used for data collection.Test of Significance of the difference between Mean and Karl Pearson's Product Moment Coefficient of Correlation are used for analysis.The study reveals a high relationship between Self Concept and Anxiety among students in NSS compared to non NSS students.It also shows that NSS students have high Self Concept and less Anxiety than Non NSS students. The study highlights the effectiveness of NSS programme in developing Self Concept and reducing Anxiety among Higher Secondary Students.

***Key Words** : National Service Scheme, Self Concept, Anxiety, Higher Secondary Students etc.*

Introduction

National Service Scheme (NSS) is an Indian Government-sponsored public service programme conducted by the Ministry of Youth Affairs and Sports of the Government of India. Popularly known as NSS, the scheme was launched in Gandhiji's birth centenary year, 1969. The Education Commission headed by Dr. D.S. Kothari (1964-66) recommended that students at all stages of education should be associated with some form of social service. This was taken into account by the State Education Ministers during their conference in April 1967 and they recommended that students could be permitted to join the National Cadet Corps (NCC) which was already in existence on a voluntary basis and an alternative to this could be offered to them in the form of a new programme called the National Service Scheme (NSS). The main objectives of NSS are to understand the community , identify the needs and problems of the community, develop among themselves a sense of social and civic responsibility, develop competence required for group-living and sharing of responsibilities, acquire leadership qualities, democratic attitudes etc. The NSS programme is introduced in schools and colleges to equip the students

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with qualities required for personality development and to prepare them for social service.

The three aspects of self are perceived self, ideal self and real self. The perceived self is "what we think we are", the ideal self is "what we would like to be", and the real self is "what actually we are". It is the subjective feeling of the self that stands at the centre of the personality. The building of the Self Concept is a slow process, growing out of reaction of parents and others to the child's early behaviour. NSS programs help them to develop self-concept.

Anxiety of higher secondary school students adversely affect their studies. A student with a balanced personality can make success in life. Self Concept designate goal seeking behaviour where behaviour operates under cognitive influence, while anxiety is considered to be the effective aspect of behaviour. NSS programs help to develop these factors in adolescents. It is necessary to investigate the influence of these potent factors of human behaviour in adolescents. The students who had high self-esteem were significantly less anxious than those with low self-esteem. A high level of Self-Concept helps the students in the task of learning.

Need and Significance of the Study

The study of Self-concept and Anxiety has been of observing interest to psychologists, sociologists and educationists all over the world. The study of Self-concept and Anxiety among Higher Secondary school students is of considerable interest to educationalists. Sometimes students seem to perform below or above the level commensurate with their ability

conditions in home and the emotional difficulties may be the reason for their under achievement. Individual's Self-Concept is of great importance for mental health, and it can be said that an individual has mental health if he/she has a positive Self-Concept. Recognition of factors affecting mental and physical health of persons, especially students, is of special importance.

A healthy Self Concept is more than having high self-esteem. While high self-esteem is important, the term itself can be misleading since self-esteem is largely based on our 'feelings' of self-worth and encompasses our 'beliefs' about being valuable and capable. It consists of our self-image, either positive or negative, at an emotional level. When based on emotion, self-esteem can be wavering and vulnerable to threats. Likewise, it is obtained mostly from external factors, such as an attractive physical appearance, or being popular. Therefore, a healthy Self-Concept must derive from within. Instead of being dependent upon validation from external sources, or the wavering opinions of others, self-esteem must result from self-reflection, self-analysis and self-acceptance.

Anxiety is an inevitable experience in everyday life, and a certain level of Anxiety is normal. This Anxiety may be expressed through increasing levels of generalized anxiety, anxiety attacks, panic attacks, the development of phobias, or obsessive thoughts or compulsive behaviours. Everyone has feelings of Anxiety at some point in their life, whether it is about preparing for a job interview, meeting a partner's family for the first time, or the prospect of parenthood. While we associate Anxiety with alterations to our mental state, experienced as worry or apprehension perhaps, and physical

symptoms such as raised heart rate and adrenaline, we also understand that it is likely to affect us only temporarily until the source of our Anxiety has passed or we have learnt to cope with it. Anxiety is therefore one of a range of emotions that serves the positive function of alerting us to things we might need to worry about things that are potentially harmful. More importantly, these emotions help us to evaluate potential threats and respond to them in an appropriate way, perhaps by quickening our reflexes or focusing our attention. In this regard Self-Concept and Anxiety are highly related .This paper examines how the Self-Concept and Anxiety are related among NSS and Non NSS Higher Secondary School Students.

Definition of the Terms

Self-Concept

Self-Concept is a person's total appraisal of his appearance, background and origins, abilities and resources, attitudes and feelings, which act as a directing force in behaviour.

Anxiety

Anxiety is the behavioural and psychological responses directly caused by a situation, an appraisal of the responses and effects.

National Service Scheme(NSS)

National Service Scheme popularly known as NSS is a college and higher secondary based voluntary youth organization under the Youth and Sports Affairs, Ministry of India.

Objectives of the Study

1. To find out the relationship between Self-Concept and Anxiety among NSS and Non NSS Higher Secondary Students

2. To find out the significance of difference, in the Self-Concept and Anxiety among NSS and Non NSS Higher Secondary Students.

Hypotheses of the Study

1. There is significant relationship between Self-Concept and Anxiety among NSS and Non NSS Higher Secondary Students.

2. There is significant difference in Self-Concept and Anxiety among NSS and Non NSS Higher Secondary Students.

Methodology

The main purpose of the present study is to find out the relation between Self-Concept and Anxiety among NSS and Non NSS Higher Secondary Students. For this the investigator conducted a survey on 200 Higher Secondary School students. Of this 100 are NSS volunteers and 100 are Non NSS students. To measure the variables, the investigator used 2 tools, namely Self-concept Inventory by Muktha Rastogi and Taylor's Manifest Anxiety Inventory.Statistical techniques used were t-test and Karl Pearson's Product Moment Coefficient of Correlation. Inorder to test the significance of the difference between Means t-test wsa used and Karl Pearson's Product Moment Coefficient of Correlation are used for finding the relationship between the two variables.

Analysis and Interpretation

Relationship between Self-Concept and Anxiety among NSS and Non NSS Students

The correlation betweenSelf-Concept and Anxiety among NSS and Non NSS Higher Secondary Students were calculated and is presented in table 1.

Table 1

Results of correlation between Self Concept and Anxiety among NSS and Non NSS Higher Secondary Students

Group of Students	No.	r-Value	Table Value	Significance
NSS	100	-0.53	0.148	0.05 Level
Non NSS	100	-0.33		

Table 1 shows that the obtained r- value between Self Concept and Anxiety of the NSS students is -0.53 which is significant at 0.05 level. There is substantial negative correlation between Self Concept and Anxiety that means when the Self Concept of the students increases, the Anxiety decreases. So it can be concluded that NSS will help the students to increase their Self Concept and it will reduce their Anxiety. But in the case of Non NSS students the correlation between the Self Concept and Anxiety is -0.33 which indicates that there is low correlation between Self Concept and Anxiety. That means there exists low negative relation between Self Concept and Anxiety among Non NSS Higher Secondary Students.

Difference in Self Concept and Anxiety among NSS and Non NSS Students

The difference in the mean scores of both the variables, Self Concept and Anxiety, among NSS and Non NSS Higher Secondary Students were found out and is given in table 2.

Table 2

Data and results of test of significance of the difference between means of scores on Self Concept and Anxiety among NSS and Non NSS Higher Secondary Students

Variables	Group of Students	No.	Mean	S.D	t-Value	Significance
Self Concept	NSS	100	126.32	3.18	2.88	0.05 Level
	Non NSS	100	125.3	3.12		
Anxiety	NSS	100	9.21	2.18	6.84	0.05 Level
	Non NSS	100	11.23	1.99		

Above table shows that the obtained t-value for Self Concept among NSS and Non NSS students is 2.88 , which is significant at 0.05 level. That means there is a significant difference in the Self Concept level of NSS and Non NSS students. The obtained mean score of NSS students is 126.32 is greater than the mean score of Non NSS students.So it can be concluded that NSS students have high Self Concept compared to Non NSS students.

The obtained t- value for Anxiety among NSS and Non NSS students is 6.84, which is significant at 0.05 level. It means that there is

a significant difference in the Anxiety level of NSS and Non NSS students. The obtained mean score of Anxiety of Non NSS students is 11.23 which is greater than the mean score NSS students.So it can be concluded that NSS Higher Secondary Students have low Anxiety compared to Non NSS Higher Secondary Students.

Conclusion

The study reveals that there is negative relationship between Self Concept and Anxiety among NSS and Non NSS Higher Secondary Students. That means NSS will help the students to improve the Self-Concept that will help them to reduce the Anxiety level. More over the NSS students have high Self Concept compared to Non NSS students. In the case of Anxiety, NSS students have Low Anxiety compared to Non NSS students. The overall aim of National Service Scheme as envisaged earlier, is to give an extension dimension to the higher education system and orient the student youth to community service while they are studying in educational institutions. The educated youth who are expected to take the reins of administration in future are found to be unaware of the problems of the community and in certain cases are indifferent towards the needs and problems of the community. Therefore it is necessary to arouse the social conscience of the students, and to provide them an opportunity to work with the people in the villages and slums. It is felt that their interaction with the common villagers and slum- dwellers will expose them to the realities of life, and bring about a change in their social perception.

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Preventive System- An Educational Method that Demands from the Educator, but Soothing for the Educand

Josekutty Thomas

Abstract

Preventive System is a method of education that was promulgated by St. John Bosco who is commonly known as Don Bosco. In his autobiography Memoirs of the Oratory of Saint Francis de Sales from 1815 to 1855 written, at the insistence of Pope Pius IX he explains the basics of this method of education. This method which is completely opposite to the repressive method of Education was not completely his invention. But he lived this method all his life and looked after and educated many youth during his life time. Preventive System of education is based on mainly on the idea that tendency to evil exists in all human beings. This tendency exists at various degrees in various individuals. In this method it is the duty of the educator to protect the young from all moral evils than to punish them for after being affected by them. No corporal punishments, loving kindness, reasoning, loving relation with God are salient features of Preventive System of Education.

***Key Words** : Repressive method, Preventive method, Expressive method, Corporal punishment, Loving kindness etc.*

A Brief Life Sketch of John Bosco

St. John Bosco commonly known as Don Bosco was born on 16 August 1815 at Becchi, in Piedmont, Italy. With the loss of his father at the age of two, he had a tough time as he grew up, with his step brother. The greatness of him consists in the fact that he learned from his bitter and tough life experiences and made it a positive upbeat for his life. His mother Margarete supported him in his endeavor to study. He struggled hard to pay for his schooling. Part time jobs that he did at a bakery, with a cobbler and with other experts of various trades made him a connoisseur of many trades. Later in his life, he made use of these knowledge to impart technical education to the young at risk. He decided to become a catholic priest and joined the seminary at Turin, Italy. He was ordained a priest on 5th June 1841.

During his life as a priest of the diocese of Turin, he took care of the orphans and the poor boys of the streets of Turin who came to the town to look for work in the factories that had come up during the industrial revolution. He taught them various trades and got jobs for them. His mother and some of his friends joined him in his noble task. To continue his work, he began a society named 'Society of St. Francis de Sales', along with his pupils. They imbibed his spirit living with him and learned from their life experience with him. At

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one time he had more than eight hundred students in his home for the boys which he called, 'Oratory'. Later along with a young lady, Mary Mazarello he extended his work to the poor girls or Turin. After more than thirty years of his successful work among the boys he defined his method of education as 'Preventive System of Education'. He writes about this in his autobiography. He died on 31 January 1878. He was given the title 'father and teacher of youth' by Pope John Paul II. Today his work extends to more than a hundred and thirty countries of the world with more than fifteen thousand '*Salesians'* and seventeen thousand '*Daughters of Mary Help of Christians*' working for the all-round development of the young boys and girls. Don Bosco's uniqueness lay in his ability to involve all people of goodwill around a common project. Besides the founding of Salesian Society and *Daughters of Mary Help of Christians*, he set up a world-wide family of co-operators past pupils and lay volunteers. His benefactors included businessmen, government officials and even the Pope. He spent his whole life involving others for the benefit of poor and abandoned youth.

The Three Methods of Educating the Young

Broadly speaking one find three methods of educating the young; the Repressive, the Preventive and the Expressive method of education. Each of this method is a specific way of learning or making the child learn in a particular way.

The Repressive Method of Education

It is an ancient method based on suppression of a learner by putting in a lot of restraint on his activities by the educator. It is a method of subjugation used by the teacher over its pupil. Here the teacher's approach towards his/her pupil is highly authoritarian. It is based on the negative analysis of a human being that all persons are imperfect and should be moulded through punishment. Fear of the teacher and punishment plays an important role in this method of education. The teacher is expected to make known all the rules to the pupil and is allowed to punish those who disobey those rules. It treats a human being like a machine as the function of a pupil is understood in a mechanistic term. There is very little place for love in this system. The love of the teacher is shown in punishing the wrong doers. It does not entertain any difference of opinion. The opinion of the teacher has to be the opinion of the students. The teacher should keep a distance from the students. Their strength is their absence and their inapproachability. "The repressive system is centered more on the goal to be achieved. It looks at the young person as if it is looking at the future adult who, as a consequence, should be treated like an adult from the early years. The end results are severe and demanding domestic patterns, schools with a stricter regime of discipline, relationships and measures loaded with responsibility, military-style academies and the like." (Braido, 2013)

The Preventive Method of Education

Preventive method of education developed in the early nineteenth century in Italy and France. It was a method used to deal with the juvenile delinquents in correction homes. It was based mainly on the idea that tendency to evil exists in all human beings. This tendency exists at various degrees in various individuals. So the young people who are most vulnerable to these evil tendencies must be protected. In this method it is the

duty of the educator to protect the young from all moral evils than to punish them for after being affected by them. This method developed a system in which the educator makes effort to keep the students away from wrong doings so as not to punish them for breaking the law. It is based on love and care that one receives from one's loving parents. This safeguards the child from falling into crimes through the respect and familiar approach of the educator.

