Contents

LUX AD ILLUMINANDUM

EFFECTIVENESS OF COMPUTER BASED CONCEPT MAPPING INSTRUCTIONAL STRATEGY ON ACHIEVEMENT IN BIOLOGICAL SCIENCE OF SECONDARY SCHOOL STUDENTS

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Abstract

The study was aimed at evaluating the effectiveness of Computer Based Concept Mapping Instructional Strategy and Conventional Strategy of teaching Biological Science in improving the Achievement of Secondary School Students. The Experimental Design used was pre-test post-test parallel group 2×2 factorial design. An Achievement test in Biological Science constructed by the Investigators and validated by experts was used to collect the data from the sample consisting of 72 students studying in standard Nine. Findings of this research revealed that: i) Computer-Based Concept Mapping Instructional Strategy is more effective than the conventional strategy in improving the Achievement of Secondary School Students. ii) Intellectually above-average students of experimental group performed better than the above-average students of control group in Achievement. iii) Intellectually below-average students of experimental group performed better than the below-average students of control group in Achievement.

Keywords: *Computer Based Concept Mapping Instructional Strategy, Achievement.*

INTRODUCTION

Science is a body of knowledge. The Scientific knowledge exists in the form of facts, concepts, principles, laws, hypotheses and theories. To acquire this scientific knowledge effective Instructional strategies need to be adopted. True learning is not merely acquisition of certain traits or skills; it is a change in behaviour brought about by training or experiences. This study attempts to provide unique learning experiences to students, to develop Concept Maps using technology for enhancing students learning outcomes in Science.

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Concept maps were developed in 1972 in the course of Joseph D. Novak's research program at Cornell University where he sought to follow and understand changes in children's knowledge of science. Concept maps are graphical tools for organizing and representing knowledge. They include concepts, usually enclosed in circles or boxes, and relationships between concepts indicated by a linking line. Words on the line referred to as linking words; specify the relationship between the two concepts.

Concept Mapping is an active, creative, visual and spatial learning activity. It is an effective method to gain a meaningful understanding of new concepts and to integrate these new concepts with prior knowledge retained in long-term memory. Concept Mapping is an educational tool that helps in Concept Attainment to organize knowledge and to structure it.

Modern technology has enabled us to improve the traditional Concept Mapping with the help of Computer as an aid in the process of concept mapping. Computer-Based Concept Mapping is an Instructional Strategy that helps the learners to organize information through visual aids. Computer-assisted concept mapping stimulates meta-cognitive awareness, leads the learners to organize concepts effectively and achieve meaningful learning. There are a number of Concept Mapping Software's available today. 'INSPIRATION' is one such Computer-assisted Concept Mapping Software used in the present study.

REVIEW OF RELATED LITERATURE

Asan, A. (2007) conducted a study on" Concept Mapping in Science Class: A Case Study of fifth grade students", in this study the Experimental group was given treatment through Inspiration computer based concept mapping tool. The findings revealed that, Concept Mapping has a noticeable impact on student achievement in science classes. Kwon, S. Y. (2007) conducted a study on "Using Computers to Individually-generate vs. Collaboratively-generate Concept Maps." The findings revealed that, the Students who individually generated concept maps scored more. Rao, M. P. (2004) conducted a study on "Effect of Concept Mapping in Science on Science Achievement, Cognitive Skills and Attitude of Students". The study revealed that, the experimental group students had performed better when compared to the control group on the achievement test. Chang, K.E., Sung, Y.T., & Chen, S.F. (2001) conducted a study on "Learning through computer-based Concept Mapping with scaffolding aid." The study revealed that, the 'construct-on-scaffold' had better effect for learning on biology. Royer, R. & Royer, J. (2004) conducted a study on "Comparing Hand Drawn and Computer Generated Concept Mapping." The results revealed that, the group using the computer, created more complex maps than the group that used paper/pencil.

From the synthesis of the reviewed studies it is observed that, Computer-Based Concept Mapping is undoubtedly an effective practice for enhancing

Achievement in Science and other subjects. But very little effort has been done to use Computer-Based Concept mapping in teaching Science Content, although the teachers were aware of the present trends in the teaching of Science.

OBJECTIVES

1. To study the effectiveness of Computer-Based Concept Mapping Instructional Strategy and Conventional Strategy in improving Achievement of Students in Science.

2. To study the effectiveness of Computer-Based Concept Mapping Instructional Strategy and Conventional Strategy in improving Achievement of Above- Average and Below- Average Intelligence level students.

HYPOTHESES

H₁: Computer-Based Concept Mapping Instructional Strategy is more effective than the Conventional Strategy of teaching in improving the Achievement of standard nine students in Science.

H₂: The Achievement in Science of above-average students of experimental group is more than the above-average students of control group.

H₃: The Achievement in Science of below-average students of experimental group is more than the below-average students of control group.

RESEARCH DESIGN

A pre-test post-test parallel group 2×2 factorial design was used in the study. This is diagrammatically represented in the Table 1.

Table1

Schematic Representation of Treatments and Levels

Levels → / Treatments ↓	Above Average (L1)	Below Average (L2)
Computer-Based Concept Mapping Instructional Strategy. (T1)	n(18) T1 L1	n(18) T1 L2
Conventional Strategy. (T2)	n(18) T2 L1	n(18) T2 L2

SAMPLE

The sample consisted of 72 students within the age group 14 to15 studying in Standard Nine. Based on their Intelligence 'T' Scores, matched pairs were identified and distributed into two groups as Experimental and Control group with 36 cases in each group. On the basis of their intelligence each group was further divided into 2 levels as Above- Average and Below- Average consisting of 18 cases in each group.

TOOLS USED

Standardized Intelligence test developed by J C Raven, was used for the classification of levels of students (Above-Average and Below-Average). The data for the present study was collected by using the Achievement test developed by the investigator. This test was constructed   on the basis of Cognitive domain of the Blooms taxonomy of Educational objectives and it consisted of 36 items selected through item analysis. The content validity was established by expert judgement. The coefficient of consistency by the split half method was found to be 0.89.

PROCEDURE OF THE STUDY

In order to avoid the inter-personal and intra personal variation of two different teachers for the student groups based on Computer-Based Concept Mapping instructional strategy and Conventional strategy, it was decided to conduct both the classes by a single teacher having competence in both the strategies on the same dates. The two groups were pre-tested on Achievement. The experimental treatment involved the teaching of a selected unit in Biological Science namely, "Classification of living organisms" for standard nine. Each lesson was of one and half hour duration. The total fifteen lessons were taught by using Computer-Based Concept mapping instructional strategy to the experimental group of students. Meanwhile, the students of Control group were taught the same lessons for the same duration of time by the same teacher using Conventional Strategy. Immediately after the completion of the treatment both the groups were Post- tested on Achievement.

⇒ *Instructional Strategy (Treatment)*

Table 2

Sum of Post-test scores of Experimental group and Post-test scores of Control group and 't' value with its significance on Achievement

(n=36)

Dependent Variable	ΣD	ΣD^2	Obtained 't' Value	Theoretical Value	Significance P<0.01
Achievement in Science	392	6032	9.2	2.72	Significant

Since the obtained 't' value (9.2) is more than the Theoretical 't' value (2.72) with df (35) at 0.01 level of significance the difference is significant.

DELIMITATIONS

•   Computer-Based Concept Mapping Instructional Strategy can be applied to any subject, at any level. In the present study, the background of the Researcher has enabled its application to Science at Secondary School level.

•   Computer-Based Concept Mapping Instructional Strategy can be applied for different types of instruction. In the present study, it is applied to Group instruction as it is suitable to the Indian context.

•   The study was confined to the teaching of Science for students of English medium of standard nine only.

•   Computer Based Concept Mapping Instructional Strategy involved the use of freely available software (trial version) namely 'INSPIRATION'.

RESULTS

The objectives and related hypotheses were analysed by applying 't' test. The results of the study are given below:

From the results of the above table it can be concluded that; The Computer Based Concept Mapping Instructional Strategy when compared to that of Conventional Strategy of teaching Science is significantly more effective in improving the Achievement in Science of standard Nine students.

⇒ *Students' Level (Above-Average and Below-Average)*

Table 3

Mean and Sum of Post-test scores of Above-Average and Below-Average students of Experimental group and Control group and 't' value with its significance on Achievement

Students Level	Mean		ΣD	ΣD^2	Obtained 't' Value	Theoretical Value	Significance P<0.01
	Experimental group	Control group					
Above Average	30.11	19.56	190	2708	4.54	2.90	Significant
Below Average	30.72	19.5	221	2891	5.56	2.90	Significant

• *Above-Average level*

Since the obtained 't' value (4.54) is more than the theoretical' value (2.90) with df (17) at 0.01 level of significance the difference is significant. The Above Average level of Experimental group has a mean score difference of (30.11–19.56=10.51) 10.51 units higher in comparison with the Control group. This indicates that the treatment given to the Experimental group led to better test scores on Achievement in Science.

Hence, the experimental treatment proved to be significantly more effective. Thus it can be concluded that: Intellectually above-average students of experimental group performed better than the above-average students of control group in Achievement in Science.

• *Below-Average level*

Since the obtained 't' value (5.56) is more than the Theoretical 't' value (2.90) with df (17) at 0.01 level of significance the difference is significant. The Below Average level of Experimental group has a mean score difference of (30.72–19.5=11.22) 11.22 units higher in comparison with the Control group.

This indicates that the treatment given to the Experimental group led to better test scores on Achievement.

Hence, the experimental treatment proved to be significantly more effective. Thus it can be concluded that: Intellectually below-average students of experimental group performed better than the below-average students of control group in Achievement in Science.

MAJOR FINDINGS

The major findings of the present study are as follows:

1. Computer-Based Concept Mapping Instructional Strategy is more effective than the conventional strategy in improving the Achievement in Science of standard nine students.

2. Intellectually above-average students taught through Concept Mapping Instructional Strategy showed significantly better Achievement in Science than the above-average students taught through Conventional Strategy.

3. Intellectually below-average students taught through Concept Mapping

Instructional Strategy showed significantly better Achievement in Science than the below-average students taught through Conventional Strategy.

CONCLUSION

Computer-Based Concept mapping instructional strategy helps the learners to organize information and stimulates learner's cognitive and meta-cognitive abilities. The present study has proved that Computer-Based Concept Mapping Instructional Strategy is more effective when compared to that of Conventional Strategy in improving Achievement in Science. This study has implications for student centric learning. It has been found to be a systematic strategy to improve classroom instruction across various disciplines and hence its inclusion in the teacher education curriculum will be a major step in making its application possible at the grass root level. The teachers of all levels need sufficient training to use Computer-Based Concept Mapping software's like 'Inspiration' to improve Achievement in their students. Efforts in this direction will surely bring in improvement in students performance.

References

Asan, A. (2007). Concept Mapping in Science Class: A Case Study of fifth grade students. Educational Technology & Society, 10(1), 186-195.

Chang, K.E., Sung, Y.T., and Chen, S.F. (2001). Learning through Computer-Based Concept Mapping with scaffolding aid. Journal of Computer Assisted Learning, 17, 21-33.

Best J. W. (1981), Research in Education , 4th Edition , New Delhi, Prentice Hall Of India Pvt. Ltd.

Kwon, S. Y., and Cifuentes, L. (2007).Using Computers to Individually-generate vs. Collaboratively-generate Concept Maps. Educational Technology and Society, 10 (4), 269-280.

Novak, J. D. (1990). Concept maps and vee diagrams: Two Metacognitive tools for science and mathematics education. Instructional Science, 19, 29-52.

Rao, M. P. (2004). Effect of Concept Mapping in Science on Science Achievement, Cognitive Skills and Attitude of Students. Indian Educational Abstracts 4(1).

Royer, R. and Royer, J. (2004). Comparing Hand Drawn and Computer Generated Concept Mapping. Journal of Computer s in Mathematics and Science Teaching, 23(1), 67-81. Norfolk, VA: AACE.

ORGANIZATIONAL STRUCTURE AND CLIMATE OF B.ED COLLEGES OF EDUCATION AS SOURCE OF OCCUPATIONAL STRESS FOR TEACHERS IN A.P STATE

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"A teacher affects eternity; she can never tell where her influence stops".
- Henry Adams

The present day teacher's roles and responsibilities are more dynamic and demanding a variety of knowledge, skills, positive attitudes and competences to train the younger generations of the nation. The role of teachers as agents of change in promoting understanding and tolerance, and improving the quality of education of learners cannot be over-emphasized. It necessitates demand for teachers who are professionally competent, responsible, and responsive to the needs of society; who are enthused with motivation, appropriate knowledge and skills; and who display a positive attitude towards life and other people; teachers who have personal characteristics of integrity and a kind of spiritual orientation to the young generations.

In this process, the teacher has to understand the organizational aims and goals in which he/ she is working, enhance his/ her personal and professional efficiency, develop intra and interpersonal relationships within himself, colleagues, students and parents. Further, he/she has to adjust with the environment in which he/ she is working apart for balancing home and work place. Whatever may the potentialities of the individual, the new emerging environments in education evoke lot of stress and strain in the teachers. Teaching like many other professions is progressively becoming a stressful occupation (Hepburn & Brown, 2001; Johnson et. al, 2005) as teachers have to shoulder multiple roles and responsibilities keeping in mind the deadlines. These roles may include as an assessor, planner, curriculum developer, information provider, role model, facilitator, and resource generator. The responsibilities may include planning lessons, effective teaching, class supervision, maintenance of discipline, evaluation,

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assessment and accountability of student performance or achievement, conducting co – curricular activities, etc. It is a well known fact that the organizational structure and climate of the colleges of the education plays a vital role in promoting job involvement in the teachers working in. The organization structural factors such as - role ambiguity, role conflict, role over-load and role under-load can be the potential causes of stress. Stressors that interfere with teacher efforts can be student apathy, student disruption or indiscipline, poor student attendance, low achievement, large number of students in a class, heavy paper or prep work, indifferent attitude of colleagues, obtrusive administrator, ineffective leadership of principals, denial of opportunities for professional development, low salary, unsatisfactory relationships with students, non involvement in decision making, accountability of student progress, fatigue, frustration, helplessness, stagnation, boredom, and loss of motivation or enthusiasm and unsupportive parents, etc. (Blase,1986; Travers & Cooper, 1996; Pithers & Sodon, 1998; Butt et al., 2005). All these stressors are various job conditions or compulsions that generally a teacher encounters while working in an institution and often they are uncertain in dealing with them. As a result, it leads to disinterest, negligence, bitterness, and absenteeism among teachers, the learning environment of the teacher gets affected and thus, prevents achievement of educational goals (Nagra, 2013).

Although some stress is a common and necessary element of life, excessive unmanaged stress has been linked to a long list of physical and mental health problems (Colbert, 2008; Sapolsky, 2005; Weil, 2005;

Wheeler, 2007). Chronic stress is typically measured through self-reporting methods, either in interviews or with survey instruments using checklists, scales, or open-ended questions in which participants document their perceived stress levels and stressors (Cohen, 2000). World all over, chronic stress is of great concern because it has been associated with a variety of health problems including muscle tension and pain, memory loss, suppression of the immune system, and even damage to the heart or other organs (Colbert, 2008; Larimore, 2003; Weil, 2005; Wheeler, 2007). In addition, Larimore (2003) explains that chronic stress can weaken the functioning of the adrenal system (the source of one of the energy producing hormones, adrenalin), resulting in decreased energy during the day and disrupted sleep at night. Left untreated, chronic stress can eventually lead to exhaustion, burnout, and serious physical or mental illnesses (Colbert, 2008; Wheeler, 2007).

There are different factors such as : organizational structure and climate, personal and professional efficiency of the teachers, intra and interpersonal relations within and among the teachers and students , environmental factors and home-work interface are some of the sources of occupational stress in teachers working at different levels of education (Reddy, 2006, 2011 and 2012), Reddy and Poornima (2009, 2012, 2012a and 2013), Reddy and Vijaya Anuradha (2013, 2013a, 2013b, 2013c and 2014). Studies on the organizational structure and climate of B.Ed colleges causing stress in teachers are not attempted much and the present study is an attempt in this direction.

Objectives of the Study

1. To develop a tool to assess the level of occupational stress of teachers due to organizational structure and climate of the B.Ed. colleges of education in A.P. State.

2. To find out the number and percentage of teachers with low, moderate and high levels of occupational stress, arising out of organizational structure and climate of the B.Ed. colleges of education.

3. To find out the significant differences, if any, in the occupational stress of B.Ed. college teachers due to variations in their gender, marital status, type of college working, location of the college, nature of job, years of experience ,average number of working hours per week, designation, age group, community, educational qualification and salary per month.

Hypothesis of the Study

There is significant difference in the occupational stress arising out of the organizational structure and climate of teachers working in B.Ed. colleges of education due to variation in their gender, marital status, type of college working, location of the college, nature of job, years of experience ,average number of working hours per week, designation, age group, community, educational qualification and salary per month.

Methodology used in the Study

Survey method is used in the study.

i)   Construction of Research Tools Used in the Study

For the purpose of the study, the investigator developed a organizational structure and climate rating scale to assess the occupational stress of B.Ed college teachers arising out of their colleges organizational structure and climate. The investigator went through various tools developed previously to assess the occupational stress and reviewed the literature to construct the statements.

The investigator referred to Organizational Climate Scale- OCS (Pethe et al. 2001),   Occupational Stress of Special Education Teachers Rating Scale (Reddy, 2006), Occupational Stress Rating Scale of Reddy (2006) adopted by Poornima (2010) and Anuradha (2012) to assess the occupational stress of special education teachers and higher secondary teachers respectively, and Occupational Stress Rating Scale developed by Reddy (2011) to assess the occupational stress of university teachers. From the review of research tools, it is understood that, a good number of tools are available to assess the occupational stress in teachers. But there is no specific tool to assess the occupational stress of teachers working in the B.Ed. colleges and thus the investigators developed their own Rating Scale to assess the Occupational Stress of teachers aroused out of the organizational structure and climate of the of B.Ed. colleges of education, in lines with the tool developed by Reddy (2011).

To develop the rating scale to assess the occupational stress of the B.Ed. College teachers arising out of organizational structure and climate (OSC) of the B.Ed colleges, the investigator constructed the statements to measure the sources of stress in B.Ed. college teachers due to OSC of the colleges. The available tools and the literature review

helped the investigator to develop the rating scale to assess the sources of stress among B.Ed. college teachers due to organizational structure and climate of the college. At the initial stage, a draft pool of 15 statements on the sources of occupational stress among B.Ed. college teachers was prepared. Care was taken to present the statements in a clear and concise form for better understanding. This rough draft pool of items was given to the panel of experts (psychologists, professionals and B.Ed. college teachers for a critical discussion on the sources of stress in teachers due to the organizational structure and climate of B.Ed colleges. Based on the discussion, the statements were further refined with the view to avoid ambiguity and repetitions. At the final stage, the organizational structure and climate rating scale encompasses 12 statements. These 12 statements represent the sources of stress experienced by B.Ed. college teachers arising out of the organizational factors like role overload, role ambiguity, role conflict, little or no participation in decision making, stringent rules and regulations, resource constraints and problematic instructional assignments and arrangements. To measure the occupational stress in B.Ed. college teachers arising out of organizational structure and climate of the college, against each statement five gradations are given namely Strongly Disagree (SD), Disagree (D), Undecided (UD), Agree (A), Strongly Agree (SA) having the scores 1,2,3,4 and 5 respectively.

ii) Pilot Study: A pilot study was carried out by the investigator to find out the suitability of the test items for the investigation. The pilot study aimed to find out the reliability and the validity of the rating scale used and developed in the study. The developed Rating Scale was administered to 36 B.Ed. college teachers (10 % of the total sample) randomly selected from the three regions (i.e. Costal Andhra, Rayalaseema and Telangana) of the United Andhra Pradesh State. The B.Ed. college teachers were oriented to rate the statements of the Rating to indicate their responses using the gradations/points. The completed Rating Scale were collected and statistically analyzed to establish the reliability of the research tools. Split half method is used to establish the reliability of the organizational structure and climate rating scale. The obtained half test (0.554) and whole test (0.713) reliability of the organizational structure and climate scale is high and hence, the rating scale used in this study possess high reliability indicating its suitability for the present investigation.

Validity of the Research Tools

According to Best (1989), validity is the quality of a data gathering instrument or procedure that enables it to measure what it is supposed to measure. The index of reliability is sometimes taken as a measure of validity (Garrett & Wordsworth, 1981). The content validity, face validity, intrinsic validity and criterion validity has been established through scientific procedures.

Locale and Sample of the Study

The locale of the study is the united Andhra Pradesh State of India. United A.P. State consists of three regions i.e. Telangana, Coastal Andhra Pradesh and Rayalaseema regions comprising of 23 districts. In Telangana region, there are 10 districts, Coastal Andhra Pradesh region 9 districts

and Rayalaseema region with 4 districts. In all the three regions, a good number of B.Ed. colleges are functioning.