The Expressive Method of Education

This method of education has its roots in the thoughts of the educational philosopher Jean Jacques Rousseau. This type of education is complementary to the preventive method of education. The educator foresees the harm that is going to come on the pupil in view of the complete growth of the young person. The expressive method provides a wide variety of opportunities for maturation. Experiential learning, talent-nurturing, skill-development, training for livelihoods – all these possibilities are made available in order to create the positive reinforcement needed for a healthy self- esteem and citizenship. The entire pedagogical experience is based on cooperation with one's peers.

Don Bosco's Way: A Blend of Preventive and Expressive Systems of Education

Don Bosco was impressed by the Preventive method of education. He even called his educational experience the 'Preventive System'. In doing so, he borrowed a title from the novel method of education that had been accepted by the more humanistic educational institutions of his time. He chose, thereby, a modern approach of education through loving persuasion, than the medieval method of repression.

Don Bosco promoted the preventive method of education as he was completely against the repressive method used during his time to control the young delinquents. The experiences that he gathered as a fatherless child from the age of two, his mother's loving corrections and his experiences in dealing with the young for a long time made him convince the need to follow the path of prevention rather than repression. He wrote in January 1883 a letter to the directors of his institutions of that time that the young people "benefit rather than suffer when they are objects of disciplinary action". He insisted on 'kindly persuasion" than "coercive measures"

Don Bosco preferred the preventive method of education as he envisaged in it the only hope to stop juvenile delinquency and a universally accepted form of child exploitation of his time. "[The] preventive system is more centered on the child, on the limitations of his or her age, and therefore calls for a constant and loving assistance by the educator or teacher, who like a father or like a mother is there present, gives advice, guidance and lends support. The end results are family-oriented educational patterns." (Braido, 2013)

Don Bosco envisaged a method of preventive system that can be applied through the Expressive method of education. He had an enthusiastic and energetic personality. He was very talented and endowed with concoction of qualities of head and heart. These expressive characteristics of his life and his talents became part of his educative methodology. The amalgamation of these two systems helped him to protect the young from the evil influences of the society at that time and to motivate them positively to bring out the best in them.

For Don Bosco, preventing young people from physical or moral erroneous actions were essentially linked to training them for self-expression through creative activity.

The expressive method helped the adolescents to believe in themselves. The presence of the educator and his encouragement made him/her feel valued, cared for and loved. Through this, the educator is able to build up a strong self-esteem in the young. Don Bosco used games, music, picnics, group activities, excursions, dramatics, professional training etc. to achieve this purpose. He used to say, "Let the boys have full liberty to jump, run and make as much noise as they please. Gymnastics, music, theatricals and outings are most efficacious means of obtaining discipline and of benefiting spiritual and bodily health." In all these activities Don Bosco foresaw the forming of the character of the youngster. The professional trainings along with these extracurricular activities helped them to stand on their own feet in the great struggle of life.

It is worth noting that Don Bosco's use of expressive techniques along with Preventive method anticipates by a hundred years the ideas of the twentieth century humanistic psychology and education. Through the encouragement of personal and community expression, Don Bosco gave young people opportunities for maturing in body, mind and spirit, for leadership, for talent-development, for becoming honest citizens capable of contributing positively to the betterment of the society. This harmonious blend of the preventive and expressive methods distinguishes Don Bosco's educational approach from other preventive approaches of his time.

Salient Features of Don Bosco's Preventive System

No Corporal Punishments

Don Bosco was completely against the idea of corporal punishments. He believed that when an youngster is afraid, he rarely learn anything. In fear, the youngster often acts in order to please the one he/she fears. In fear all that matters are how one performs in front of the educator than what one thinks about the educator and what they teach us. The pupil becomes dishonest and only learns the art of wearing a mask of honesty in front of his/her educator. Don Bosco believed that the fear of punishment makes the youngster dependent on others. The youngster is afraid of making mistakes and thus loses confidence in oneself. He/she looks to others for solutions to his/her problems. They lack self-confidence and self-appreciation and come to believe that they are incapable of success.

Loving Kindness

Don Bosco's method of education is based mostly on the idea of good relationship between the educator and the educand. For him there is no learning without a relationship. The more loving and trusting the relationship is, the greater is the confidence of the pupil with respect to what is learned. A student performs better when he/she loves the teacher. It is difficult for them to forget what they have learned; especially the lessons of life, when they learn it from a person they respect and love. The time spent with such an educator becomes a lifelong experience. An educator of that caliber becomes a model, that the young want to imitate. Don Bosco's maxims for such an educator are; "Love what the young love, that they may love what you love."

"Familiarity breeds affection. Affection breeds confidence". "It is not enough to love; they must know that they are loved". Loving kindness makes the educator to draw out the best in every educand.

The rapport that exists between a teacher and student makes the learning a joyful event. The learner is never afraid to make mistakes. In an ambiance of love the learner is never afraid to make any mistakes. He is willing to take risks and each failure becomes a step towards success. This increases the self-confidence of the student and increases creativity.

The teacher must have the qualities of head and heart in order to be a good educator according to the mind of Don Bosco. The educator must listen to the young in order to understand them and not to find fault with them. They should not be judgmental. The young need attention. The availability of the educator to the needs of the young, is another important quality of an educator. He must be physically present with them. An educator should be available to them beyond the four walls of the class room. Learning for life takes places not always in classrooms but in places like playgrounds, theatre, music classes, picnics, excursions and other time of recreations and extracurricular activities.

Reason

Reason is an inevitable element in the education of the young in Don Bosco's method of education. It is indispensable because it safeguards a relationship based on love to wane into mere sappiness. It checks out anything turning into extremes or exaggerations. The educator has to encounter one's students with a disposition of respect that help learning. The rules that an educator forms must be based on common sense. There should not be too many rules. The life of the young becomes easy and enjoyable with as less regulations as possible. The rules must be simple and clear to the mind of the young. It must be explained orally and in writing. The conviction that following a certain rule brings in benefits to their life, makes it easy for the young to follow the rule. The youth are impulsive so they turn to forget the rules. So it is the duty of the teacher to timely remind them of the rules without irritating them.

The young must understand the fact that all the rules are not of same value. Therefore, what is more important have to be followed to the letter and the educator must allow a few concessions to the not so important ones. The educator must get the opinion of the students when formulating certain rules or making the students themselves to formulate some. This will make them to follow the rules without fail. The educator must evaluate the rules timely as to perceive the efficacy of those rules. Those rules that do not have value due to the change of time need to be removed. For Don Bosco an educator must place himself into the situation of the educand and see if the formulation of a rule is actually helpful.

Religion

As a Catholic priest for, Don Bosco, religion and belief in God played an important role in the education of the young. Though he encouraged expression of one's talents and gifts in a joyful environment, he demanded silence when it was time for prayer. Faith is an aspect that he believed will help a person in moments of difficulties. He taught the students to pray and enter into a loving relationship with God. He placed a lot of

importance to afterlife. He was a realist. He taught the students to live keeping in mind their grave and as a Christian he imparted an education skilling them to live by eyeing heaven. This made them to take wise decisions about their life and live with a sense of hope. For Don Bosco the best way to serve God is to fulfill one's duty to the best of one's ability. He also reminded the students to be happy in doing one's duty which included every aspect of their life. Religion also played a big role in making the young service minded. He believed in helping the underprivileged as a means to serve God.

Presence of the Educator and Personal Relationship with the Educand

The success of Don Bosco in the practice of the preventive system of education was that he made the system workable for the youth of his time. He was able to utilize it for a group of youngsters who had nowhere to go and nobody to look after. He localized the practice of this system according to the need of the time. For him the joyful expression of a youngster is in the place where he is and not where he was and nor where he will be. So the presence of the educator at the places of learning of the student, is an important aspect in the educational methodology of Don Bosco. The educator has to be fully present with the student or the student has to be in the eyes of the teacher during learning. This is a great responsibility and it is highly demanding on the educator. The educator should not see it as a burden, but a privilege and an opportunity for the holistic growth of the pupil.

The presence of the educator must be a welcoming presence. An educator must be pro-active and take that first step in making the pupil feel at home. They must be hospitable and their approach must be homely. The presence of the educator must become a motivating factor for the youngster. His presence should encourage the student to perform better. The presence of the teachers infuses in them a thirst for knowledge through the tactful use of queries, puzzles, quizzes, debates, excursions, etc.

The rapport of the educator plays a major role in his presence. The personal love and care, that he shows to each student especially to the most deserving ones is the special characteristics of this method. Each student is called by name, they feel known, loved, respected and accepted. This is all the more essential with those who are poor, weak, physically and mentally challenged or socially marginalized. It is a professional approach which is based on high moral values. The respect that the educator gives to each student makes them to respect and love what the educator loves. Though the educator is asked to love what the young love, they are not expected to behave badly as to lose their self-dignity as a teacher.

Expectations from the Educator

This system of education places great expectations on the educator. Its demands are high. The educational ambiance become so complex at times that they run the risk of distancing itself from the young people. In order to avoid such situations, the educator is expected to be present physically in places where the youngsters gather, for example; in class rooms, playgrounds etc. The educator is expected to be with the students and participate in their recreational activities during breaks. This will make the teachers to leave the comfort of the staff rooms and be among

the students as friendly guides and animators. This will also give the opportunity for the teachers to get to know their students better. The dignity and modesty shown by the teacher during recreations will in the long run, earn for the teacher the respect and appreciation of the students. The educator must be matured enough to be available to offer corrections and suggestions without hurting the sentiments of the students and must be discrete in maintaining secrecy about their life and behavior.

Though the educator is far above the age of the youngsters, one must learn to enjoy their company. The style of relating to the students must be friendly and non-judgmental which allows them to express themselves freely and spontaneously. The personal and emotional issues of the educator should not become a hindrance to this. The educator must show that he/she is happy to be in the midst of the youth and to enjoy their company. The informality of the educator in the midst of youth should not distract him from his duty to be vigilant. A keen observation skill is a necessary aspect for the educator who practices this system of education. The educator must be watchful of the weak, students who remain aloof, mischievous pupils and especially the unpredictable ones. He must be a lifelong learner. The behavior pattern of the students change from time to time as the influence of the external factors on students change according to the time and place.

Conclusion

Preventive method of education is one of the best methods of educational philosophy and practice if done properly. Don Bosco envisaged it much ahead of his time. Today it is practiced in many parts of the world by the followers of Don Bosco. It is a method that makes the life of the young especially the life of the young adolescent soother. But it is a system that places a lot of demands on the educator.

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Correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students

Reji Joseph
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Abstract

The main objective of Environmental Education is to acquire awareness, knowledge, attitudes and skills to participate and solve real life environmental problems. Environmental Education must be concerned with the various aspects such as pollution, population explosion, use of resources and conservation, food and nutrition and health and hygiene. Realizing the importance of Environmental protection, Government of India has launched the National Green Corps programme in all districts of the country. The main objective of the present study was to find out whether there is any significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students. Survey method was used for the study. The sample consisted of 300 National Green Corps students, selected by stratified sampling method. For collecting the data modified version of Environmental Awareness test was used. The study showed that there is significant correlation between Environmental Awareness and Eco-friendly Behaviour of secondary school National Green Corps students.

Key Words : Environmental Awareness, Eco-friendly Behaviour, National Green Corps, Environment friendly etc.

Introduction

Environmental Education is an important segment of the present educational system. It includes all educational activities consciously confronting and attempting to overcome the environmental crisis. The objectives of Environmental Education are to acquire awareness and knowledge, develop attitudes, skills and abilities to participate in solving real life environmental problems. Environmental Education should start from the school level to pass on to posterity, our rich heritage. The goals of environmental education were defined as creating environmental awareness; impart general knowledge for a basic understanding of environment, acquiring environmental friendly attitudes and values and to generate new patterns of behaviour towards environment.

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The term eco-friendly means environment friendly. The word "eco" here means Ecology, which is a branch of biology that deals with the study of the relation of organisms with each other and their surroundings. An imbalance in the ecology can be very catastrophic, which can lead to floods, earthquakes and other natural calamities. Hence we need to rethink the way we use these natural resources and find ways to protect these resources from getting exhausted.

Today the world faces the problem of pollution. Human beings have always exploited the resources available in their surroundings for their benefit. In this state, Environmental protection is greatly essential. With this realization the Ministry of Environment and Forests and Government of India has decided to launch the National Green Corps (NGC) programme in all districts of our vast country. The main objectives of this programme are (1)educating the children about their immediate environment by increasing awareness; (2) impart knowledge about the eco- systems, their inter dependence and their need for survival, through visits and demonstrations; (3) mobilize the youth by instilling a spirit of scientific inquiry into environmental problems; and (4) involve youth in active environmental preservation.

Significance of the Study

Environmental Education must be concerned with the various aspects like pollution, population explosion, use of resources and conservation, food and nutrition, health and hygiene etc. It should be integrated with the curriculum programmes for all the learners, whatever be their age group and level of learning. Good environmental education must be a perfect instrument to develop environmental consciousness among students. It is better to teach the pupils first about the natural phenomena in order to understand the complex environmental matters. Environmental education sensitizes both young and adults to the cause and effect of environmental problems and issues.

Nature is the first teacher of human society. One learns the first lessons of love and endurance from his school. However, drastic changes have been taking place swiftly in all realms of life. Man has now reached a state marked by extinct species, rapid deforestation, decline in agricultural growth, global climate change, rampant pollution, ozone depletion, new health hazards, increasing poverty, and various social injustices. To gain deeper knowledge about nature and the sundry environmental problems is the need of the hour. It is imperative to equip the new generation to be a part of the concerted efforts to better the surroundings. Hence, eco-clubs have been formed with a view to promote the participation of students in environmental studies and different activities of protecting the environment. National Green Corps (NGC) is a programme of the Ministry of Environment and Forests and the Government of India. Environmental activity in schools in India is promoted through the National Green Corps. It enables the young minds to know the environment better and deeper. Bio diversity conservation, water conservation waste management, land use planning, energy conservation are the activities of National Green Corps. In this background, the study of the investigator on the significance of environmental studies is highly relevant and pertinent. The investigator endeavours to ascertain the members of National Green Corps' love for nature and the practical steps taken to protect her.

Statement of the Problem

The present study is an attempt to find out whether the two variables, Environmental awareness and Eco-friendly behaviour are

interrelated. The statement of the problem is Correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students.

Operational Definition of Key Terms

Environmental Awareness

Environmental Awareness is indicative of one's own environment. Environmental Awareness is an awareness of subsequent desire to preserve natural resources and giving a 'green' life style for our children.

Eco-friendly Behaviour

Eco-friendly behaviour means earth friendly or not harmful to the environment. This term most commonly refers to products that contribute to green living or practices that help to conserve resources like water and energy.

National Green Corps

National Green Corps is a programme initiated nation-wide by the Ministry of Environment and Forest and Government of India, with school children at the vanguard of a campaign to green the earth. The main objectives of this programme are: educating the children about their immediate environment by increasing awareness, impart knowledge about the eco- systems, their inter dependence and their need for survival through visits and demonstrations, mobilize the youth by instilling a spirit of scientific inquiry into environmental problems and involve youth in active environmental preservation.

Secondary School Students

The Secondary School Students means those who are studying in classes eight, nine and ten in any school recognized by the Government of Kerala. Here, the investigator selected eighth and ninth standard only.

Objectives of the Study

1. To find out whether there is any significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students.

2. To find out whether there is any significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to gender (Boys & Girls).

3. To find out whether there is any significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to locality (Rural & Urban).

4. To find out whether there is any significant difference in Environmental Awareness among Secondary School National Green Corps Students with respect to gender (Boys & Girls).

5. To find out whether there is any significant difference in Environmental Awareness among Secondary School National Green Corps Students with respect to locality (Rural & Urban).

6. To find out whether there is any significant difference in Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to gender (Boys & Girls).

7. To find out whether there is any significant difference in Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to locality (Rural & Urban).

Hypotheses of the Study

1. There is significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students.

2. There is significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to gender (Boys & Girls).

3. There is significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to locality (Rural & Urban).

4. There is significant difference in Environmental Awareness among Secondary School National Green Corps Students with respect to gender (Boys & Girls).

5. There is significant difference in Environmental Awareness among Secondary School National Green Corps Students with respect to locality (Rural & Urban).

6. There is significant difference in Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to gender (Boys & Girls).

7. There is significant difference in Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to locality (Rural & Urban).

Method Adopted for the Study

The investigator adopted Normative Survey Method for the present study.

Population and Sample of the Study

All the National Green Crops Students of secondary schools in Ernakulam District were considered as the population. Three hundred (300) National Green Crops Students were selected as the sample by stratified random sampling method. The sample involved boys and girls belonging to urban and rural area of eighth and ninth standard students.

Tools Used for the Present Study

The tools used for the study were:

1. Modified Version of Environmental Awareness Test constructed and standardized by Dr. Mrs. Haseen Taj for measuring Environmental Awareness.

2. Eco-friendly Behaviour Rating Scale constructed by the investigator for measuring the Eco-friendly Behaviour among National Green Corps Students.

Statistical Techniques Used

♦ Karl Pearson Product Moment Correlation

♦ Test of significance of difference between means (t-test)

Analysis and Interpretation of Data

Cor-relation Analysis for the Total Sample

In order to test whether there exists significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps students the r value was calculated and results are given in table 1

Table 1

Correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students

Variables	Sample size (N)	Calculated 'r' value	Table value	Interpretation
Environmental Awareness & Eco-friendly Behaviour	300	0.615	0.148	Significant at 0.01 level

From the table it is observed that the calculated 'r' value 0.615 is greater than the table value 0.148 at 0.01 level. It means that there is significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students.

Correlation Analysis based on Gender

The correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students were calculated separately for boys and girls. The r value obtained for boys and that for girls are given in table 2

Table 2

Correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students based on gender

Gender	Sample size (N)	Calculated 'r' value	Table value	Interpretation
Boys	150	0.689	0.208	Significant at 0.01 level
Girls	150	0.543	0.208	Significant at 0.01 level

Table 2 shows that the calculated 'r' value for boys 0.689 and that of girls is 0.543. Both the values are greater than the table value 0.208 at 0.01 level. So it is clear that there is significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps boys and girls.

Correlation Analysis based on Locality of Schools

The correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students was calculated separately for rural and urban students. Its results are presented in table 3.

Table 3

Correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students Based on locality

Locality	Sample size (N)	Calculated 'r' value	Table value	Interpretation
Rural	150	0.644	0.208	Significant at 0.01 level
Urban	150	0.594	0.208	Significant at 0.01 level

Table 3 shows that the calculated 'r' value for rural students 0.644 and that for urban students o.594 is greater than the table value 0.208 at 0.01 level. So it is clear that there is significant correlation between Environmental Awareness and Eco-friendly Behaviour of

Secondary School National Green Corps Students of both rural and urban locality.

Comparison of Environmental Awareness based on Different Sub Groups

Comparisons are made based on gender and locality of the schools.

Comparison based on Gender

To test whether there is significant difference in Environmental Awareness among Secondary School National Green Corps Students with respect to gender, the 't' value was calculated and it is presented in table 4.

Table 4

Data and results of t test for comparing boys and girls of secondary school National Green Corps Students with regard to Environmental Awareness

Group	Sample Size (N)	Mean	SD	't' value	Interpretation
Boys	150	28.90	3.032	0.576	Not Significant at 0.01 level
Girls	150	28.70	2.980		

The obtained value of mean for National Green Corps boys and girls are 28.90, 28.70 respectively. The corresponding standard deviations are 3.032 and 2.980 respectively. Its bar diagram is also given in figure 1.

Figure 1

Mean and SD of the scores of boys and girls of secondary school National Green Corps Students for Environmental Awareness

From table 4 it is observed that the calculated 't' value 0.576 is less than the table value 2.59 at 0.01 level. So it is concluded that, there is no significant difference in Environmental Awareness among Secondary School National Green Corps Students with respect to gender.

Comparison based on Locality

The values calculated in relation to the significance of difference in Environmental Awareness among Secondary School National Green Crops Students with respect to locality is given table 5.
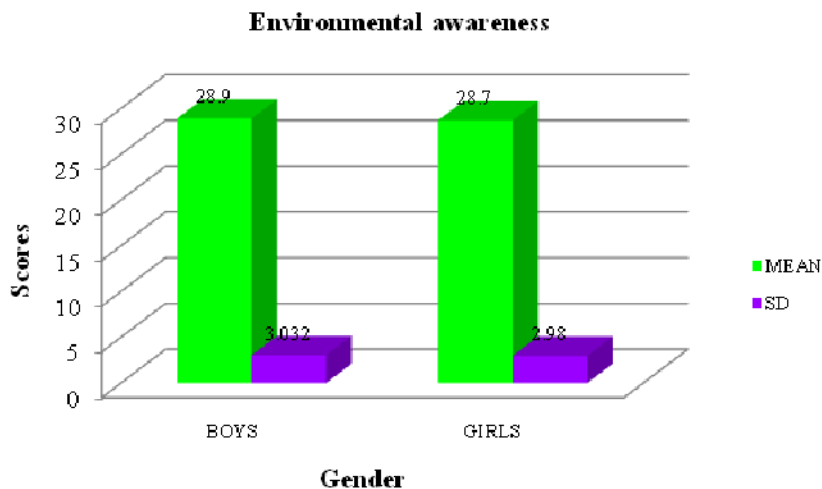
Table 5

Data and results of 't' test for comparing rural and urban secondary school National Green Corps Students with regard to Environmental Awareness

Group	Sample Size (N)	Mean	SD	't' value	Interpretation
Rural	150	28.79	2.988	0.038	Not Significant at 0.01 level
Urban	150	28.81	3.027		

The obtained values of means for National Green Corps Rural and Urban Students are 28.79, 28.81 respectively. The corresponding standard deviations are 2.988 and 3.027. A bar diagram representing these statistics is given in figure 2.

Figure 2

Mean and SD of the scores of rural and urban secondary school National Green Corps Students for the variable Environmental Awareness

From table 5 and figure 2, it is clear that there is only slight variation in mean scores of Rural and Urban National Green Corps Students on Environmental Awareness. The calculated t value 0.038 is less than the table value 2.59 at 0.01 level. So it is concluded that there is no significant difference in Environmental Awareness among Secondary School National Green Corps Students with respect to locality.

Comparison of Eco-friendly Behaviour based on Different Sub Groups

Comparisons of Eco-friendly Behaviour are made based on gender and locality of the school.

Comparison based on Gender

The values of means and standard deviation of Eco-friendly Behaviour obtained for boys and girls, and the 't' value is given in table 6

Table 6

Data and results of t test for comparing boys and girls of secondary school National Green Corps Students with regard to Eco-friendly Behaviour

Group	Sample Size (N)	Mean	SD	't' value	Interpretation
Boys	150	133.19	9.61	1.361	Not Significant at 0.01 level
Girls	150	134.63	8.61		

The obtained value of mean for National Green Corps boys and girls are 133.19, 134.63 respectively. Using this figures a bar diagram is also drawn as given below.

Figure 3

Mean and SD of the scores of boys and girls of secondary school National Green Corps students for the variable Eco-friendly Behaviour

From table 6 and figure 3, it is clear that there is only slight variation in mean scores of boys and girls National Green Corps Students on Eco-friendly Behaviour. The calculated 't' value 1.361 is less than the table value 2.59 at 0.01 level. So it is concluded that there is no significant difference in Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to gender.

Comparison based on Locality

The values of means and standard deviation of Eco-friendly Behaviour obtained for rural and urban students and 't' value calculated to determine the significance of difference in means is given in table 7.
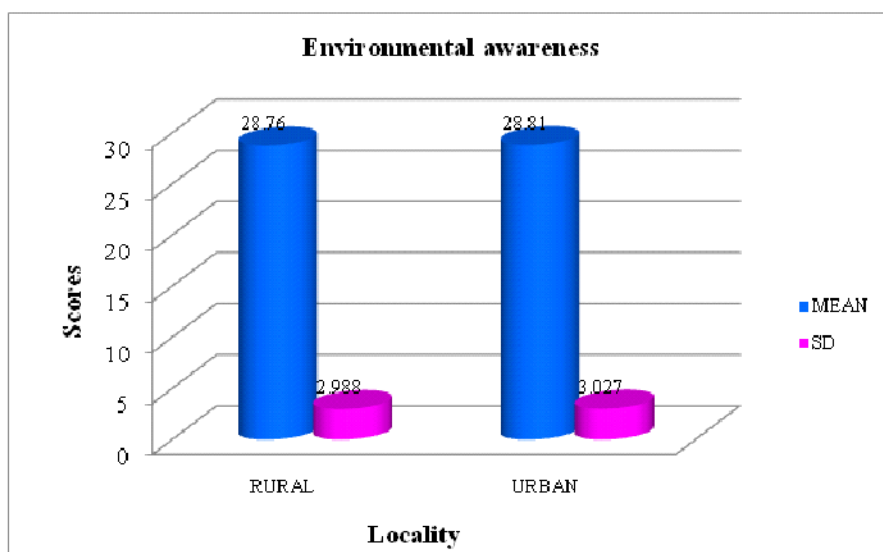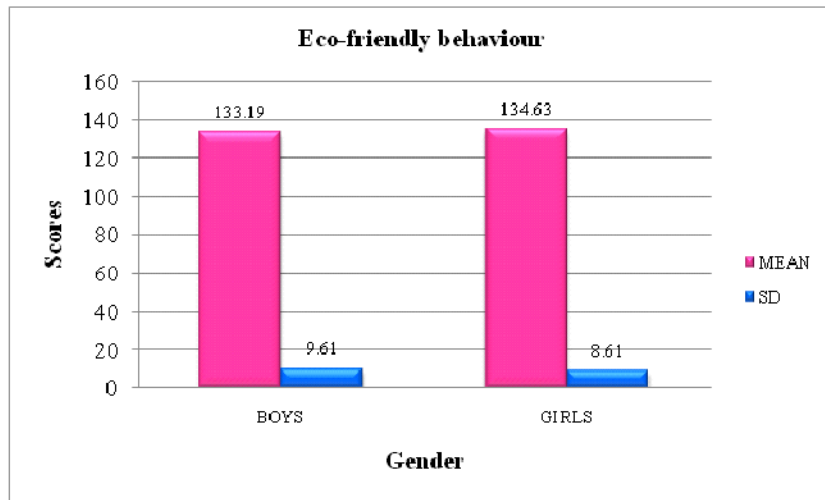
Table 7