For the purpose of the study, the investigator at the first stage selected 5 districts i.e. two from Telangana region (Hyderabad and Warangal Districts), two from Coastal Andhra Pradesh region (Guntur and Vishakhapatnam districts) and one from Rayalaseema region (Chitoor District) by using simple random sampling technique. In Hyderabad and Warangal districts 51 B.Ed. colleges, in Guntur and Vishakhapatnam districts 63 B.Ed. colleges and in Chittoor district 30 B.Ed. colleges are functioning. In all these five districts, University departments are offering B.Ed. course. For the purpose of the study, the investigator considered Government/ Aided and Private Colleges of Education and University departments of education (offering B.Ed. course) functioning in the above said districts. In each college on an average, there are 6 to 7 teachers working.

In the second stage, the investigator selected 11 B.Ed. colleges from each district by using simple random sampling technique considering Government, Aided and Private colleges. Thus, the total number of colleges selected is 55 (Telangana region - 22, Coastal Andhra Pradesh region- 22 and 11 in Rayalaseema region). In each college, there are about 6 to 7 teachers working either in permanent or temporary basis. All the teachers working in these colleges are the sample of the study. Accordingly, there are 148 teachers working in 22 B.Ed. Colleges of Education including University departments in Telangana region in the selected two districts i.e. Hyderabad and Warangal; 138 teachers working in 22 B.Ed.

colleges of education including University department in Coastal Andhra Pradesh region in the selected two districts i.e. Guntur and Vishakhapatnam; and 78 teachers working in the 11 B.Ed. colleges including University departments in Rayalaseema region of Chittoor District. Thus, the total sample of the study is 364 teachers working in B.Ed. colleges of education and University departments offering B.Ed. course, at the time of collection of data for the study.

Data Collection: The investigator personally visited the B.Ed. Colleges of Education to collect the data from the teachers and Principals working in those colleges. Good rapport was established with the Principals and teachers before administering the tools. They were explained about the purpose of the study. It was emphasized that the data will be kept confidential and will be used only for research purpose, and participants were instructed not to leave any item unrated.

Statistical Techniques Used in the Study: The collected data were analyzed by using appropriate statistical techniques such as number and percentage, mean, SD, mean ± 1SD, t-test, F-test.

Results and Discussion

Number and Percentage of Teachers with low, moderate and high levels of occupational stress due to Organizational Structure and Climate of the B.Ed colleges of education.

Table-1 shows the number and percentage of teachers experiencing low, moderate and high levels of occupation stress aroused out of organizational structure and climate of B.Ed. college.

Table-1

Number and Percentage of teachers with low, moderate and high levels of occupational stress due to organizational structure and climate of B.Ed. colleges.

Level of occupational	Number	%
Low (≤ Mean-1SD)	68	18.7
Moderate (In between)	225	61.8
High (≥ Mean+1SD)	71	19.5

Note: The number and percentage of teachers with low, moderate and high levels of occupational stress has been arrived based on mean ± 1sd for each item   for the sample of the study.

From table-I, it is observed that majority of the B.Ed. college teachers working in colleges of education experience moderate level of occupational stress due to organizational structure and climate of the college of education (61.8%) followed by 19.5 percent of teachers with high level of stress and 18.7% with low level of stress. From the above, it is concluded that, majority of the 81.3 percent of the B.Ed. college teachers are experiencing moderate and high levels of stress due to organizational structure and climate of the B.Ed colleges they are working. The results of the study by Ahgher (2008), and Rajeswari etc. all (2008) on school teachers; Reddy (2006) and Poornima (2011) on special education teachers; Vijaya Anuradha (2012) on higher secondary teachers; Kantarao (2010) on university teachers, are consistent with the present findings, where the majority of the respondents experience moderate and high levels occupational stress. From the above, it is inferred that, 81.3 percent of the teachers working in the Colleges of Education possess moderate and high levels of occupational stress indicating the need for creating appropriate organizational structure and climate to work comfortably.

One of the major objectives of the study is to find out the potential sources of stress in teachers. The potential sources of stress in B.Ed. college teachers may be due to organizational structure and climate. To know which aspects are causing more stress to the teachers working in the colleges of education, item/ aspect wise number and percentage of teachers with low, moderate and high levels of occupational stress has been worked-out and the same are presented in table-2.

Table-2

The Number and Percentage of Teachers with Low, Moderate and High Levels of Occupational Stress causing due to Organizational Structure and Climate of the B.Ed. colleges.

Sl. No.	Aspects of Organizational Structure and Climate	Number and Percentage of Teachers with Low, Moderate and High Levels of Occupational Stress					
		Low ≤ Mean-SD		Moderate In Between		High ≥ Mean + SD	
		No	%	No	%	No	%
1.	Long working hours and expectations to do more work	102	28.02	216	59.34	46	12.64

2. Carrying multiple responsibilities in a short span of time	68	18.68	207	56.87	89	24.45
3. Lack of information in carrying out the professional responsibilities	115	31.59	230	63.19	19	5.22
4. Working on assignments that are not necessary to the profession	86	23.63	242	66.48	36	9.89
5. Lack of equipments for teaching-learning process	58	15.93	241	66.21	65	17.86
6. Inadequate supportive staff in the college	124	34.07	178	48.90	62	17.03
7. Handling large class size with diverse needs	71	19.51	242	66.48	51	14.01
8. Lack of involvement of the teacher educators in the decision making process of the activities related to profession	63	17.31	208	57.14	93	25.55
9. Lack of opportunities for promotion and career development	80	21.98	227	62.36	57	15.66
10. Inadequate salary for the work done in the college	42	11.54	255	70.05	67	18.41
11. Stringent rules and regulations in B.Ed. College that hinders to act independently	54	14.84	260	71.43	50	13.74
12. Taking responsibility for the activities of others	56	15.38	267	73.35	41	11.26

From table-2, it is clear that, more than 75 percent of the teachers are experiencing moderate and high levels of occupational stress due to: carrying multiple responsibilities in short span of time (81.3%), working on assignments that are not necessary to profession (76.37%), lack of equipments for teaching learning process (84.07%), handling large class size with diverse needs (76.9%), lack of involvement of teacher educators in decision making process of the activities related to profession (82.69%), lack of opportunities for promotion and career development (78.02%), inadequate salary for the work done in the college (88.46%), stringent rules and regulation in B.Ed. college that hinders to act independently (85.17%) and taking responsibility for the activities of others (84.61%), under the dimension 'organizational structure and climate' of the college. In the remaining aspects (S.No.1, 3 and 6) 66% to 72% of teachers are experiencing occupational stress. This indicates the need to develop conducive organizational structure and climate of the colleges of education.

Sources and Level of Occupational Stress of B.Ed. College Teachers

To identify the level of occupational stress of teachers working in the colleges of education, mean and standard deviation for each item of the organizational structure and climate has been calculated for the whole sample of the teachers working at the colleges of the education. By using mean ± 1SD; the low, moderate and high level of stressor's have been identified and the same is presented in table-3.

It is a well known fact that the organizational structure and climate of the colleges of the education plays a vital role in promoting job involvement in the teachers working in. The organization structural factors such as - role ambiguity, role conflict, role over-load and role under-load can be the potential causes of stress. It is a well known fact that the organizational structure and climate of the colleges of the education plays a vital role in promoting job involvement in the teachers working in. The organization

structural factors such as - role ambiguity, role conflict, role over-load and role under-load can be the potential causes of stress. Other stressors include little or no participation in decisions making, stringent rules and regulations, poor communication channels, resource constrains, problematic instructional assignments and arrangement, an inadequate feedback about performance, restrictions on behaviour, relationships at work, career development i.e. lack of job security evoke occupational stress in teachers.

Table-3

Mean Occupational Stress Scores and the Level of Occupational Stress of Teachers on each aspect of organizational structure and climate of B.Ed. colleges they are working.

Sl. No.	Sources of Occupational Stress due to Organizational Structure and Climate	Mean O.S. Score	Level of O.S.
1	Long working hours and expectations to do more work	2.85	M S
2.	Carrying multiple responsibilities in a short span of time	3.18	H S
3.	Lack of information in carrying out the professional responsibilities	2.72	M S
4.	Working on assignments that are not necessary to the profession	2.83	M S
5.	Lack of equipments for teaching-learning process	3.28	H S
6.	Inadequate supportive staff in the college	2.59	M S
7.	Handling large class size with diverse needs	2.75	M S
8.	Lack of involvement of the teacher educators in the decision making process of the activities related to profession	3.43	H S
9.	Lack of opportunities for promotion and career development	2.94	M S
10.	Inadequate salary for the work done in the college	3.02	M S
11.	Stringent rules and regulations in B.Ed. College that hinders to act independently	2.89	M S
12.	Taking responsibility for the activities of others	3.27	H S

In table-3, it is clear that, carrying multiple responsibilities in short span of time (S. No.2), lack equipments for teaching learning process (S.No.5), lack involvement of teacher educators in decision making process of the activities related to profession

(S.No.8) and taking responsibility for the activities of the others (S.No.12) are the major sources of stress to the teachers under the dimensions organizational aspects. Similarly, long working hours and expectations to do more work (S.No.1), lack of information

in carrying out the professional responsibilities (S.No.3), working on assignments that are not necessary to profession (S.No.4), inadequate supportive staff on college (S.No.6), handling large class size with diverse needs (S.No.7), lack of opportunities for promotion and career development (S.No.9), in adequate salary for the work done in the college (S.No.10) and stringent rules and regulation in B.Ed. college that hinders to act independently are awaking moderate level of stress in the teachers. Surprisingly, all the aspects mentioned are causing high and moderate level of stress to the teachers, reflecting the poor organizational structure and climate of the colleges of education.

Effect of Independent variables (gender, marital status, type of college working…..) on occupational stress of teachers arising out of organizational structure and climate of B.Ed colleges.

In order to study the significance difference between two or more than two group of samples, differential studies are made. One of the major objectives of the study is to find out the significant differences, if any, in the B.Ed. college teachers occupational stress due variations in their independent variables. To know the significant differences, if any, in the occupational stress of B.Ed. college teachers due to variation in their gender, marital status, type of college working, location of the college , nature of job, years of experience, average number of working hours per week, designation, age group, community, educational qualification and salary per month; mean and SD has been calculated for each group in a variable. Based on the mean and SD's, t/ F-values have been worked out to know the significant differences in the occupational stress of the teachers, arising out of organizational structure and climate of the B.Ed. colleges.

Table- 4
Mean and Standard deviation of the occupational stress scores of teachers working in the colleges of education due to variations in their independent variables.