Data and results of 't' test for comparing rural and urban secondary school National Green Corps students with regard to variable Eco-friendly Behaviour

Group	Sample Size (N)	Mean	SD	't' value	Interpretation
Rural	150	132.84	9.74	2.039	Not Significant at 0.01 level
Urban	150	134.98	8.39		

The obtained value of mean for National Green Corps rural and urban students are 132.84, 134.98 respectively. The corresponding standard deviations are 9.74 and 8.39 respectively. Its diagrammatic representation is given in figure 4.
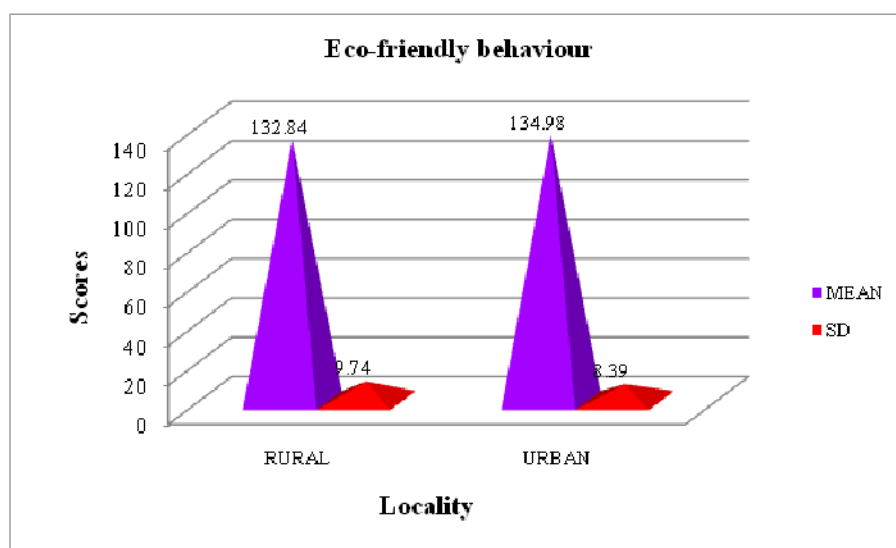
Figure 4

Mean and SD of the scores of rural and urban secondary school National Green Corps Students for the variable Eco-friendly Behaviour

From table 7 and figure 4, it is clear that there is only slight variation in the mean scores of rural and urban National Green Corps Students on Eco-friendly Behaviour. The calculated t value 2.039 is less than the table value 2.59 at 0.01 level. So it is concluded that there is no significant difference in Eco-friendly Behaviour among Secondary School National Green Corps Students with respect to locality of schools.

Major Findings of the Study

1. The correlation between Environmental Awareness and Eco-Friendly Behaviour ('r' value obtained is 0.615), is greater than the table value 0.148 at 0.01 level. It shows that there is significant correlation between these variables.

2. The 'r' value between Environmental Awareness and Eco-Friendly Behaviour for boys is 0.689 and that for girls is 0.543. Both the values are significant at 0.01 level.

3. The correlation between Environmental Awareness and Eco-Friendly Behaviour is significant at 0.01 level for both rural and urban school students. The 'r' value obtained is 0.644 and 0.594 respectively.

4. There is no significant difference in the Environmental Awareness with respect to gender. The 't' value obtained in the case of gender is 0.576, which were smaller than the table value 2.59.

5. The 't' value obtained for Environmental Awareness based on locality is 0.038. It is less than the table value 2.59. It shows that there is no significant difference between the means with respect to locality of schools.

6. There is no significant difference in the Eco-Friendly Behaviour with respect to gender. The 't' value obtained is 1.361, which is smaller than the table value 2.59 at 0.01 level.

7. There is no significant difference between the Eco-Friendly Behaviour of rural and urban school students, being the 't' value obtained 2.039 is less than the table value 2.59.

Implications of the Study

The study reveals that there is a significant correlation between Environmental Awareness and Eco-friendly Behaviour among Secondary School National Green Corps Students. It is also revealed that, corresponding to an increase in the Environmental Awareness of National Green Corps students there is an increases in the Eco-friendly Behaviour also. Based on these findings some of the implications of this study are described as follows.

1. Education system may include special emphasize on the preservation of nature.

2. The school authorities can make necessary arrangements to inculcate the value of nature preservation among teachers and students.

3. The members of the National Green Corps Programme could be motivated to impart their knowledge to the peer group.

4. The local self governments can initiate programmes to nurture nature.

5. A group named 'Eco-friends' or 'Green friends' can be formed from each standards to make the society vigilant.

Conclusion

Education is the most potent instrument to effect the social, economic and national development. The study gave a spot light in the field of education. The investigator examined the result of the study. It showed a significant correlation between Environmental Awareness and Eco-Friendly Behaviour among National Green Corps Students.   Nature is a valuable treasure given by the Creator to pass on to posterity. Hence, she must be protected, loved and nurtured at any cost. The investigator endeavours to ascertain the members' love for nature and the practical steps taken to protect her.

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Bridging the Gap in Problem Solving and Techno-Pedagogical Skills among Pre-Service Teachers

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Abstract

Technology is the major driving force for change. Problem solving is at the forefront of teacher trainees. Teacher is the person who gives the students an ideal picture by providing learning environment to grow in their own place. The study focuses on Pre-service teachers need to develop technical expertise, Problem Solving skills, and Techno-Pedagogical skills. Problem solving skills in pre service teachers increases their Techno-Pedagogical skills. This study explains the need of developing problem solving skills and Techno-Pedagogical skills among Teacher Trainees. Teacher educators and training graduates must also adapt and change and be familiar with using emerging technologies that can encourage student participation. Thereby the teacher trainees can enhance their knowledge and increase the usage of this programme.

Key Words : Problem Solving skills, Techno-Pedagogical skills, Pre-service teachers etc.

Introduction

The concept of teacher education is undergoing a rapid change throughout the world. Teacher's use of technologies has an important role in education in the 21st century. Technology can provide powerful environments eliciting modern views of learning but may not change teacher's beliefs and practice. Technology is the major driving force for change. Technology in the classroom is becoming more and more predominant. It is an integral component of teaching and learning. Technology is a science applied artistically in a systematic way. Since teaching is essentially an on-going problem-solving process, teachers who are better problem solvers are likely to be more effective teachers in their classrooms (Gage & Bediner, 1991). Learning and teaching with technology is hard, it can be overwhelming, and the field is always changing. (Jacobsen, Clifford, and Friesen, 2001).

Teacher Education emphasizes the development of specific knowledge, attitude, skills and behavior patterns which an individual requires to perform the job adequately. So this education should develop those skills which are needed for a prospective teacher to become an excellent professional teacher. Teacher education and eacher professional development are facing important qualitative and quantitative challenges.

Problem Solving is a mental process involving the ability to analyze and find the solution that best resolves the problem. Problem

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solving skills are one of the most important, areas of the curriculum. They are relatively specific cognitive operations. This study outlines an approach that encourages pre-service teachers to develop both techno-pedagogical skills and problem solving skills to provide experiences for the students that will help them effectively infuse technology into their future classrooms.

Meaning of Problem Solving Skills and Techno-Pedagogical Skills

Carpenter (1989) says that Problem solving activities are often viewed as a method to practice, applying new knowledge and skills learned earlier in a different context. Problem solving involves the ability to explore, think through an issue, and reason logically to solve routine as well as non routine problems. According to Serrano, et. al. (2003), the problem solving is a complex mental process involving visualization, imagination, manipulation, abstraction and the association of ideas. Problem solving requires unique and original responses.

Techno-Pedagogy implies the blending of technology with solid pedagogical principles. It is a deciding factor to determine whether an educational media product is successful or not. Literally pedagogy refers to the art and science of teaching and techno derived from the Latin word 'texere' means fabrication or weaving. Techno-Pedagogy refers to weaving the techniques of teaching in to the learning environment itself. It requires conscious recognition of the mediated learning environment in order to maximize the ease and clarity in the transmission of information (Koehler and Mishra, 2008).

Revamping of Pre-service Teacher Education

Problem solving as the most important cognitive process in our everyday life should be given great emphasis in education, especially in teacher education. If teachers do not possess the capacity to solve everyday problems, we cannot assume that they are able to effectively and efficiently guide our school children to become problem solvers. Teachers can help students to transfer textbook knowledge into everyday problem solving.

To provide pre-service teachers with authentic experience, real-world problems that resemble those that they will likely have to solve in schools could be presented in digital case format and integrated seamlessly across the teacher education curriculum. At the end of the day, it is most critical to prepare pre-service teachers for the real world challenges and teacher education programs must seek to design meaningful learning experiences that could enable pre-service teachers to apply the skills and knowledge they will learn from the teacher preparation courses in their future teaching.

Problem Solving as a Cross-Curricular Skill of Teachers

To be able to respond to all of the challenges the profession holds, teachers are required to have a wide range of competencies. However that is why several experts claim that problem solving (including decision making) is the key feature in the profession. Teachers must be prepared to handle unanticipated situations, to adapt current knowledge to deal with new problems, to learn radically new things in short, to deal constructively with change. According to many researchers, teachers solve problems not only during the interactive, classroom teaching phase but also when they evaluate the previous lesson and plan for the next. In this respect, the whole pedagogical process, starting with planning and concluding with (self)evaluation, is seen as analysing, acting, reflecting, making

decisions and solving problems . Every element of the teaching profession is therefore permeated by problem solving: Teaching is increasingly seen as a professional activity requiring a careful analysis of each situation, choice of objectives, development and monitoring of suitable learning opportunities, evaluation of their impact on students' achievement, responsiveness to students' learning needs and a personal or collective reflection on the whole process.

Since problem solving skill can be the link between knowledge and action, declarative and procedural knowledge, it has an important knowledge transfer role too. It includes divergent (creative or lateral) and convergent (critical) thinking processes as well as systems thinking. All things considered reveal that problem solving skill is not related to a special competence: instead, it is interlinked with all the key teacher and teaching competences as a cross-curricular one. Therefore it should be one of the indispensable high-level skills teachers need in order be able to answer all the challenges they face on every level and every aspect of the profession. Professionals can frame and reframe a problem as they work on it, testing out their interpretations and solutions, combining both reflection and action.

Importance of Techno-pedagogical Skills for Teacher Educators and Training Graduates

Teacher Education holds the most crucial position and helps in the success of any educational system. A teacher educator is the topmost academic and professional person in the educational pyramid who shapes the future teachers and the onus of quality of teachers. Technology is a broad and constantly changing skill-set required of faculty, and selecting the appropriate techno-pedagogical strategies to effectively engage students in the content is a

separate skill-set. Media literacy influences student development, and developing a critical analysis of media consumption is an important skill for students. For understanding how technology and media intersect with learning, the compatibility between theories of technology and education, and its relation to the content can be considered. There is a need for Teacher Educators and Training Graduates, as well as the institutional level, to identify and articulate the occupational realities when technology and competencies intersect.

Conclusion

Education plays a vital role in enriching the society and human resource. Teacher educators and training graduates can play an effective role only if they are prepared in a creative, resourceful and efficient manner to use techno-pedagogical skills to nurture the students as per the demand of the changing times. Teacher educators and training graduates must also adapt and change and be familiar with using emerging technologies that can encourage student participation. Teaching with use of modern technical facilities enhances student's knowledge and improves the teaching-learning process in this fast changing complex world. Teachers need technology education to develop technical expertise, problem solving skills, and the ability to foster the problem solving skills of their students. These abilities will not likely occur by chance. The competencies needed to teach problem solving must be taught to prospective teachers. These recommendations may serve to guide the selection of instructional practices, the development of curriculum, and the assessment of problem solving instruction in pre-service technology teacher education. Research indicates that changes in ways of preparing teachers will result in changes in classroom

performance. The challenge to technology teacher educators is to select and implement the most effective teaching procedures.

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Mindfulness : A Creative Path to Awareness and Ecological Transformation

Sija George
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Abstract

A new vision of Education is urgently needed to bring about a revolution which will involve individuals in a process of change. It must inspire individuals to follow a new understanding of education that can bring about a transformation of values in the interest of not only the person, but also the society at large. Mindfulness enhances the richness and vitality of moment to moment experiences. It heightens our perceptual awareness of our surroundings giving us a better geographic and ecological consciousness. Meditative Mindfulness and Cognitive attentional Mindfulness, the two ways of Mindfulness are used in therapy. Intention, attentiveness and attitude are three backbone concepts of Mindfulness practice.

Key Words *: Mindfulness, Intention, Attentiveness, Attitude, Decentring etc.*

Introduction

If the world is to change for the better, it must start with a change in human consciousness. The aim of Mindful awareness is to firmly implant in your mind the certain knowledge that a change in your own consciousness change the world. So the preposition is that the more people began to change their consciousness by any route the more the world changes. In a mindful state, people do not sense and feel themselves separate from everything that enters their mind. In mindful experiences there is a sense that self and world arise together moment by moment. The general perspective is that if people feel connected to nature, then they will be less likely to harm it. Mindfulness practice can make a vital contribution to become environment friendly by helping us to discover a better connection with nature and hence being able to appreciate its intrinsic value.