Variable	Groups	No.	Mean	SD	Cal. t/F-value
Gender	Men	201	36.66	5.83	
	Women	163	34.64	7.94	2.80**
Marital Status	Married	268	35.27	6.67	
	Unmarried	96	37.09	7.46	2.22*
Type of College	Govt. & Private Aided Colleges	186	34.83	7.17	
Working	Private Colleges	178	36.71	6.54	2.60**
Location of the	Urban	165	34.70	6.28	
College	Rural	199	36.63	7.31	2.67 **
Nature of Job	Permanent	93	35.78	6.79	
	Temporary	271	35.74	6.985	0.052@
Years of Experience	1-10 years below	242	34.66	6.62	
	11-20 years and above	122	37.92	7.02	4.33**

Average No. of Working Hours	14 hours and below	217	34.57	6.58	
	15 hours and above	147	37.50	7.07	4.00**
Designation	Assistant Professor	233	35.08	7.00	
	Associate Professor	131	36.95	6.65	2.48*
Age Groups	28-37 years	198	34.01	6.56	
	38-47 years	102	37.87	5.90	
	48-57 years	64	37.78	8.03	14.88**
Community	OC	128	36.17	8.07	
	BC	151	35.99	6.58	
	SC & ST	85	34.69	5.45	1.32@
Educational Qualifications	PG with M.Ed.	220	35.27	7.11	
	NET/ SLET	46	36.59	6.46	
	PG with M.Ed. & M.Phil.	26	36.15	6.54	
	PG with Ph.D.	72	36.54	6.75	0.91@
Regions of United Andhra Pradesh	Telangana	138	36.92	6.63	
	Rayalaseema	79	35.50	6.85	
	Coastal Andhra Pradesh	148	34.64	7.12	3.97*
Salary per month	Up to Rs. 10,000	106	34.41	5.91	
	Rs. 10,001 to 20,000	120	36.38	7.91	
	Rs. 20,001 to 30,000	39	37.26	7.21	
	Rs. 30,001 to 40,000	63	36.49	5.37	
	Rs. 40,001 and above	36	34.69	7.76	2.12@

*Note : * Significant at 0.05 level; ** Significant at 0.01 level; @ Not significant at 0.01 level*

In table-4, it is clear that, the t-values with respect to the variables gender (2.80), type of college working (2.60), location of the college (2.67), years of experience (4.33), average number of working hours (4.00) are significant at 0.01 level and; designation (2.48) and marital status (2.22) are significant at 0.05 level; the F-values for the variables age group (14.88) and regions of the United Andhra Pradesh (3.97) are significant at 0.01 and 0.05 level, respectively. It means, the variations in each of these variables are significantly influencing the B.Ed. College teachers' occupational stress caused due to organizational structure and climate of the B.Ed. colleges. Further, the mean values indicate that the men teachers (36.66), unmarried teachers (37.09), teachers working in the private B.Ed. colleges (36.71), teachers working in the colleges located in urban areas (36.63), teachers with 11-20 years and above experience (37.92), teachers working more than 15 hours and above (37.50) and Associate professors (36.95) are experiencing more stress than their counterparts i.e. women (34.64), married (35.27), teachers working in government & private aided colleges (34.83), teachers working in the colleges located in rural areas

(34.70), teachers with 1-10 years of experience (34.66), teachers working 14 hours and below (34.57) and Assistant professors (35.08), respectively. Similarly, teachers with higher age groups are experiencing more stress than their counterparts with younger age group. Teachers working in the B.Ed. colleges of Telangana region showed higher rates of occupational stress (36.92), followed by Rayalaseema region (35.50) and Coastal Andhra Pradesh region (34.64). On the other hand, the t/F-values with respect to the variables nature of job (0.052), community (1.32), educational qualification (0.91) and salary per month (2.12) are not significant indicating non-influence of the variations in each of these variables on the occupational stress of B.Ed. college teachers.

The results of the study indicates the need for providing conducive organizational structure and climate in the B.Ed. colleges in terms of assigning appropriate work, providing opportunities for professional enhancement, giving scope for the teachers to participate in the decision making process, giving rational salary based on the qualifications and so on. Further, there is a need to organize orientation programs to the teachers about the ways and means of competency building in prevention, avoidance and management of occupational stress, without sacrificing the quality of teacher training programs. There is a need to train the teachers on the importance of meditation, yoga, scheduling of their time effectively by giving adequate space for leisure activities like recreation, relaxation, sharing their thoughts, feelings and ideas with the colleagues in the college and outside the colleges of education. It means, it is not just passively absorbing the stress in the human body but expressing explicitly before the colleagues and in the work environment which make the other people to realize and react to find appropriate workable solutions to improve the work environment. In other sense, it is not the sympathetic outlook that finds solution to the problems but an empathetic bent of mind that promotes the other person to act more constructively in improving the organizational structure and climate of the B.Ed. colleges of education.

References

Ahghar, G. (2008) The role of school organizational climate in occupational stress among secondary school teachers in Tehran, International Journal of Occupational Medicine and Environmental Health, 21 (4), Pp.319-329.

Best, J.W. (1989) Research in education. Prentice Hall of India Pvt. Ltd: New Delhi.

Blase, J. (1986) A qualitative analysis of sources of teacher stress: Consequences for performance. American Educational Research Journal, 23 (1), Pp. 13-40.

Brock, B. L and Grady, M. L. (2002) Avoiding burnout: A principal's guide to keeping the fire alive. Thousand Oaks, CA: Corwin Press.

Butt, G., Lance, A., Fielding, A., Gunter, H., Rayner, S and Thomas, H. (2005) Teacher job satisfaction: lessons from the TSW pathfinder project, School Leadership and Management, 25 (5), Pp. 455-471

Colbert, D. (2008) Stress Less. Lake Mary, Florida: Siloam Publishers.

Combs, J., Edmonson, S. L., & Jackson, S. H. (2009) Burnout among elementary school principals, Journal of Scholarship and Practice, 5(4), 10-15.

Garrett, E.H and Woodsworth, R.S. (1981) Statistics in psychology and education. Vakkils, Feffer and Simons Ltd: Bombay.

Hepburn, A and Brown, S. (2001) Teacher stress and Management of Accountability, Human Relations, 54 (6), Pp.691-715.

Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P and Millet, C. (2005) The experience of work-related stress across occupations, Journal of Managerial Psychology, 20 (1/2), Pp.178-187.

Kanta Rao, P. (2010) Occupational stress of teachers working in Dravidian University, M.Ed. Dissertation, Dravidian University, Kuppam

Larimore, W. (2003) Ten essentials of highly healthy people. Grand Rapids, MI: Zondervan Publishing.

Nagra, V. (2013, August) Occupational Stress among Teacher Educators, Global Online Electronic International Interdisciplinary Research Journal, 2:2. Retrieved from http://goeiirj.com/upload/aug2013/3.pdf

Pethe, S., Chaudhari, S and Dhar, U. (2001) Manual for Organizational Climate Scale. National Psychological Corporation: Agra.

Pithers, R. T and Soden, R. (1998) Scottish and Australian Teacher Stress and Strain: A Comparative Study, British Journal of Educational Psychology, 68, Pp 269-279.

Poornima, R. (2010) Emotional Intelligence, occupational stress and job satisfaction of special education teachers, Ph.D. Thesis, Dept. of Education, Dravidian University, Kuppam.

Poornima, R. and Reddy, G.L. (2012) Occupational Stress and Professional Burnout of University Teachers in South India, International Journal of Educational Planning and Administration, 2(2), Dec., Pp.109-124.

Rajeswari, S.M., Santhanam, T., Babu, B.P and Rao, D.B. (2008) Stress and attitude of women teachers. Discovery Publishing House: New Delhi.

Reddy, G.L. (2006) Occupational stress, professional burnout and job satisfaction among special education teachers in South India, Major Research Project MHRD, Govt. of India, Dept. of Education, Dravidian University, Kuppam.

Reddy, G.L. (2011) Occupational stress, professional burnout and job satisfaction of university teachers in South India, UGC Major Research Project, Dept. of Education, Dravidian University, Kuppam.

Reddy, G.L and Poornima, R. (2009) A study on occupational stress of teachers working in the special schools for visually impaired children, Disabilities and Impairment, 23 (1), Pp.7-18.

Reddy, G.L and Poornima, R. (2012) Occupational stress and professional burnout of university teachers in South India, International Journal of Educational Planning and Administration, 2 (2), July-December, Pp.109-124.

Reddy, G.L and Poornima, R. (2012a) Professional burnout of university teachers in South India, Edu Tracks: A Monthly Scanner of Trends in Education, 12 (2), October, Pp.14-20.

Reddy, G.L and Poornima, R. (2013) Occupational stress of university teachers, Innovative Thoughts: an

International Research Journal, 1 (2), October, Pp.2-15.

Reddy, G.L and Vijaya Anuradha, R. (2013) Emotional Intelligence, Occupational Stress and Job Performance of Higher Secondary Teacher: A Correlation Study, Journal of Edu Tracks, 12 (06), February, Pp.15-24.

Reddy, G.L and Vijaya Anuradha, R. (2013a) Emotional Intelligence and Occupational stress of higher secondary school teachers: A correlation study. Journal of Pedagogics, 10 & 11 (1), Sept, Pp.6-11.

Reddy, G.L and Vijaya Anuradha, R. (2013b) Occupational Stress of Higher Secondary Teachers Working in Vellore District. International Journal of Educational Planning and Administration, 3 (1), March, Pp. 9-24.   Available online:http://www.ripublications.com//ijepa.htm.

Reddy, G.L and Vijaya Anuradha, R. (2013c) Organizational Structure & Climate as Source of Stress for Teachers. Educational Extracts, 1 (1), Jan, Pp.5-18

Reddy, G.L and Vijaya Anuradha, R. (2014) Occupational Stress and Job Performance of Higher Secondary Teachers. Indian Journal of Psychometry and Education – An Interdisciplinary Peer Reviewed Research Journal, 44 (1), Jan, Pp.37-43.

Slavin, R.E. (1987) Small group methods, in M.J. Dunkin (Eds.) The international encyclopedia of teaching and teacher education, pp. 237-243. Pergamum: Oxford.

Sapolsky, R. M. (2004) Why zebras don't get ulcers. New York: Holt Inc.

Traverse, C.J and Cooper, C.L. (1996) Teachers under pressure: Stress in the teaching profession. Routledge: London.

Vijaya Anuradha, R (2012) Emotional Intelligence, Occupational Stress and Job Performance of Teachers working at Higher Secondary Level, Ph.D. thesis, Dravidian University, Kuppam.

Weil, A. (2007) Healthy Aging. New York: Random House, Inc.

Wheeler, C. M. (2007) Ten simple solutions to stress: How to tame tension and start enjoying your life. Oakland, CA: New Harbinger Publications.