Mindfulness

Mindfulness is a universal human capacity that is accessible to everyone. Originating in Buddhist philosophy and psychology, mindfulness embraces a way of being present in the world. It is a scientific term as opposed to terms like conscious presence or joyous attentiveness. Mindfulness means to be aware of what is happening in our present experiences, observing with compassion, insight and an intention to create joy.

Mindfulness is about paying attention to how things are in the present moments. John kabat-Zinn(1994) has characterized

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mindfulness as " paying attention in a particular way : on purpose, in the present moment, and non-judgementally" Despite a myriad of overlapping definitions most agree that when a person is mindful they are open, receptive and fully engaged with what is happening at the time (Brown and Ryan, 2003: Chatzisarantis and Hagger, 2007)

Mindfulness is derived largely from Eastern philosophies and contemplative traditions. Buddhist meditation practices encourage concentration, clarity and the cultivation of calm and positive ways of being as a way of life.

In Buddhist psychology, the silent mind help us to address emotional tensions through our five senses. When we turn inward through meditation, we begin to observe inner consciousness with detached awareness. Stilling the mind aids relaxation. The practice often begins by paying attention to the breath while mentally scanning the body or repeating a word or Mantra. As we shift from the ordinary, everyday consciousness to inner stillness, we may begin to notice our thoughts and feelings as well as the environment around us.(Siegel, 2007)

Two Ways of Approaching Mindfulness

Two ways of mindfulness are used in therapy. One is meditative mindfulness, the other is cognitive attentional mindfulness. Despite their differing approaches, both derive from Buddhist practices, although they seek to reduce suffering in the conventional sense, rather than through Buddhist ideals of enlightenment (Dorjee, 2010). While meditation involves contemplative practice through inner stillness, cognitive attentional methods borrow solely from the active component of the mind in meditation, which is mindfulness.

When a person sits quietly in meditation, the mind becomes calm and the body relaxed. While ruminating, the mind has a tendency to cling to thoughts, feelings, perceptions, attitudes and so on whether they are real or imagined(Mikulas, 2011). Furthermore concentration through meditative mindfulness aids relaxation by activating awareness on the content of mind, in a detached, observing and non-judgemental way.

Mindfulness practice can be seen overall as an intentional, systematic way of developing a compassionate and insightful presence in the world. There are formal and informal mindful practices. Formal practice involves regular exercises while we are sitting or walking that can be incorporated into daily life as simple short meditations. We may explore these meditations more profoundly at immersion retreats where we can gain greater understanding of the practice and learn new habits.

Informal practice refers to the use of mindfulness in daily life where we establish an attentive presence while performing daily activities. Mindfulness practice is based on effectiveness to breathing. This process makes us aware of the subjective and transient nature of our thoughts and feelings rather than regarding them as permanent and valid. Our pre conception about a colleague, parent or child stand in the way of our working well together because we don't look deeply at the spontaneous judgement or hostility we feel. Then it dawns on us that the person we are judging is actually quite different from our initial perceptions. Mindfulness practice can help us steer clear of the judgements that cloud our interactions with others. (Davis, 2015)

Intention, Attentiveness and Attitude

Three concepts form the backbone of our mindfulness practice. They are:

1. Intention
2. Attentiveness
3. Attitude

Intention is the direction we have for our practice. In mindfulness the overall direction is to create more happiness and less suffering for ourselves and others. There are two kinds of happiness: hedonism and eudaimonia. Hedonism is built on the notion the pleasure creates happiness. This happiness is temporary and primarily centred around our desires being satisfied. Eudaimonia-the happiness that mindfulness practice brings is the happiness we experience when we feel connected to other people. This is the kind of happiness that makes us flourish. Intention is not an aspiration making us forget the now in favour of dreams we have for the future. Intention is a motivation connected with the now.

Attentiveness refers to a method of sharpening our affection, giving us a clear view of what is going on in the present moment. Unstable affection is like an unstable camera the picture is blurred. Mindfulness practice is based on - through effectiveness to our breathing - accepting the thoughts and perceptions that come to our attention, regardless of their nature. This bring focus and inner calm. There are two types of attentiveness. Focused attentiveness is directed towards a chosen object and open, receptive attentiveness registers whatever comes and goes. Both are exercised in mindfulness practice.

Attitude is the manner in which we relate to whatever comes to our affection. It is important that we have an attitude of compassion and acceptance. We recognise that there can be several perspectives on a particular matter on our own thoughts. We also refrain from identifying with the thoughts and emotions that arise in the moment. That is how we learn that we are neither the thoughts in our brain, nor the feelings that can be so overpowering (Rotne and Rotne, 2012).

Decentring and Disidentification.

Two other important concepts that inform our mindfulness practice are decentring and disidentification. Decentring refers to the idea of observing something without identifying with it. Traditionally many of us observe the world through the filter of how it affects us and our own situations.

Practising decentring give us the possibility to observe our thoughts, feelings and sensations as they play themselves out without being controlled by them. It allows us to step out of our mental dreams and bear witness in a non-judgemental manner.

Decentring allows us to choose consciously how we want to respond to external stimuli. Disidentification is a key part of decentring. Practising disidentification allows our thoughts, feelings and sense impressions to be there without identifying ourselves with them. When you disidentify, you find that your opinions, thoughts and feelings around a given situation do not threaten your own self image, and the discussion can be a meaningful, productive exchange of views.

Mindfulness practice brings to our lives a serious of greater insights. As we practice being affective we are able to see ourselves more and more as part of a context, and we identify with our own thoughts and emotions less and less. Mindfulness practice facilitates

a greater sense of separation from the world. Mindfulness practice facilitates a greater sense of connection to the world. This in turn bring us happiness and a greater sense of responsibility. Through continuous practice we build a mindful presence, gradually changing our way of being in the world (Rotne and Rotne, 2012).

Mindful Awareness

Direct experience in the present moment has been described as a fundamental part of Buddhist, Christian, Hindu, Islamic, Jewish and Taoist teachings. In these religious traditions, from mystical Christianity with centring prayer to Buddhist , one sees the use of the idea of being aware of the present moment in a different light from the cognitive aspect of mindfulness.

Reflection on the nature of one's mental process is a form of 'metacognition' thinking about thinking in the broadest sense, when we have meta- awareness this indicate awareness of awareness. Whether we are engaging in yoga or centring prayer sitting and sensing our breathing in the morning or doing at night , each mindful awareness practices develops this capacity to be aware of awareness.

Awareness of awareness is one aspect of what we can consider a form of reflection. In this way, mindful awareness involves reflection on the inner nature of life, on the event of mind that are emerging, moment by moment. Being mindful opens the doors not only to being aware of the moment in a fuller way but by bringing the individual closer to a deep sense of his or her own inner world, it offers the opportunity to enhance compassion

and empathy. Mindfulness is not "self indulgent" it is actually a set of skills that enhances the capacity for caring relationships with others.

A mindful approach to therapy and to education involves a shift in our attitude. Towards the individuals with whom we work. The active involvement of student in the learning process enables the teacher to join as a collaborative explorer in the journey of discovery that teaching can be we can embrace both knowledge and uncertainty with curiosity, openness acceptance and kind regard. The teachers do not have to be a source of the illusion of absolute knowledge (Siegel, 2007).

Mindfulness for Creativity

To enhance creativity and problem solving you need to cultivate three skills. Firstly you need an open that can gather and then integrate new ideas, concepts and information. This is known as divergent thinking and it happens on both the conscious and unconscious levels. Secondly you need to consciously notice the new ideas created by your mind and to realise their significance. And thirdly you need the courage of follow your ideas wherever they should lead -and the resilience to cope with the inevitable attacks and set backs.

Mindfulness for creativity operates on two level. The first level clears the mind and allows innovative ideas to take form and crystallise. It allows the mind to work more effectively so that you can began to solve problems faster and more intuitively. Mindfulness also helps decision making by dissolving anxiety, stress, frustration and depression.

Secondly mindfulness creates a mental vantage point from which you can observe just

how much of your life controlled by habitual ways of thinking and approaching the world. Such renewed clarity will help you tackle the habits that constrain creativity and effective problem solving. Habit breaking as simple as taking a different route to work or spending a little time walking around a park or it might mean listening to your favourite music with fresh ears or drinking a cup of tea with your eyes closed. Such simple things broaden awareness, spark curiosity and open the door to serendipity (Penman, 2015).

Mindfulness and Creative Transformation

Mindfulness is the core practice in the act of creative transformation, the key to achieving open -mind consciousness. It allows you to discover your courage and let go of avoidance behaviour and resistance, tune into your deepest inner resources and move forward in the right direction. Cultivating mindfulness you are building mind strength. Mind strength is the ability to very quickly and easily shift out of reactive mode and became fully present in the moment, experiencing the full force of your emotions even as you recognise that they are temporary and will soon dissipate. Mind strength gives you mastery over your thought and feelings, opening your eyes to whether the product of your mind are useful tool for self -discovery. Together mindfulness and an art of creative transformation allows you to access the wisdom, insight, and deepest resources of the core self. With mindfulness training, you first began to watch and observe your mind in order to develop insight into how it works as you study it. Through this practise of moment by moment nothing, observing and listening to what arises in your mind, you quickly come

to discover that you are integrated into a vast body of billions of their being with consciousness all struggling to flourish and interact with effectiveness and inventiveness in an ever changing world.

Mindfulness meditation stimulate the right hemisphere of the brain and allows you to achieve open mind, where you lose your awareness of time, feel sense of spaciousness and become receptive to unseen possibilities. Increased right brain activity helps you become more creative and intuitive over all and better able to access your unconscious mind. If you want to envision something fresh and original, a life that more fulfilling and energizing, you have to engage in contemplation which awaken the right brain -and that is at the core of mindfulness meditation (Alexander, 2008).

Conclusion

In order to respond in a faithful fitting way to the ecological crisis we need to be aware of what is going on with our human family and our planet earth. If our approach to time hinders our ability to gain such awareness, then that approach is to be sacrificed. Too much is to stable to let ourselves be swept up in a hurried, frenzied way of life. Dramatic changes in our way of life are needed to restore, ecological balance and our sense of being at home on earth. It is time to come home to earth we have been in ecological exile for too long. To come home to earth is to come to our senses and realize that the ecological destruction of earth and all of its inhabitants also negatively impacts human beings. The good news is that the reverse is also true. In promoting healing for the whole earth community, we promote our own well-being.

Thus as Maathai clarifies, "We can love ourselves by loving the earth, feel grateful for who we are, even as we are grateful for the earth's boundary; better ourselves, even as we use that self empowerment to improve the earth; offer service to ourselves, even as we practice volunteerism for the earth".

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Inclusive Education - Challenges and Barriers

Ramandeep Kaur
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Abstract

The concept and practice of inclusive education have gained more importance in recent years. It recognizes that all children are different, and that the school and the education system need to change in order to meet the individual needs of all learners- with and without impairments. Its aim is to eliminate exclusion that is a consequence of negative attitude and a lack of response to diversity in race, economic status, social class, ethnicity, language, religion, gender, sexual orientation and ability. Inclusive education is essential to achieve social equality and is a constituent element of life-long process. The main objective of the present study was to asses the challenges and barriers to access Inclusive Education. Through survey method data were collected from 20 schools and 100 teachers from Sri Muktsar Sahib, Punjab. A questionnaire and a school inventory were used as the tools. The study revealed that in the opinion of 40% of teachers, the learning atmosphere in schools is not congenial for Inclusive Education.

Key Words : Inclusive Education, Neighbourhood Schools, Children with Disabilities etc.

Introduction

Inclusive Education is a process of enabling all children to learn and participate effectively within the mainstream school systems. It does not segregate children who have different abilities or needs. It refers to the placement and education for all children with disabilities in regular education classrooms with children of the same age who do not have disabilities. The underlying premise of inclusion is that all children can learn and belong to the mainstream of school and community life. Inclusion is a basic value that extends to all children. Inclusion gives the massage: 'Everyone belongs to the school, Everyone is welcome to the school'.

Inclusion is a more precise and refined form of mainstreaming and integrated education. In the process of integration and mainstreaming, it is the child who adapts himself /herself according to the environment of the school whereas in the process of inclusion, it is the school, which adapts its policies and facilities according to the needs and requirements of the child. Integration is a school-centered policy. The focus of inclusion is not merely on academic literacy but also on emotional and functional literacy for all children. Inclusive

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education is a process that involves the transformations of schools and other centers of learning to cater for all children- including boys and girls, students from ethnic and linguistic minorities, rural populations, those affected by HIV and AIDS, and those with disabilities and difficulties in learning and to provide learning opportunities for all youth and adult as well. Its aim is to eliminate exclusion that is a consequence of negative attitude and a lack of response to diversity in race, economic status, social class, ethnicity, language, religion, gender, sexual orientation and ability. Education takes place in many contexts, both formal and non-formal, within families and the wider community. Consequently, inclusive education is not a marginal issue but is central to the achievement of high quality education for all learners and the development of more inclusive societies. Inclusive education is essential to achieve social equality and is a constituent element of life-long process.

Importance of Inclusive Education

Inclusive Education means all students attend and are welcomed by their neighborhood schools in age-appropriate, regular classes and are supported to learn, contribute and participate in all aspects of the life of school. Inclusive Education is about how we develop and design our schools, classrooms, programs and activities so that all students learn and participate together.

Children learning together in the same classroom, using materials appropriate to their various needs, and participating in the same lessons and recreation: that is inclusive education. In an inclusive school, children with disabilities do not study in separate classes; instead teaching methods, textbooks, materials, and the school environment are designed so

that girls and boys with a range of abilities and disabilities – including physical, sensory, and intellectual and mobility impairment- can be included in the same class.

Pre requisite for Inclusive Education

An important prerequisite for inclusive education is to know how many and which children are out of school and why? But providing access to people is only the first stage in overcoming exclusion. There needs to be a shift in perspectives and values so that diversity is appreciated and teachers are given skills to provide all children, including those with different   learning needs. Inclusive education is seen by many as a matter of providing education for children with disabilities in a regular school setting. Getting all children into school is just the first step at the primary level education cycle. (UNESCO, 2006)

Inclusive Education is different from special education, which takes a variety of forms including special schools, small units, and the integration of individual children with specialized support. It has grown out of the social model of disability. Inclusion does not, however, mean assimilation-or making everyone the same. A key ingredient is flexibility-acknowledging that children learn at different rates, and that teachers need skills to support their learning in a flexible way. In the majority of cases, children simply need good, clear and the accessible teaching. This includes the use of different methods to respond to children needs, capacities and rates of development.

History of Inclusive Education in India

In tracing the evolution of education in India, we must begin with the system of general education which was understood and practiced

in ancient India during Vedic Periods i.e. 5000 years back. During this period, education revolved around the system of 'Gurukuls' and the students were required to live with their 'Guru' or teacher and learn by precept as much as by actual study and debates. All children were taught together whether normal, gifted or physically or intellectually disabled. They were seen as worthy of the benefits of education each according to his or her abilities. It was 'Inclusive Education' in the truest sense. There were no special schools catering exclusively to specific disabilities or learning difficulties. Students found incapable of academic learning were given options to learn other occupations, which they would do easily, such as tending cattle, gardening, or housework. This could be rightly termed as "Inclusive Education" as it enables the disabled children to participate and interact in the natural environment with society, neighbours and the normal people and thereby making them able and creative citizens to work for the progress of nation.

Prior to the interventions done by the Government of India, in 1972, Children with neurological and multiple disabilities were not included in Government classification and no schools existed to cater to their needs. To change that situation, the first school was established in Bombay. It introduced the concept that expertise and specialist knowledge was certainly necessary to achieve the desired progress. Thereafter, a series of special schools and services were setup based on first model.

In 1975, the "Education for All Handicapped Children Act" was passed to provide free education and appropriate services to learners with disabilities. Furthermore, in Article 2 of the convention on the Rights of the Child (U.N. 1989) it was also indicated that no child should be discriminated against and every child has to receive education. The three traditional provisions of integration, identified by the Warnock Committee, i.e., vocational, social and functional have been the main methods of bringing children with special educational needs together with their peers.

The Inclusion of pupils with barriers to learning and development in ordinary schools and classrooms is a part of a Global Human Rights Movement. In 1994, at the UNESCO World Conference on Special needs education, held in Salamanca, Spain, the idea of Inclusive Education was given further impetus and was reaffirmed at the World Education Forum in Dakar in April 2000 and it was aptly captured in the statement, 'the key challenge is to ensure that a broad vision of education for all as an inclusive concept is reflected in national Government and funding agency policies. 'Education for all' must take account of the need of the poor and the most disadvantaged, young people, adults affected by conflict, HIV/AIDS, hunger and poor health and those with special learning needs'. So, the challenge of getting all children into school has been put on the political agenda in many countries and is reflected in the Forum Basic Education Action Plan in the Pacific, as well as Pacific commitments to achieving education for all.

In India also education of children with disability has been a part of National Policy on Education (1986) and the Programme of Action (1992). Two programs running currently supporting mainstreaming of disabled children are the integrated education for disabled children [IEDC] and the Sarva Shiksha Abhiyan.

Inclusive Education approach proves worthy to provide equal opportunities, keeping in mind the diverse nature of the individual

differences. Education of the disabled children has always been a residual issue in India. But it has been included in the national agenda comparatively more seriously since 1981-The International Year of the Disabled Persons. The Persons with Disabilities Act 1995 (PDA-1995) (Equal Opportunities- Protection of Civil Rights and Full Participation) has changed the earlier welfare for the disabled very positively and systematically (Bhargava, 2005).

Significance of the Study

Inclusive education is the need of the hour if we want to realize the dream of 'education for all'. But we in India are still grappling with problems of policy implementation- an environment that is not conducive for practice and a negative attitude of the people towards inclusive education. In addition, the complexity and diversity of the country requires more intensive mobilization of resources and information dissemination before inclusion can be institutionalized. With a nation still given unscientific modes of explaining natural phenomena and human conditions, where illiteracy still exists in significant proportion, the success of the inclusive school system is a big question. So it is very important to study the status of Inclusive education in Elementary schools as it is the primary step to achieve the target of Education for All. That's why the investigator was very keen to study the views and perceptions of the teachers regarding the challenges and barriers for access to Inclusive Education.

Objectives of the Study

1. To study and compare the status of Government and Private Schools regarding Inclusive Education.

2. To study the challenges and barriers to access Inclusive Education.

3. To analyze the views and perceptions of teachers regarding challenges and barriers to access Inclusive Education.

Design of the Study

Survey method was used for the present study. Views and perceptions of the Government and Private school teachers were analysed by using the content analysis method.

Sample

For the study 20 schools were selected randomly. For collecting the views and perceptions a sample of 100 teachers were taken from Sri Muktsar Sahib, Punjab.

Tools for the Study

1. A School Inventory prepared by the investigator was used to study the quality of inclusive education in different types of schoo.

2. A Questionnaire prepared by the investigator was used to study the views and perceptions of elementary school teachers regarding the quality of Inclusive Education.

Analysis of the Data

Data collected was tabulated and analyzed. The technique of content analysis was used to analyze the views and perceptions of teachers regarding various issues pertaining to status or the challenges and barriers of inclusive education. Percentage analysis was also it was wherever needed.

Findings of the Study

On analyzing the data the following conclusions were drawn:

♦ **Findings Regarding the Status, Infrastructure and Other Facilities to Promote Inclusive Education.**

1 In all schools, there is facility of fee concession and free text books for all including normal and disabled and disadvantaged students up to elementary.

2. Almost all the teachers of Government and Private schools agreed that there is no sufficient provision of counselor, physiotherapist and psychiatrist in both types of schools.

3. Almost in all private schools there are facilities of resource rooms, remedial classes, first-aid facility smart classes, barriers free rooms whereas these facilities are not so available in Government schools.

4. In 80% private schools there are facilities of audio-visual aids, helper/assistance, ramps. On the other side, in 15-20% of Government schools theses facilities are less.

5. No special funds are given by the Government to promote inclusive education in both the Government and Private schools.

♦ **Findings Regarding the Status, Need, Importance and Benefits of Inclusive Education**

1. All the Government and Private school teachers recognized the need and importance of Inclusive Education as they viewed that it is helpful for developing social skills, friendship and all round development of the personality of students and further it is also beneficial for society's welfare.

2. Almost all the teachers viewed that inclusive education promotes successful learning and creates a friendly environment to learn and give equal opportunities to all to promote successful learning. Moreover inclusive setting develops positive understanding between children with and without disability and both type of children learn from each other and develop feeling of co-operation, humanity etc.

3. Around 86% Government school teachers viewed that inclusive education is economically beneficial and affordable for India. Only14% Government school teachers viewed that it is not economically beneficial because it is very expensive and very difficult for a country like developing India.

4. It can be practical in India because Government and most of the NGO's are making efforts to make it useful and practical.

♦ **Conclusions Regarding the Attitude towards Inclusive Education**

1. Most of the teachers viewed that although most of the parents and community recognizes the importance of inclusive education and they have positive attitude towards it, parents of 20% of normal children have negative attitude towards inclusion.

2. More than 80% of teachers viewed that inclusive education is a tough task to handle disabled children with the normal students because disabled children need more time to learn anything as the pace and speed of normal children and disabled children is different.

3. Forty percent of the school teachers also viewed that learning environment is not congenial for Inclusive Education because no special facilities like special equipments,

transport, barrier free classrooms, helpers etc are provided by the Government or the school administration.

- **Findings Regarding the Views and Perceptions of Teachers Regarding the Challenges and Barriers to Access Inclusive Education**

1. Regarding challenges and barriers to access inclusion, 40% the teachers of the government and private school teachers stated that the learning environment is not congenial to inclusion,

2. In the opinion of a few numbers of the teachers normal children have negative attitude about inclusive education as they don't want to mingle with them.

3. Most of the teachers viewed that they face challenges such as shortage of time, lack of co-operation and crowded classrooms for Inclusive Education.

4. More than 80% teachers viewed that inclusive education is a tough task to handle disabled children with the normal students because they need more time to learn anything as the pace and speed of normal children and disabled children is different.

5. Lack of funds from the Government is a big barrier in access to inclusive education according to most of the Government school teachers.

6. Some of the teachers viewed that negative attitude of some of the parents of normal children and some teachers is also a big block in achieving full inclusion.

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Deploying Whatsapp in 'Use of English and Communication Skills' Class in Nigeria : Benefits and Constraints

Alexander E. Timothy

Abstract

Use of English and Communication Skills (GSS 101) is a two-credit mandatory undergraduate course in Nigerian universities. Yet, many students fail to pass it at first attempt. In order to enhance students' access to learning resources and to encourage communicative interactions in English by virtual means, the Use of English and Communication Skills lecturer formed a WhatsApp group for his class. This was intended to leverage on the mobilephones and social media used byuniversity students in Nigeria. Both the lecturer and the students used the group to share relevant contents. To find out the efficacy of the intervention, an action research was conducted. The semi-structured questionnaire and an in-depth focused group interview was conducted via the WhatsApp to appraise the benefits that participants derived from the WhatsApp group. In addition, the study investigated hindrances to participation.The thematic analysis was used in analysing the qualitative data, while simple percentages and means were used in reporting the quantitative components. The result showed that students derived cognitive and social benefits from belonging to the WhatsApp group, while economic and attitudinal factors were identified as hindrances to effective participation.

Key Words : Chats,Learning,Use of English, Whatsapp etc.

Introduction

English is a critical instrument for social and academic survival in Nigeria and even internationally. In Nigerian universities, academic discourse is conducted in English. Therefore students who have adequate facility in English learning have an academic and even social leverage. This is one of the reasons why Use of English and Communication Skills is taught to all first year students in Nigerian universities. A student cannot graduate from the university without a pass in Use of English and Communication Skills.

Unfortunately, many students find it difficult to pass the course in their first attempt. It is common to find students who should have graduated a few years back, still lingering within the precinct of the universities because they could not pass the course. Besides, inadequacy in Use of English may not only hamper their grades in the particular course, it may also affect their efficacy in all courses that require written or even oral expression in English.

While students' poor performance may be attributed to poor language background and

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myriads of second language related impediments to learning English, a present fact is that time allocated to Use of English is inadequate. In the area of the study, Use of English and Communication Skills is a two-credit hour course, but with a one-hour actual physical contact with students. For many of the students, English may theoretically be a second language, but in practice, it may be a third or fourth-order language. While English is the medium of instruction in the university, experience shows that students still exhibit acute inadequacy in the use of the language for academic and communication purposes.

What is worrisome is that modern Nigerian students have more exposure to literacy material in English than their forebears because of the internet and mobile devices that use the technology. The ubiquity, mobility, and versatility of mobile phones have made them very popular among university students in Nigeria. Therefore, the mobile phone has become almost an appendage to the average Nigerian student. Students frequently communicate with one another and even with their teachers using social networks. They use it to take and share photographs, videos, download and play music and games. Moreover, they use it to send text messages. Thus, the Internet has revolutionised literacy by querying traditional conceptions of literacy, increasing access to literacy materials and demanding newer literacy skills. A report by internetworldstats.com indicated that 92,699,924 Nigerians, that is 51 percent of Nigerians use the Internet. By August 2016, according to the Nigeria Communication Commission (NCC), the figure had increased to 93,591,174

Significance of the Present Study

One of the popular social media used by Nigerian students is the WhatsApp. The WhatsApp is a communication application that is used mainly with handheld mobile communication devices, although it is also used with desktop and laptop computers. Therefore, its use is anchored on the availability and accessibility to the internet and mobile technology. It is a type of the social media that provides synchronous and asynchronous opportunities for chats, exchange of audios, emojis, photos, text, and videos. It can be used for both audio and video calls. Therefore, the WhatsApp has a very special appeal to young people.

Therefore, this action research was informed by a need to increase instructional contact with students of Use of English and Communication Skills (GSS 101) in a Nigerian federal university. Since the officially allotted time on the timetable was one hour, the author decided to leverage on students' fond for the social media to increase access to course during and after school hours. The chosen platform was the WhatsApp since it is frequently used by students for social interaction. This study, therefore, was an assessment of the extent to which the opportunity was used by students, the perceived benefits to users, and factors that hindered utilization of the WhatsApp.