SELF CONCEPT AS A CORRELATE OF JOB INVOLVEMENT AMONG SECONDARY SCHOOL TEACHERS

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Abstract

The study intends to find out the relationship between self concept and job involvement among secondary school teachers in Palakkad district. The sample for the present study consisted of 400 secondary school teachers working in schools of government, aided and unaided sectors. The investigator used two tools to collect data-A self concept scale and job involvement scale for teachers. The study reveals that secondary school teachers possess moderate level of self concept and job involvement. The self concept among teachers with respect to gender and locale do not differ significantly. The job involvement among secondary school teachers do not differ significantly with respect to gender and locale. Findings of correlation revealed a positive correlation between self concept and job involvement for the total sample and sub samples. The study points out to the need of improving the self concept and job involvement of secondary school teachers.

Keywords : *Self concept, Job involvement, Secondary School Teachers, etc.*

INTRODUCTION

Education has got prime importance in determining the future of our nation. It is considered as a man making process for the progress of individual as well as for the nation. So it is necessary to ensure that everyone should get quality education irrespective of their socio economic status.

Teacher's performance is the most crucial input in education since teachers plays an important role in moulding the personality of a child. Teacher is the person who keeps the lamp of civilization burning and shining.

The quality of education depends on the quality of teachers. The quality of a teacher is determined by his personality factors. Goldenson (1970) contends that an individual's self concept is considered as one of the basic and crucial component of his personality. Teachers with proper self concept can only identify their abilities and drawback. So that they can make

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appropriate measures to make their effort maximum. Creemers (1994) argues that students academic outcomes are more heavily dependent on the procedure and activities carried out in the classroom. Teachers require proper self-concept to make their class room suitable for teaching learning. Teachers have to perform various roles like a teacher, friend, counselor, etc. So teachers should have a balanced, proper self concept then only they can guide their students. Oser and Partry (1992) found that learning and progress cannot be achieved without effective teachers. When teaching is a sharing of self with others it is vital to have teachers with positive self concept to create productive and supportive environment to enhance the achievement in students. As teachers duty is to maximize the educational outcome teachers with good self concept are most favoured. Burn (1984) asserted that teachers with proper self concept has positive attitude towards students.

Teachers with favaourable self concept have a good degree of professional adjustment. Khatry (1973) found out a significant relationship between self concept and professional adjustment among teachers. Ackley et al (1999) found that healthy self concept among teachers had profound positive impact on the attitude, beliefs and finally on teaching success.

Positive self concept in teachers facilitate not only themselves as effective teachers but also pupil as effective learners with self esteem and performance. Teachers self concept is considered as the major determinants in attitude towards their job involvement. Teachers self concept has profound effects on students' academic achievement, attitude towards their teaching job, interpersonal, relationships, adjustment. Teachers with positive self concept are found to be successful in their life.

Job involvement of teachers refers to the degree to which they are involved in their teaching job. The job involved teachers differs from their colleagues in several ways. The teachers who are more involved in their jobs are more likely to show better performance, ready to take up new responsibility, and attain excellence in everything they do. The main determinants of job involvement among teachers are found to be personal psychological variable, job circumstance variables and family characteristic variable. Among the three factors personal psychological and job characteristics are found to be more relevant. The study intends to find out the relationship between self concept and job involvement among secondary school teachers in Palakkad district.

OBJECTIVES OF THE STUDY

The main objectives of the study are:-
1. To find out the self concept among secondary school teachers.
2. To find out the job involvement among secondary school teachers.
3. To find out whether there is any significant difference in self concept among secondary school teachers for the sub samples classified on the basis of (a) Gender, (b) Locale.
4. To find out whether there is any significant difference in job involvement among secondary school teachers for the sub samples classified on the basis of (a) Gender, (b) Locale.

5.   To find out whether there is any significant relationship between self concept and job involvement among secondary school teachers for the total sample and sub sample classified on the basis of (a) Gender, (b) Locale.

6.   To find out whether there is any significant difference in relationship between self concept and job involvement among secondary school teachers for the sub sample classified on the basis of (a) Gender, (b) Locale.

HYPOTHESES OF THE STUDY

The main hypotheses of the study are:-

1.   The self concept among secondary school teachers is comparatively high.

2.   The job involvement among secondary school teacher is comparatively high.

3.   There exists a significant difference in self concept among secondary school teachers for the sub sample classified on the basis of (a) Gender, (b) Locale.

4.   There exists a significant difference in job involvement among secondary school teachers for the sub sample classified on the basis of (a) Gender, (b) Locale.

5.   There exists a significant relationship between self concept and job involvement among secondary school teachers for the total sample and sub sample classified on the basis of (a) Gender, (b) Locale.

6.   There exists a significant difference in relationship between self concept and job involvement among secondary school teachers for the sub sample classified on the basis of (a) Gender, (b) Locale.

METHODOLOGY

The methodology of the present study is described under the following headings.

Method

Survey method is used to collect data.

Sample

The present study was conducted on a final sample of four hundred secondary school teachers, working in schools of government, aided and unaided sectors. The sample for the present study was drawn by stratified random sampling techniques.

Tools

The investigator used the following tools to measure the variables.

•   Self concept scale for teachers developed by Dr. Kamala. S. Pillai (1989).

•   Job involvement scale for teachers, which constituted of 59 statements, on 14 dimensions of job involvement such as; Locus of control, Work role salience, Need for achievement, anatomy, Work commitment, Work challenge, Leader behaviour, Job satisfaction, Organisational support, Role of ambiguity, Skill variety, Infrastructure facility, Spouse support, Parental demands.

Scoring

The score scheme adopted for the job involvement is as follows. The scoring for the positive statements was done as 5, 4, 3, 2, 1 respectively for the responses strongly agree, agree undecided, disagree, and strongly disagree. For the negative

statements it was done as 1, 2, 3, 4, 5 respectively for marking strongly agree, agree, undecided, disagree and strongly disagree. Subjects were asked to put 'x' in the appropriate alternative with which they agree.

Statistical Techniques Used

1. Percentage analysis
2. Two tailed test of significance of difference between means for large independent sample.

3. Karl Pearson's product moment co-efficient of correlation.
4. Test of significance of 'r' using 't' test.
5. Test of significance of difference between two 'r' s.

Results and Discussion

Classification of secondary school teachers according to their level of self concept is given table 1. The table also contains the number and percentage of teachers with different levels of self concept.

Table 1

Percentage Analysis of the Variable Self Concept among Teachers for the Total Sample

Sl. No.	Groups	N	Percent
1.	High Level of Self Concept	140	35.00
2.	Average Level of Self Concept	148	37.00
3.	Low Level of Self Concept	112	28.00

Discussion of Results

Table 1 indicates that in the total sample of 400 secondary school teachers 28 percent of teachers have high level of self concept, 37 percent of teachers have average level of self concept and 35 percent of teachers have low level of self concept.   From this data it can be concluded that most of the teachers fall in the category of average level of self concept.

Classification of secondary school teachers according to their level of job involvement is given table 2. The table also contains the number and percentage of teachers with different levels of job involvement.

Table 2

Percentage analysis of the Variable Job Involvement among Teachers for the Total Sample

Sl. No.	Groups	N	Percent
1.	High Level of Job Involvement	141	35.25
2.	Average Level of Job Involvement	142	35.50
3.	Low Level of Job Involvement	117	29.25

Discussion of Results

Data in the Table 2 suggests that in the total sample of 400 secondary school teachers 35.25 percent are with high level of job involvement, 35.50 percent are with average level of job involvement and 29.25 percent are with low level of job involvement. From this data it can be concluded that most of the teachers fall in the category of average level of job involvement.

To find out whether there is any significance in self concept among secondary school teachers for sub samples classified on the basis of gender, 't' test was used and the result is shown in table 3.

Table 3

Data and Results of Test of Significance of Mean Difference in Self Concept among Male and Female Teachers

Sl. No.	Sample	N	Mean	Standard Deviation	Critical Ratio
1.	Male	184	65.641	14.260	0.83
2.	Female	216	64.426	14.830	

Discussion of Results

The critical ratio obtained for mean difference in self concept among female and male teachers is not significant at 0.05 level since the calculated 't' value (0.83) is less than the table value of 't' (1.96). Thus it may be concluded that there is no significant difference in self concept among secondary school teachers with respect to gender.

This may be due to the fact that mean and women are getting equal opportunities in all the fields, irrespective of gender difference. Moreover nowadays number of women going for higher education is increasing than that of men. Thus it can be said that the development of self concept among individuals with respect of gender is on the same level. Present study also reveals that there exists no significant difference in self concept among male and female teachers.

To find out whether there is any significance in self concept among secondary school teachers for sub samples classified on the basis of locale, 't' test was used and the result is shown in table 4.

Table 4

Data and Results of Test of Significance of Mean Difference in Self Concept among Teachers of Rural and Urban Areas

Sl. No.	Sample	N	Mean	Standard Deviation	Critical Ratio
1.	Male	205	65.029	14.310	0.06
2.	Female	195	64.939	14.866	

Discussion of Results

The critical ratio obtained for mean difference in self concept among teachers of rural and urban areas is not significant at 0.05 level since the calculated 't' value (0.06) is less than the value set for significance at 0.05 level of significance of test. Thus it may be concluded that there is no significant difference in self concept among secondary school teachers with respect to locale.

It may be due to the fact that contributory factors in rural and urban areas may be almost same in all aspects. So the teachers of rural and urban area will be getting equal exposure.

To find out whether there is any significance in job involvement among secondary school teachers for sub samples classified on the basis of gender, 't' test was used and the result is shown in table 5.

Table 5

Data and Results of Test of Significance of Mean Difference in Job Involvement among Male and Female Teachers

Sl. No.	Sample	N	Mean	Standard Deviation	Critical Ratio
1.	Male	184	221.408	17.522	1.90
2.	Female	216	224.857	18.504	

Discussion of Results

The critical ratio obtained for mean difference in job involvement scores obtained among male and female teacher is not significant at 0.05 level since the calculated 't' value is less than the table value of 't' (1.96). Thus it may be concluded that there is no significant difference in job involvement among male and female teachers.

The mean score obtained for job involvement among male and female teachers reveals that females teachers are found to be more involved than male teachers. It may be due to the reason that male teachers may not be satisfied with the working conditions and have less job satisfaction. They may have more expectations than that of female teachers.

To find out whether there is any significance in job involvement among secondary school teachers for sub samples classified on the basis of locale, 't' test was used and the result is shown in table 6.

Table 6

Data and Results of Test of Significance of Mean Difference in Job Involvement among Teachers of Rural and Urban Areas

Sl. No.	Sample	N	Mean	Standard Deviation	Critical Ratio
1.	Rural	205	224.039	17.313	0.87
2.	Urban	195	225.462	18.940	

Discussion of Results

The critical ratio obtained for mean difference in job involvement among teachers of rural and urban area is not significant at 0.05 level since the calculated 't' value (0.87) is less than the table value of 't' (1.96). Thus it may be concluded that there is no significant difference in job involvement among secondary school teachers with respect to locale.

Results reveal that teachers of rural and urban areas give equal importance to their jobs. The working conditions that they are getting in schools situated in both areas may be more or less same.

To find out whether there exists a significant relationship between self concept and job involvement among secondary school teachers for the total sample and sub samples

classified on the basis of gender co-efficient of correlation (r) was found that the result is presented in table 7.

Table 7

Data and Results of the Relationship between Self Concept and Job Involvement for the Total Sample

Sl. No.	Sample	N	'r'	't'
1.	Total Sample	400	0.413	4.35**

*** Correlation significant at 0.01 and 0.05 level*

Discussion of Results

Table 7 reveals that for the total sample the correlation between self concept and job involvement among secondary school teachers is found to be 0.413. This shows that there is positive relationship between these two variables.

The positive value of 'r' indicates that any increase in the value of self concept will result in an increase in the value of job involvement. The test of significance for 'r' is also found out. Since the 't' value obtained (4.35) is greater than 2.58 required for significance at 0.01 level, the 'r' is found to be significant.

The relationship between self concept and job involvement among male teachers was found out by using the Karl Pearson's Product Moment Co-efficient of Correlation. The details of the analysis are presented in table 8.

Table 8

Data and Results of the Relationship between Self Concept and Job Involvement among Male Teachers of Secondary Schools

Sl. No.	Sample	N	'r'	't'
1.	Male	184	0.259	3.63 **

*** Correlation significant at 0.01 and 0.05 level*

Discussion of Results

Table 8 reveals that the correlation between self concept and job involvement among male teachers of secondary school is found to be 0.259. This shows that there is positive relationship between these two variables.

The positive value of 'r' indicates that any increase in the value of self concept will result in an increase in the value of job involvement. The test of significance for 'r' is also found out. Since the 't' value obtained (3.63) is greater than 2.58 required for significance at 0.01 level, the 'r' is found to be significant.

The relationship between self concept and job involvement among male teachers was found out by using the Karl Pearson's Product Moment Co-efficient of Correlation. The details of the analysis are presented in table 9.

Table 9

Data and Results of the Relationship between Self Concept and Job Involvement among Female Teachers of Secondary Schools

Sl. No.	Sample	N	'r'	't'
1.	Female	216	0.172	38.08 **

*** Correlation significant at 0.01 and 0.05 level*

Discussion of Results

Table 9 reveals that the correlation between self concept and job involvement among secondary school female teachers is found to be 0.172. This shows that there is positive relationship between these two variables.

The positive value of 'r' indicates that any increase in the value of self concept will result in an increase in the value of job involvement. The test of significance for 'r' is also found out. Since the 't' value obtained (38.08) is greater than 2.58 required for significance at 0.01 level, the 'r' is found to be significant.

The relationship between self concept and job involvement among secondary school teachers of rural area found out by using the Karl Pearson's Product Moment Co-efficient of Correlation. The details of the analysis are presented in Table 10.

Table 10

Data and Results of the Relationship between Self Concept and Job Involvement among Teachers of Rural Area

Sl. No.	Sample	N	'r'	't'
1.	Rural	205	0.851	22.82 **

** *Correlation significant at 0.01 and 0.05 level*

Discussion of Results

Table 10 reveals that the correlation between self concept and job involvement among secondary school female teachers is found to be 0.851. This shows that there is positive relationship between these two variables.

The positive value of 'r' indicates that any increase in the value of self concept will result in an increase in the value of job involvement. The test of significance for 'r' is also found out. Since the 't' value obtained (22.82) is greater than 2.58 required for significance at 0.01 level, the 'r' is found to be significant.

The relationship between self concept and job involvement among secondary school teachers of urban area found out by using the Karl Pearson's Product Moment Co-efficient of correlation. The details of the analysis are presented in Table 11.

Table 11

Data and Results of the Relationship between Self Concept and Job Involvement among Teachers of Urban Area

Sl. No.	Sample	N	'r'	't'
1.	Urban	195	0.484	7.6**

** *Correlation significant at 0.01 and 0.05 level*

Discussion of Results

Table 11 reveals that the correlation between self concept and job involvement among secondary school teachers of urban area is found to be 0.484. This shows that there is positive relationship between these two variables.

The positive value of 'r' indicates that any increase in the value of self concept will result in a increase in the value of job involvement. The test of significance for 'r' is also found out. Since the 't' value obtained (7.6) is greater than 2.58 required for significance at 0.01 level, the 'r' is found to be significant.

To test whether there is exists a significant difference in relationship between self concept and job involvement among secondary school teachers for the sub samples classified on the basis of gender, test of significance of difference in 'r' is used test of significance of difference in 'r' of self concept and job involvement among teachers

with respect to gender is found out and the results are presented in the Table 12.

Table 12

Data and Results of Test of Significance of Difference in 'r' of Self Concept and Job Involvement among Teachers with respect to Gender

Sl. No.	Sample	N	'r'	Critical Ratio
1.	Male	89	0.259	1.00
2.	Female	216	0.172	

Discussion of Results

The Table 12 reveals that the difference in correlation between self concept and job involvement among male and female teachers is not significant at 0.01 level since the critical ratio (1.00) is less than the table value of (1.96). Thus it can be said that male and female teachers do not differ significantly in their relationship between self concept and job involvement.

Test of significance of difference in 'r' is used to compare the difference in 'r' of self concept and job involvement among teachers of rural and urban areas.   The results are presented in Table 13.

Table 13

Data and Results of Test of Significance of Difference in 'r' of Self Concept and Job Involvement among Teachers of Rural and Urban Areas

Sl. No.	Sample	N	'r'	Critical Ratio
1.	Rural	205	0.85	7.4 **
2.	Urban	195	0.48	

*** Indicates significance at 0.01 and 0.05 level.*

Discussion of Results

The table 13 revels that the difference in correlation between self concept and job involvement among teachers of urban and urban is significant at 0.01 level since the critical ratio (7.4) is greater than the table value of (1.96).   Thus it can be said that teachers differ significantly in their relationship between self concept and job involvement.

CONCLUSION

The study reveals that secondary school teachers possess moderate level of self concept and job involvement. The self concept among teachers with respect to gender and locale do not differ significantly. The job involvement among secondary school teachers do not differ significantly with respect to gender and locale. Findings of correlation revealed a positive correlation between self concept and job involvement for the total sample and sub samples. In the case of rural and urban sample a significant positive correlation is found out. The finding also reveals significant difference in relationship between self concept and job involvement among rural and urban samples.

EDUCATIONAL IMPLICATIONS

The result of the present study revealed that self concept plays a dominant role in determining the job involvement of secondary school teachers.

In the emerging new trends in the field of education the need for developing proper self concept among secondary school teachers is of prime importance. Teachers will develop a sense of commitment only if they are fully involved in their job, which will

improve the standard of education. Some of the educational implications of this study are the following:

- The study points out in the need for developing proper self concept in secondary school teachers.

- The study will make a self awareness among teachers about the need for improving their own self concept and job involvement for enhancing their teaching ability.

- The findings lead to the necessity of considering the self concept level of teachers while conducting the orientation and teachers development programmes.

- The findings of the study lead to the necessity of encouraging teachers to involve more in their job by developing a sense of commitment.

- The study points out the need for devising methods for enhancing teacher commitment.

- The study points out the need for integrating strategies and techniques in pre-service and in-service education so as to develop proper self concept and commitment among teachers towards teaching job.

REFERENCES

Allport, G. (1943). The ego in contemporary psychology, Psychological Review, 50, 451-476.

Aminabhavi, V.A and Dhavanendriah, A.S (1997). A study of factors contributing to job involvement, Indian Journal of Psychometry and Education. 28(2), 109-112.

Burns, R.B. (1984). The self concept, theory, measurement and behaviour, (3rd impression). London and New York : Longman.

Creemer (1994). Generating Criteria for Measuring Teacher effectiveness through self evaluation approach : A complementary way of measuring teacher effectiveness. In Kyriakides, R.J. Camp bell, and E.Christ Fidou (2002). School Effectiveness and School Improvement. Vol. 13, No. 3, pp. 291-325.

Goldenson, R.M (1970). The Encyclopedia of Human Behaviour Psychology, Psychiatry and Mental Health. Vol. 2, 1100, New York : Doubleday.

Khatry, P.P (1973). A comparative study of the self concept of teachers of different categories and the relationship of their self concept with professionally adjustment. Doctoral thesis, Punjab University.

Oser, F.K, Dick, A. and Patry, J.L. (1992). Effective and responsible teaching. New York : Macmillan.

SPATIAL THINKING SKILLS AND ACHIEVEMENT IN MATHEMATICS AMONG SECONDARY SCHOOL STUDENTS

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Abstract

Spatial intelligence is the ability to visualize spatial patterns and mentally manipulate them over a time-ordered sequence of spatial transformations. Mathematics is regarded as the mother of all sciences. The present study aims to assess the Spatial Thinking Skills and Academic Achievement of the Students of Standard Nine. Survey method was used for the study. The study was conducted on a random sample of 402 Students of Standard Nine. The major finding of the study was that Most of the students have Average Spatial Thinking Skills and Achievement in Mathematics. The study further reveals that there is no significant difference in Spatial Thinking Skills and Achievement in Mathematics among Boys and Girls. The study also reveals that there is significant difference in Spatial Thinking Skills and Achievement in Mathematics among Aided, Unaided and Government school students of standard Nine. And there is a high relationship between Spatial Thinking Skills and Achievement in Mathematics among the students of Standard Nine.

Key Words:- *Spatial Thinking Skills, Achievement in Mathematics, Secondary School Students, etc.*

Introduction

Education is a never ending process of inner growth and development. It is holistic in character; it is just like an artist who moulds the raw materials of child into a better, pure and noble person. Mathematics has certain unique features which one can hardly find in other disciplines. The importance of scholastic or academic achievement has raised important questions for educational researchers. What factors promote achievement in schools and how far do these different factors contribute towards achievement? When it comes to achievement in mathematics Education, it

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involves the interaction of three factors namely aptitude for learning, readiness for learning and opportunity for learning. Achievement in Mathematics precisely speaking implies one's knowledge, understanding and skills in the subject.

Mathematics is regarded as the mother of all sciences. If our students are to function effectively at this time of extraordinarily and accelerating global changes, they must understand Mathematics and be able to use Mathematics both in their personal and professional lives. These has never been a greater need to be mathematically literate than these days. Those who understand and proficient in Mathematics have significantly enhanced opportunities and options that open doors to productivity. Those who lack mathematical competence will find such doors and options closed. The study of mathematics provides sufficient mathematical skills to meet the demands of daily life. It provides a framework for solving problems. Therefore, mathematics is a powerful tool for the learner.