Objectives of the Study

1. To identify the benefits derived from the whatsapp group.

2. To identify the factors that contribute to access and participation in the WhatsApp Group

Research Questions

Primarily, the study sought to find out the perceived benefits of the WhatsApp group to the students. And since not all the students participated in the group, it was necessary to find out why some students would not participate in the group. Therefore, the following research questions were posed:

1. What benefits do participants derive from the WhatsApp group?

2. What factors contribute to access and participation in the WhatsApp Group?

Literature Review

WhatsApp could have beneficial as well as deleterious effects on learning. Baran (2010) cautions, "Technology is a double-edged sword." However, Baran concedes that technology's ultimate power resides in what users use it for. Yeboahand Ewur (2014), in a study of tertiary education students in five universities in Ghana, found out that only 7 percent of the respondents reported using WhatsApp for academic purposes. 72 percent used the medium for social chatting. The authors further observed that the more friends students had on the Whatsapp, the lower their academic performance. Their study therefore indicated that WhatsApp interferes rather than facilitates or complement learning.

Several studies have extolled the benefits of studying with mobile devices (Thornton & Houser, 2005; Cavus, & Ibrahim, 2008, Taki and Khazaei, 2011; Gooniband Shooshtari, Jalilifar, & Khazaie, 2013, & Alsaleem, 2014). Others who have attested to the positive and educational advantages of the WhatsApp, especially, when they are specifically harnessed for educational purposes include Rambe & Chipunza, 2013; Riyanto,

2013 (both cited by Abdul Fattah, 2015) Rambe & Chipunza, 2013; Riyanto, 2013; Calvo, Arbiol, & Iglesias, 2014; and Bouhnik, & Deshen, 2014).

In a related study, Rambe & Chipunza (2013) reported that students believed that WhatsApp provided opportunities for self-expression that would have been impossible during a lecture. Riyanto (2013) believes that besides WhatsApp facilitating social interaction among students and between students and teachers, it facilitates the learning of English.

Furthermore, Aburezeq, and Ishtaiwa (2013) investigated how pre-service Arabic teachers perceived the academic relevance of WhatsApp. They found that most of the participants believed that WhatsApp enhanced interaction among students, students' interaction with instructional contents, and encouraged interaction between students and teachers. A similar study used the independent t-test to compare an experimental group which did an online course via the WhatsApp and a control group that was taught the same content face to face. The result showed that the experimented group had a higher mean score (4.80) than the control group (3.80). Perhaps, the experimental group may have benefitted from the opportunity for personalized learning (Darmi & Albion, 2014)

WhatsApp also is credited with improving academic skills. It is found to enhance writing skills. (Abdul-Fattah, 2015). WhatsApp has, furthermore, been found to enhance content learning (Barhoumi, 2015). Similarly, Jafari & Chalak (2016) in a quasi-experimental study to assess the effectiveness of WhatsApp in Iranian junior high school students 'vocabulary learning, found that WhatsApp improved the vocabulary learning.

In addition, Nedungadi, Mulki, & Raman (2017) found that WhatsApp deployed in rural schools in India enhanced teacher effectiveness, students learning and reduced the effect of teacher and student absenteeism. Moreover, a qualitative study by Bouhnik and Deshen (2014) of two models of Whatsapp groups revealed that Whatsapp has educational benefits as it gives students access to educational materials. It was further observed that "WhatsApp can contribute to the interpersonal relationship between teacher and students. Students feel more comfortable about approaching their teachers."(p.227).

Learning opportunities may be offered without discrimination to students. However, access to such opportunities is often unequal because of certain factors. One of such factors that can hinder access to equal and equitable educational opportunities is economic. For instance a study by Oyeboade (2017) found a significant relationship between socioeconomic status of parents and undergraduates' use of social media.

Methodology

The present study is an action research. (Koshy, (2010) describes action research as "… a method used for improving practice. It involves action, evaluation, and critical reflection and – based on the evidence gathered – changes in practice are then implemented."This researcher considered this appropriate because the research wanted to evaluate his deployment of Whatsapp in teaching Use of English and Communication Skills in a Nigerian university. The result of the appraisal was intended to determine whether or not the practice could be retained, modified or stopped.

The researcher was assigned to teach Use of English and Communication Skills in the first semester of the 2016/2017 academic year. It is a two-credit hour course. But the actual contact with students was one hour in a week. There were 259 students in the class.

With the consent of the class, a WhatsApp group was formed by the author. The students nominated 12 representatives as administrators. This was to enable them to add their colleagues and classmates to the group. Thus, membership of the WhatsApp group was open to only members of the class. However, all were not added to the group at the same time. This was because some were not on WhatsApp when the group was formed initially. So, membership was progressive and continuous. The aim of the group was specified and published. Also, mutually agreed ground rules were posted. These were reposted from time to time because new members could not access earlier posts.

The lecturer used the group chat to post notes, downloaded materials, low megabyte videos and links to useful sites. The lecturer also used the forum to post questions and answer questions posed by the students. Students, also, shared relevant and, sometimes, "irrelevant" materials that were not strictly related to the course. Sometimes students posted information about social activities on campus, tutorial classes, and schedules for classes on other courses in their department. There were serious and light-hearted moments too. Censorship was very minimal, if any. Offensive materials and exchanges were forbidden, yet, they manifested occasionally. Social, political and even religious issues sometimes surfaced and were discussed, sometimes with the author's participation. The

whole essence was to encourage students to use English by making original compositions instead of merely copying-and-pasting or forwarding.

Near the middle of the semester, it was apparent that nearly half of the class members were not on the WhatsApp group. The author was worried that a sizeable portion of the class may have been deprived of the learning opportunities which interactions in the group might have offered. The need to find out why some students did not join the WhatsApp group and to find out how best to reach out to all the students warranted further action.

Questionnaire

A semi-structured questionnaire was prepared and administered to volunteers. The instrument had two sections. The first section sought information about students' units (whether in Anatomy or Radiography), sex, and frequency of using the WhatsApp, and whether or not the respondent owned a mobile phone. The second section required respondents to describe how useful the WhatsApp was to their study of English. The announcement about the questionnaire was made in class. The class was briefed that the aim was to find out how best to make the class more effective. Those who wanted to respond with the hard copies could get one in class or in the lecturer's office or through the class representatives. The questionnaire was also posted on the WhatsApp forum. But interested respondents were requested to inbox their responses to the lecturer individually.

The WhatsApp Focused Group Discussion

A focused group interview was conducted with participants who were enrolled in the WhatsApp group. An invitation was thrown to as many as would like to participate. The discussions were all done online using the WhatsApp chat. As Hammerchall (2016) believes, online asynchronous focused group interview using the WhatsApp could be an alternative to the traditional face-to-face focused group interview. Hammerchall, however, points out some of the challenges in the use of online asynchronous model such as the participants do not see one another, they may not know themselves, and nonverbal cues are lost. However, in the present study, the participants were not strangers. They were members of the same class. Profile pictures often show who a participant is. Yet, since the face-to-face contact was not possible, facial expressions and other nonverbal cues were indeed lost.

Ethical Considerations

The announcement about the questionnaire was made in class. The class was briefed that the aim was to find out how best to make the class more effective. They were informed that it was not an examination and would have no bearing on their assessment or examination scores (Examinations are conducted centrally). Their participation should, therefore, be strictly voluntary. They were further informed that findings may be used for publication. They were assured that their information would be used anonymously. Thus only pseudonym are used for participants.

Analysis and Results

The data were qualitative in nature. So, thematic analysis was used. Verbatim quotes of the participants were used to buttress identified themes.Such quotes are single-spaced, italicised and indented in this paper.

Research Question 1. What benefits do students derive from the WhatsApp group?

Data were retrieved from the responses of participants to the semi-structured questionnaire titled "WhatsApp Use Questionnaire" (WUQ). The responses were transcribed into Word Document. Then the transcript was read carefully to identify emergent themes. Two categories of benefits were identified. The categories and subthemes are presented in Fig. 1 :
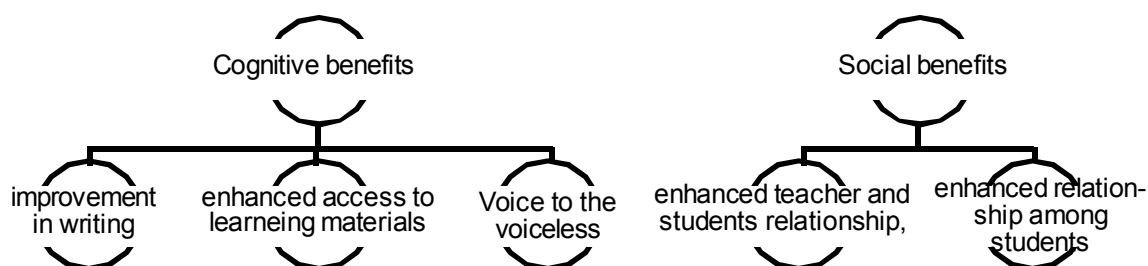

Figure 1

Benefits of participating in a WhatsApp group

Cognitive Benefits of WhatsApp

a. Improvement in Writing

Almost all participants emphasized that the group chat helped their written communication because they were expected to drop some of the abbreviated forms that are characteristic of the WhatsApp and other text messaging applications.

Unlike SMS applications, the Whatsapp does not limit the number of words or characters that could be used in a single conversation. Therefore, students are able to express themselves without restrictions. From the researcher's observations, elaborate original compositions that were up to 100 words long were rare. Only very few students posted original compositions of that length. Many students limited themselves to a few sentences or phrases, often laced with emojis.

However, students reported that since the group discouraged the use of non-standard abbreviations their writing had improved.

b. Access to Learning Materials

Another benefit mentioned by participants which they derived from the group was access to information relevant to their studies.

c. Voice to the Voiceless

The participants revealed that the group allowed students who may not have a chance to ask or answer questions in class to do so. This is understandable because the sheer size of the class, the restriction in time, and the fear that some students may have in expressing themselves in the public may effectively prevent them from making contributions in the class or even seeking clarifications. This finding agrees with the report of Rambe and Chipunza (2013) that "students felt

that WhatsApp gave them the possibility to express themselves freely in a non-restricted environment thus removing the low participation constraints characteristic of lectures" (p.334). However, there were instances when students would rather inbox the lecturer rather pose questions on the group. In such situations, if the lecturer believed the question would be of benefit to the entire group, the lecturer would ask the student if she wouldn't mind sharing her question with the group. Often, the 'recognition that the question was relevant would boost the confidence of the student to post the question on the group chat.

Social Benefits

a. Improved Relationship between Students and Lecturer and among the Students

Participants also acknowledged that participation in the WhatsApp group had some social benefits. For instance, they said that it facilitated a better relationship between students and the lecturer, and among students. Different excerpts from the transcripts of students' responses to the questionnaire have illustrated students' views.

The reason students valued closeness to the lecturer could be attributed to the large class size (259). It was difficult to interact with the students individually in a class that lasted but an hour per week. Only a few bold ones would have any opportunity for a one-on-one with the lecturer. Therefore, the group chat gave the participants an opportunity for at least a virtual interaction. This supports the views of Yeboah, and Ewur (2014), Amry (2014), Abdul-Fatah (2015),and Nedungadi, Mulki, and Raman (2017)who observed that the social media

like the whatsApp facilitates social interaction between students and teachers.

Research Question 2. What factors hinder access and participation in the WhatsApp Group?

To answer this question, a focused group interview was conducted with participants who were enrolled in the WhatsApp group. An invitation was given to as many as would like to participate. The discussions were all done online using the WhatsApp chat. Hammerchall (2016) believes that online asynchronous focused group interview using the WhatsApp, for example, could be an alternative to the traditional face-to-face focused group interview. Hammerchall, however, points out some of the challenges in the use of online asynchronous model are that participants do not see one another, may not know themselves, and nonverbal cues would be lost.

However, in the present study, the participants were not strangers. They were members of the same class. They called one another by name. Profile pictures, often, show who a participant is. Yet, since the face-to-face contact was not possible, facial expressions and other nonverbal cues were indeed lost.

To analyse the verbal data, the lecturer emailed the chats from his mobile phone to himself, downloaded it to a computer folder as Notepad. Then the chats were copied to a Word document. This will be referred to as the transcript. Using the Find-and-Replace facility on the computer, the names of the discussants were replaced with pseudonyms to maintain the anonymity of the participants.

The in-depth focused group interview was aimed at eliciting reasons why some students did not enrol in the WhatsApp group and why some of those who enrolled were not active. The transcript was read several times to identify themes and categorise them. The categories identified were:

I.   Economic constraints

II. Attitudinal
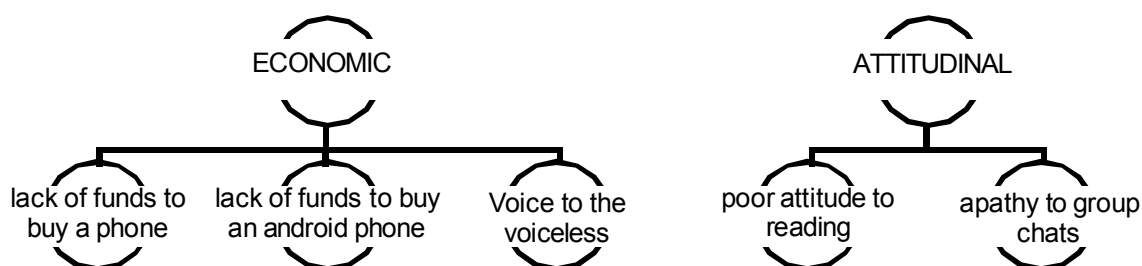
Figure 2

Constraints to participation in WhatsApp group

1.   Economic Constraints:

The discussants identified economic constraints as an inhibition to enrolment and participation in the WhatsApp group. This was the predominant reason for non-participation of some students in the WhatsApp group.