An achievement is something which someone has successes in doing, especially after a lot of effort. It was a great achievement to reach this agreement quickly. Academic achievement is the knowledge obtained or skill acquired in the school subjects. According to Downie, "Any test that measures the attainments or accomplishment of an individual after a period of training or learning is called achievement test". "Achievement is the knowledge attained or skills developed in academic subjects usually designed by test scores or by marks assigned by the teachers or both" (Good, 1945).

Spatial thinking skills in Mathematics

Thinking is one of the important aspects of teaching and learning. Teaching children to become effective thinkers is increasingly recognized as an immediate goal of education. A child's ability to learn and solve the problems depends upon his ability to think correctly. It helps him in adjustment and is necessary for successful living. A man who can think distinctly, consecutively and carefully can only contribute something worthwhile to the society. But one is not a born thinker. One has to learn to think just as one has learnt to perceive. The child has to be trained in keeping himself away from the incorrect and useless thinking besides having knowledge and practice of the methods of adequate thinking. Thinking is the highest mental activity present in a man. All human achievement and progress is simply the product of thought.

Mathematical thinking is the mental activity involved in the abstraction and generalization of mathematical ideas. There are different types of thinking strategies needed for learning mathematics. Lateral thinking skills, convergent thinking skills, abstract thinking skills, spatial thinking skills and so on. Among these, developing Spatial Thinking Skill is very much important because of the advancement in science and Technology in this modern era. Spatial Thinking is powerful. It solves problems by managing, transforming and analyzing data sets and by communicating the results of those processes to one's self and to others. Spatial Thinking has been receiving increased attention in the past several years. It has a large number of applications in our day-to-

day life. According to National Research Council Committee of USA (2006) "Spatial Thinking is a constructive amalgam of three mutually reinforcing components: the concept of space, tools of representation, and processes of reasoning".

Spatial ability, often referred to as thinking pictures, is important for generating and conceptualizing solutions to multi-step problems that arise in area such as architecture, engineering, science, mathematics, art, games and everyday life. Spatial functioning is a mental process, which is associated with the brain's attempts to interpret certain types of incoming information. This information is basically anything visual-pictures, maps, plans etc. while other types of intelligence (such as mathematical ability) are historically esteemed by society, spatial ability is probably and silently the most vital aspect of the human's mental capabilities.

Spatial Thinking is the capacity to perceive the visual world accurately, to perform transformations and modifications upon one's initial perceptions, and to be able to re-create aspects of one's visual experience, even in the absence of relevant physical stimuli (Gardner, 1987). The operational definition of Spatial Thinking denotes the ability to judge the relations of objects in space, to manipulate them mentally, to visualize the effect of putting them together or of turning them over or around.

Need for the study of Spatial thinking skills in Mathematics

Mathematics has not only been useful in its own right but it has also enriched the world by helping to develop other fields of helping to develop other fields of knowledge. It helps in our quest for knowledge, truth and beauty, desire to interpret and control our environment. Our culture is on the move through Mathematics. Mathematical foundation skills are crucial for success in today's high performance work place.

Nearly a century of research confirms the close connection between Spatial Thinking and mathematics performance. In general, people with strong Spatial Skills also tend to perform well in mathematics. Moreover the strength of this connection does not appear to be limited to any one strand of mathematics. Researchers have found evidence to suggest that Spatial Thinking plays an important role in arithmetic, word problems, measurement geometry, algebra and calculus. Spatial thinking was a better predictor of mathematic as success than either verbal or mathematical skills. Mathematics learning disability related to spatial cognition is called *spatial acalculia*, which is characterized by difficulties aligning numerals and reading operational signs.

Spatial Thinking Skills help in developing a positive attitude and in making connections between Mathematics and everyday thinking. The development of Spatial Thinking Skills in Mathematics has been a primary problem for the researchers, educators and teachers for many years. So children should develop Spatial Thinking Skills especially in terms of learning of Mathematics. Spatial Mathematical Thinking will help an individual to be strong in everyday mathematical problem solving skill. Spatial visualization, reasoning and representation can help to develop the Mathematical skill.

This study will be conduct to students of Standard   Nine because students in this age begin to perceive the structure of Mathematics as a discipline. At this stage, students integrate the many concepts and skills that may lead into a problem solving ability. Mathematical modeling, spatial visualization, spatial reasoning, data analysis and interpretation taught at this stage can consolidate a high level of mathematical literacy. . A majority of children have a sense of fear and failure regarding Mathematics. Hence, they give up early on, and drop out of serious mathematical learning. The curriculum is disappointing not only to this non-participating majority, but also to the talented minority by offering them no challenges. Problems, exercises and methods of evaluation are mechanical and repetitive, with too much emphasis on computation. Areas of Mathematics such as Spatial Thinking are not developed enough in the curriculum. (National Curriculum Framework, 2005)

Spatial Thinking is malleable and can be improved through education and experience. Spatial Thinking is made up of many skills, and for this reason, it is possible to excel in certain aspects of Spatial Thinking, such as navigational skills, while demonstrating relative weaknesses in other areas, such as visualization skills. Spatial Thinking Skills can be improved through an assortment of activities and across all age groups. The teacher can suggest some techniques to improve Spatial Thinking Skills such as

- Puzzle play
- Video games (eg. Tetris)
- Block building
- Practicing spatial activities
- Art and design tasks
- In class lesson and activities designed to support and develop student's Spatial Thinking Skills.

Spatial Thinking is not a magical process or a matter of genetic endowment, but a learned mental process. For solving mathematical problems, we need the skills such as reasoning, hypothesizing, problem solving, information processing and evaluation. Each of these thought requires the application of a rational, questioning approach in order to be successful. The importance of the study of Spatial Thinking is to help one learn to think properly and focus our mind so we can come up with a solution.

Need for the Study of Achievement in Mathematics

Achievement in Mathematics is necessary for higher studies. Fundamental mathematical skills are needed as the basic survival tools for life. Appropriate experiences with Mathematics enhance the ability to be systematic and spatial problem solvers. Achievement test will increase student's confidence level.

Mathematical literacy is a necessity in today's world. Fundamental mathematical skills are needed as the basics survival tools for life. Furthermore the word is changing so rapidly, we don't know what kinds of problems that today a child will be faces tomorrow. So above all they need to be able to be systematic, logical problem solvers. Appropriate experiences with Mathematics enhance that ability.

The importance of scholastic or Academic Achievement has raised important questions for educational researchers that, factors promote Achievement in schools and how far do the different factors contribute towards Achievement in Mathematics education, Spatial Thinking Skills have a considerable influence on how a child performs in mathematical accomplishment.

Significance of the Study of Spatial Thinking Skills

There is a connection between Spatial Thinking Skill and Mathematics performance. Students with strong Spatial Skill also tend to perform well in Mathematics. Geddes (1993) claimed that studying geometry will develop spatial sense and provide opportunities for developing divergent thinking and creative problem solving as well as logical thinking abilities of students. Burns expressed that, appropriate geometry experiences were useful for developing reasoning processes which in turn support problem solving skills in children.

Mathematics is exact and true. So it always demands originality for its learning. There for the aim of the teacher is to develop child's resources to think and reason mathematically, to pursue assumptions to spatial conclusions and to handle abstractions. Visual spatial skills are of great importance for success in solving many tasks in everyday life. Having children develop a positive attitude towards, and a liking for, Mathematics at the primary stage is as important, if not more as the cognitive skills and concepts that they acquire. Mathematical games, puzzles and stories help in developing a positive attitude and in

making connections between mathematics and everyday thinking   (NCF, 2005). Spatial thinking skills help the students to develop the ability to think. Besides numbers and number operations, due importance must be given to shapes, spatial understanding, patterns, measurement and data handling. The curriculum must explicitly incorporate the progression that learners make from the concrete to the abstract while acquiring concepts (NCF, 2005).

All these studies highlight the importance of Spatial Thinking Skills in Mathematics. Also Spatial Thinking is recognized as a fundamental part of school curriculum due to its importance as a problem solving tool in many different disciplines especially in Mathematics. Therefore, the development of Spatial Thinking Skills in Mathematics has been a primary problem for the researchers, educators and teachers for many years. So children should develop Spatial Thinking Skills especially in terms of Mathematics. Before that one has to know the extent of Spatial Thinking Skills in Mathematics among children to provide proper help to develop this skill and to nurture it.

Individuals with Spatial mathematical thinking will fall into one or perhaps all of the following sectors

- Educational Mathematical Achievement
- Studied Mathematics at school / college and achieved good grades
- Strong everyday Mathematical skills
- Enjoys utilizing ones Mathematical skills in everyday life
- Everyday problem solving skills naturally inquisitive, curios and investigative

- Ability to apply spatial reasoning skills to solve everyday problems

So Spatial Thinking has an important role in Mathematics education.

Significance of the Study of Achievement in Mathematics

Mathematical performance of the students can be improved by training them on spatial tasks, several studies have shown that Spatial Thinking Skills are positively related to Achievement in Mathematics. Spatial Thinking Skills help the students like reasoning, orientation, representation, and visualization. This helps them into a highest achievement.

Educators believe that awareness of the Spatial Thinking Skill of their students will lead to effective teaching and active learning. They insisted that curriculum content and activities should match the student's reasoning abilities. With the proper learning experience instruction can develop the higher order thinking skills of students and help to lift the intellectual development and academic achievement of students to higher levels.

Statement of the problem

Investigator states the research problem of the study as "A study on Spatial Thinking Skills and Achievement in Mathematics among the Students of Standard Nine of Kottayam District".

Operational Definitions of the key Terms

- ***Spatial Thinking Skills***

"Spatial Thinking Skills are considered to those mental skills concerned with understanding, manipulating, reorganizing or interpreting relationship visually" (Mc Gee, 1979).

- ***Achievement in Mathematics***

"Achievement in Mathematics refers to the knowledge attained or skills developed in the subject of mathematics, usually designed by the test scores or marks assigned by the teachers" (Good, 1945).

- ***Students of Standard Nine***

Students of Standard Nine are defined as the students who are in the age of 14-15 years both boys and girls belonging to Government, Aided and Unaided schools of Kottayam district.

- ***Kottayam District***

The investigator defines Kottayam District as one of the fourteen Revenue Districts in the state of Kerala.