Even though some discussants complained that some parents did not buy phones for their children, it would appear that economic reasons may underlie parents' reluctance. For instance, Oyeboade (2017) noted that parents' capacity to provide money for their children to acquire mobile technology would determine students' access and use of those technologies.

The implication is that while some parents may not find it financially convenient to buy a phone for their children, they seem to also fear that the phones might be misused. Research supports such fears.(Ezeah, Asogwa & Edogor, 2013; Ahmad, 2011).

2.   Incompatible Phone

A related theme was incompatibility of phone. Participants suggested that some of their colleagues did not have Android phones. Some who had Android phones did not have the WhatsApp app installed on their phones. Android phones are more expensive than java phones. And some java phones may not have the capacity for the installation and operation of WhatsApp. Incompatibility of the phone seems to relate to economic factors. Android phones that have the capacity to WhatsApp are general more expensive than the java phones.

3.   Attitudinal

a.   Poor Attitude to Reading

One of the themes that occurred frequently in the focused group interview was that some students had generally poor attitude to reading and academic engagements generally.

b. Apathy to Chatting or Aversion to Written Composition:

Another theme that emerged from the discussion was disinterest in chatting. This was surprising because one would assume that young people would relish opportunities for chatting. However, the reason given was that some of the students find the group chat distracting as some students would post irrelevant materials.

Another possible reason for the negative attitude of some students to chatting on the platform may have been the restrictions on the use of nonconventional abbreviations. Perhaps, this may have hindered some students who may have developed much flare in the use of the cyber text that insiting on writing in full may have seemed discouraging. It is also possible that the fear of committing grammatical blunders may have deterred some students from even trying. So, such students may have watched from the sidelines without engaging in chats.

Conclusion

The study examined the perceived benefits of undergraduates in the University of Calabar Use of English class derived from belonging to the Whatsapp group set up to increase contact with the students. The group was used for academic purposes principally. But social chats were not forbidden. The lecturer and students representatives coadministered the group. The analysis of factors that determined enrolment in theWhatsAppp group isolated economic constraints, apathy to chatting, incompatibility of phone, and poor literacy habits. The benefited students believed that they got from participating in the group chat includ, increase access to the lecturer and lecture materials, opportunity for self expression, social interaction with lecturer and with colleagues, as well as improvement in writing and grammar.

Recommendations

Since this was an action research, the aim was to improve practice. Participants in the focused group discussion offered suggestions on how to increase participation and maximise the opportunities of online learning.

Many suggested to form Facebook group. One of the reasons for suggesting the Use of Facebook was that it was less discriminatory of type of phone than the WhatsApp. WhatsApp, according to the respondents, works mainly with android phone, whereas Facebook works with both Android and Java phones. Therefore, using Facebook was expected to increase students' participation and access. Thus, students who, for economic reasons, could not buy an android phone would not be excluded. In other words, using the Facebook would make the use of English class economically inclusive.

Furthermore, to reduce the economic burden of getting internet data, the university should make high speed wifi readily and consistently available and accessible to students. This would ensure that while students are on campus, they can freely access and use electronic resources.

In view of the grossly inadequate time allocated to use of English, it might be necessary to increase contact time to at least two hours per week. This will increase the time available to share knowledge with students and allow students to participate actively in class. But the one-hour-per-week class is likely to limit the delivery mode to lecture. Finally,

Government should implement policies that narrow the gap between the rich and the poor. This could be through job generation, and scholarship schemes for indiugent students. In addition, universities should emphasize entrepreneurial training where students can acquire entrepreneurial skills by which they become less dependent.

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Effectiveness of Polya's Heuristic Approach in Enhancing Problem Solving Ability in Mathematics

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C. C. Kurian

Abstract

Mathematics is useful in logical analysis, calculations and deductions. It develops the ability of imagination and trains us clear and logical thoughts. It is of great challenge to solve unsolved problems by using calculation and analyses skills. Students need deep Mathematical knowledge and general reasoning ability as well as heuristic strategies for solving non-routine problems. Problem solving is recognized as an important life skill involving a range of processes including analyzing, interpreting, reasoning, predicting, evaluating and reflecting. The present study attempts to measure the effectiveness of Polya's Heuristic Approach on the Problem Solving Ability in Mathematics of eighth standard students. For this the investigator adopted Quasi-Experimental method with pre-test post-test non-equivalent group design. The control group was taught through the prevailing method and experimental group was taught through Polya's Heuristic Approach. The study proved that Polya's Heuristic Approach is very effective for enhancing the Achievement in Mathematics irrespective of their gender.

Keywords : Polya's heuristic method, Problem solving method, Experimental group, Control group etc.

I. Introduction

The basic aim of education is to help each individual to progress towards the attainment of his full potential , both as an individual and as a member of the society. To achieve this objective different strategies are included in our school curriculum. Mathematics is one among them . The main objective of learning mathematics is to armour the learner with such knowledge which will help him to become a useful and efficient citizen of the society.

The importance of mathematics is of two fold, one it is helpful in the advancement of science and technology, and the other is that it helps us in understanding the working of the universe. For common people it is important for their personal development, both in the workplace and in mind calculations. Mathematics provides tools to the common men to understand the world and how they can change it. These tools include skills required for problem solving, logical reasoning, and the ability to think in various ways. Mathematics

is highly important in our daily life, in different forms of job, development in the field of science and technology, medical field, in our economy, environmental statistics or calculations and for making public decision.

Mathematics is all about structure and pattern: it is useful in logical analysis, calculations and deductions. Mathematics develops the ability of imagination. It trains us clear and logical thoughts. It is of great challenge to solve unsolved problems by using calculation and analyses skills. The study of mathematics can satisfy our wide range of interests. It also has a continuing drive to simplification, to seek the right concepts and techniques required for making difficult task easy.

Mathematics has been very liberally used and applied, in almost all aspects of human endeavor, with power and convenience. The Kothari commission draws the attention of the educators to the teaching of mathematics and the need for strengthening mathematics. Butler and Wren (1960) maintain that through the teaching of mathematics students attain higher intellectual and mathematical abilities like logical thinking, rational reasoning, concentration of mind, orderly presentation, precision and accuracy, analytical and inductive skills and above all general problem solving abilities. According to NCF(2005)The higher aim of mathematics is to develop the child's resources to think and reason mathematically, to pursue assumptions to their logical conclusion and to handle abstraction. It includes a way of doing things, and the ability and the attitude to formulate and solve problems.

Need and Significance of the Study

The purpose of school education in each country is, more or less, to develop independent, self-confident, critically thinking, motivated and multitalented individuals who will manage in different societal settings that they will encounter later on in their life. The key question is what kind of school instruction is optimal for this goal.

John Dewey argued that it was the job of education to encourage individuals to develop their full potential as human beings. According to him education, particularly schooling for all, would help to foster the physical, emotional and spiritual talents of everyone, as well as their intellectual abilities. Dewey was critical of the role learning of facts in schools, and argued for progressive teaching methods people should learn by experience by doing things rather than being hold. In this way they would not just gain knowledge but would also develop the skills, habits and attitudes necessary for them to solve a wide variety of problems.

Mathematical problem solving has occupied a very important place in teaching mathematics .Rosenbloom(1966)and Polya (1966) assert that the central activity of all teaching of mathematics is the development of problem-solving skills in the students. Collier and Lerch(1969) observe that the problem solving is a 'major force' in the growth of modern mathematics and Barnes (1959) stress that it should be 'major concern' of the school curriculum.

According to Polya(1957) " One of the first and foremost duties of the teacher is not to give his students the impression that mathematical problems have little connection with each other ; and no connection at all with anything else ….The teacher should encourage the students to imagine cases in which they could utilize again the procedure used , or apply the result obtained"(p.15-16)

Textbooks presented mathematics as a rigorously organized set of axioms followed by proofs of theorems derived from them. This gives students the wrong impression of how mathematics is actually done. When trying to solve a problem, develop a theory or prove a theorem, mathematicians try one approach after another, make numerous false starts, which may lead them down blind alleys ,have sudden flashes of intuition, lucky guesses, and so forth

Cognitive planning strategies, including explicit attention to problem solving strategies, give students tools for organizing their own thinking when solving mathematical problems. Considering the importance of problem solving ability , an experimental study was formulated with all its technical features to establish which method is resulting in better student performance in problem solving skills such as understanding the problem, analyzing into known elements, building relationships, hypothesizing and verifying solutions.

Objectives of the Study

1. To study the effectiveness of Polya's heuristic approach in enhancing the problem solving ability of 8th standard students.

2. To study the effectiveness of Polya's heuristic approach in enhancing the problem solving ability of 8th standard girl students.

3. To study the effectiveness of Polya's heuristic approach in enhancing the problem solving ability of 8th standard boy students.

4. To find out whether there is any significant difference between the means of scores of boys and girls of experimental group in problem solving.

Hypotheses of the Study

1. The gain scores of experimental group is significantly higher than that of control group.

2. The gain scores of girls of experimental group is significantly higher than that of control group.

3. The gain scores of boys of experimental group is significantly higher than that of control group.

4. There is a significant difference between boys and girls of experimental group on the means of scores of post-test.

Methodology in Brief

The study was intended to measure the effectiveness of Polya's Heuristic Approach on the Problem Solving Ability of eighth standard students. For this the investigator adopted Quasi-Experimental method. The investigator selected pre-test post-test non-equivalent group design. In Quasi-Experimental designs, random assignment of members to the experimental group and control group is not made but random selection of experimental group and control groups among the groups available is made. For this, from the two divisions of standard eight one division was selected as experimental group by random method .Pre test is conducted for both group .The control group was taught through the prevailing method and experimental group was taught through Polya's Heuristic Approach.

Analysis and Discussion

To study the effectiveness of Polya's Heuristic Approach in enhancing the Problem Solving Ability of 8th standard students, using the gain scores of experimental group and control group, the t-value was calculated. Its details are given in table 1.

Table 1

Mean, Standard Deviation, and 't' value of gain scores of Experimental group and Control group

Group	N	M	SD	t-value	Result
Experimental group	31	4.28	0.91	6.9	significant at level 0.01
Control group	31	3.1	0.65		

Table 1 shows that the mean of experimental group (4.28) is higher than that of the control group. The t-value calculated (6.9) is higher than the theoretical value at 0.01 level. This means that the gain scores of experimental group is significantly higher than that of the control group.

The second objective of the study was to find out the effectiveness of Polya's Heuristic Approach in enhancing the Problem Solving Ability of 8th standard girl students. For this the t-values of gain scores of girls of experimental group and control group was calculated. It is presented in table 2.

Table 2

Mean, Standard Deviation and t- value of gain scores of experimental group and control group of girls

Group	N	M	SD	t-value	Result
Experimental group	15	4.27	0.77	. 7.35	significant at 0.01 level
Control group	15	2.8	0.54		

Table 2 shows that the mean of experimental group (4.27) is higher than that of the control group (2.8) and the t- value 7.35 is greater than that of theoretical value at 0.01 level. It means that the gain scores of girls of experimental group is significantly higher than that of the control group.

To study the effectiveness of Polya's Heuristic Approach in enhancing the Problem Solving Ability of 8th standard boys the significance of difference the mean gain scores of boys of experimental group and control group was calculated and it is presented in table 3.

Table 3

Mean, Standard Deviation and t- value of gain scores of Experimental group and Control group of boys

Group	N	M	SD	t-value	Result
Experimental group	16	4.31	1.09	4.5	significant at 0.01 level
Control group	16	1.5	0.71		

Table 3 shows that the obtained t-value 4.5 is greater than that of theoretical value 2.46 at 0.01 level. It means that the gain scores of boys of experimental group is significantly higher than that of control group.

The fourth objective is to find out whether there is any significant difference between the means of scores boys and girls of experimental group in problem solving. For this the t-value of gain scores of boys and girls of experimental group was calculated. It is given in table 4.

Table 4

Mean, Standard Deviation and t-value of post test scores of boys and girls of experimental group

Experimental group	N	M	SD	t-value	Result
Boys	16	8	2.44	0.29	Not significant at 0.01 level
Girls	15	7.73	2.6		

As the t- value obtained (0.29) is less than the theoretical value 2.76 at 0.01 level, it is concluded that mean scores of Problem Solving in Mathematics of boys and girls belonging to experimental group do not differ significantly.

Major Finding of the Study

1. Polya's Heuristic Approach is effective among Eighth standard students to increase the Achievement in Mathematics.

2. The gain score of boys of experimental group is significantly higher than that of control group.

3. The instructional material based on Polya's Heuristic Approach is effective in the case of girls of standard Eighth.

5. The instructional material based on Polya's Heuristic Approach is effective in the case of boys of standard Eighth.

Educational Implication of the Study

The Investigator suggests the following implication based on the research findings.

1. Since it is already proved that Polya's Heuristic Approach is effective in teaching Mathematics, it can be adopted to teach other subjects to promote academic achievement.

2. The Polya's Heuristic Approach may also be introduced in schools for the teaching of Mathematics. For this teachers should train themselves to handle this strategy.

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