Objectives of the Study

The investigator formulated the objectives for the present study as follows,

- To study the distribution of scores on Spatial Thinking Skills among the Students of Standard Nine.
- To study the distribution of the scores on Achievement in Mathematics among the Students of Standard Nine.
- To study the significant difference if any in the Means of scores on Spatial Thinking Skills among the Students of Standard Nine with regard to

  a) Gender

  b) Locale and

  c) Type of Management

- To study the significant difference if any in the Means of scores on Achievement in Mathematics among the Students of Standard Nine with regard to

  a) Gender

  b) Locale and

  c) Type of Management

- To study the relationship between Spatial Thinking Skills and Achievement in Mathematics among the Students of Standard Nine.

Hypotheses of the Study

The investigator formulated the following Research Hypotheses for the study.

1. There exists a significant difference in the Means of scores on Spatial Thinking Skills among the Boys and Girls of Standard Nine.

2. There exists a significant difference in the Means of scores on Spatial Thinking Skills among the Students of Standard Nine of Urban and Rural area schools.

3. There exists a significant difference in the Means of scores on Spatial Thinking Skills among the Students of Standard Nine of Aided, Government and Unaided schools.

4. There exists a significant difference in the Means of scores on Achievement in Mathematics among the Boys and Girls of Standard Nine.

5. There exists a significant difference in the Means of scores on Achievement in Mathematics among the Students of Standard Nine of Urban and Rural area schools.

6. There exists a significant difference in the Means of scores on Achievement in Mathematics among the Students of Standard Nine of Aided, Government

and Unaided schools.

7. There exists a significant relationship between Spatial Thinking Skills and Achievement in Mathematics among the Students of Standard Nine.

Methodology of the Study

The present study used the Descriptive Survey method for the collection of data on Spatial Thinking Skills in Mathematics among the Students of Standard Nine.

Population of the Study

The population of the present study consists of all the Government, Aided and Unaided school students of Standard Nine of Urban and Rural schools of Kottayam District.

Sample of the Study

Stratified Random Sampling technique used by the investigator to select the sample. The present study conduct on a representative sample of 402 Students of Standard Nine of Kottayam District.

Tools used for the Study

- A test on Spatial Thinking Skills: -
- Achievement test scores in Mathematics of terminal examination

Statistical Techniques used for the Study

Descriptive Statistics:-

- Arithmetic Mean

- Standard Deviation

- Graphical Representation

- Karl Pearson's Product Moment Correlation

Inferential Statistics

- Two-tailed test (t-test)

- One way ANOVA

Table 1
Distribution of the scores of Spatial Thinking Skills

Class Interval	Frequency	% of Frequency
10-20	4	.99
20-30	22	5.47
30-40	36	8.96
40-50	50	12.44
50-60	57	14.18
60-70	62	15.42
70-80	69	17.16
80-90	79	19.65
90-100	23	5.47
Total	402	100

The first objective was to study the Spatial Thinking Skills among the Students of Standard Nine. From the table, it is interpreted that highest number of students ie, 79 students fall in the class interval of 80-90. Ie, 19.65% of the students fall in this score. .99% belongs to the class interval 10-20. Only 5.47% got scores in the class interval 20-30. This shows that the scores are not normally distributed around the central score.

Table 2
Classification of total sample of students based on their scores on Spatial Thinking Skills

Level of Spatial Thinking Skills	Range	Number of students	Percentage
High Spacial Thinking Skills	Above 81.83	87	21.64
Average Spatial Thinking Skills	Between 81.83 and 42.29	237	58.96
Low Spatial Thinking Skills	Below 42.29	78	19.40
Total		402	100

We have to find out the level of Spatial Thinking Skills. The investigator classified the whole sample based on the scores obtained in the tool titled Test on Spatial Thinking Skills. The classification is as follows. By using the Mean and Standard deviation of the scores it is easy to classify the students according to their Spatial Thinking Skills. Majority of students have Average Spatial Thinking Skills. Only 21.64% of students have high Spatial Thinking Skills. About 19.40% of students have low Spatial Thinking Skills.

Table 3
Distribution of the scores of Achievement in Mathematics

Class Interval	Frequency	% of Frequency
0-10	3	.75
10-20	21	5.22
20-30	30	7.46
30-40	36	8.96
40-50	44	10.95
50-60	50	12.44
60-70	54	13.43
70-80	58	14.43
80-90	72	17.91
90-100	34	8.46
Total	402	100

The second objective was to study the Academic Achievement among the Students of Standard Nine. From the table, it is interpreted that highest number of students ie, 58 students fall in the class interval of 70-80. Ie, 14.43% of the students fall in this score. 75% belongs to the class interval 0-10. Only 5.22% got scores in the class interval 10- 20. This shows that the scores are not normally distributed around the central score.

Table 4

Classification of total sample of students based on their scores Achievement in Mathematics

Level of Achievement in Mathematics	Range	No. of students	Percentage
High Achievement in Mathematics	Above 83.22	82	20.39
Average Achievement in Mathematics	Between 83.22 & 33.82	226	56.23
Low Achievement in Mathematics	Below 33.82	94	23.88
Total		402	100

We have to find out the level of Achievement in Mathematics. The investigator classified the whole sample based on the scores obtained in the scores of Achievement test in Mathematics. The classification is as follows. By using the Mean and standard deviation of the scores it is easy to classify the students according to their Achievement in Mathematics. Majority of students have Average Achievement in Mathematics. Only 20.39% of students have high Achievement in Mathematics. About 23.88% of students have low Achievement in Mathematics.

Table 5

Significance of the difference between the means of scores of Spatial Thinking Skills among the Students of Standard Nine with regard to Gender and Locale

Variable	Category	N	Mean	S.D	Df	t value	p value	Remark
Male	201	61.68	19.97	400	.388	.699		Not Significant
Female	201	62.44	19.60					at .05 level
Urban	200	60.06	20.05	400	2.027	.043		Significant
Rural	202	64.04	19.33					at .05 level

The third objective was to find out the significance difference if any among the students of standard nine based on Gender and Locale. The investigator used inferential statistics to find out the significant difference between the mean scores of the variables. The above table reveals that the t values indicating the differences in the means of scores of Spatial Thinking Skills among the Students of Standard Nine grouped in terms of Gender are less than the table value 1.96 and the obtained p value is not less than .05 at .05 level of significance with degrees of freedom 400. And t values indicating the differences in the means of scores of Spatial Thinking Skills among the Students of Standard Nine grouped in terms of Locale are greater than the table value 1.96 and the obtained p value is less than .05 at .05 level of significance with degrees of freedom 400.

It shows that the male and female, students of standard Nine do not differ significantly in their Spatial Thinking Skills and Means of the scores on Spatial Thinking Skills among the Students of Standard Nine with regard to Locale differ significantly.

Table 6

Comparison of the Means of the Scores on Spatial Thinking Skills with regard to Type of Management

Variable	Category	Sum of Square	df	Mean Square	F- value	Remarks
Spatial Thinking Skills	Between Groups	14877.02	2	7438.51		Significant at .05 level
	Within Groups	141784.83	399	355.35	20.933	
	Total	156661.85				

The third objective was to find out the significance difference if any among the students of standard nine based on Type of management. The investigator used inferential statistics to find out the significant difference between the mean scores of the variables. From the table the investigator interprets that the obtained F- value 20.933 is greater than the table value 3.02 at .05 level of significance with degrees of freedom 3/399. It shows that Means of Scores on Spatial Thinking Skills with regard to Type of Management differ significantly.

Table 7

Multiple Comparison of different pairs of Spatial Thinking Skills

Type of Management (I)	Type of Management (J)	Mean Difference	Std. Error	p- value
Aided	Government	9.25926*	2.29444	.000
	Unaided	14.75535*	2.30744	.000
Government	Aided	9.25926*	2.29444	.000
	Unaided	5.49609*	2.30744	.000
Unaided	Aided	14.75535*	2.30744	.000
	Government	5.49609*	2.30744	.000

* The Mean Difference is significant at the .05 level

The investigator presents pairwise comparison of Spatial Thinking Skills among the Students of Standard Nine with regard to Type of Management in the Table 5

From the Table 5 the investigator interprets that

• There is significant difference between the Means of scores on Spatial Thinking Skills of Students of Standard Nine of Government and Unaided schools.

• There is significant difference between the Means of scores on Spatial Thinking Skills of Students of Standard Nine of Aided and Government schools.

• There is significant difference between the Means of scores on Spatial Thinking Skills of Students of Standard Nine of Aided and Unaided schools.

Table 8

Significance of the difference between the means of scores of Achievement in Mathematics among the Students of Standard Nine with regard to Gender and Locale

Variable	Category	N	Mean	SD	df	t- value	p- value	Remarks
Achievement in	Male	201	58.89	25.14	400	.298	.766	Not significant
Mathematics	Female	201	59.15	24.32	400			at .05 level
	Urban	200	53.71	26.82	400	3.950	.000	
	Rural	202	63.28	21.44	400			significant at .05 level

From the above table the investigator interprets that the obtained   t- value with regard to Gender is .298, less than the table value 1.96 at .05 level of significance and p- value is .766 which is greater than .05 with degrees of freedom 400. It shows that Means of the Scores on Achievement in Mathematics among the Students of Standard Nine with regard to Gender do not differ significantly. And the obtained t- value with regard to Locale is 3.950, greater than the table value 1.96 at .05 level of significance and p- value is .000 which is less than .05 with degrees of freedom 400. It shows that Means of the Scores on Achievement in Mathematics among the Students of Standard Nine with regard to Locale differ significantly.

Table 9

Comparison of the Means of the Scores on Achievement in Mathematics with regard to Type of Management

Variable	Category	Sum of Square	df	Mean Square	F- value	Remarks
Achieve- ment in	Between groups	34752.29	2	17376.15		Significant at
Mathematics	Within groups	209975.47	399	526.25	33.019	.05 level
	Total	244727.76				

From the table the investigator interprets that the obtained F- value 33.019 is greater than the table value 3.02 at .05 level of significance with degrees of freedom 2/399. It shows that Means of scores on Achievement in Mathematics with regard to Type of Management differ significantly.

Table 10

Multiple comparison of different pairs of Achievement in Mathematics

Type of Management (I)	Type of Management (J)	Mean Difference (I-J)	Std. Error	p- value
Aided	Government	20.8556*	2.79220	.000
	Unaided	18.22706*	2.80802	.000

Government	Aided	20.85556*	2.79220	.000
	Unaided	2.62849	2.80802	1.000
Unaided	Aided	18.22706*	2.80802	.000
	Government	2.62849	2.80802	1.000

*The mean difference is significant at the .05 level.

From the Table 8 the investigator interprets that

- There is no significant difference between the Means of scores on Achievement in Mathematics among the Students of Standard Nine of Government and Unaided schools.
- There is a significant difference between the Means of scores on Achievement in Mathematics among the Students of Standard Nine of Aided and Government schools.
- There is a significant difference between the Means of scores on Achievement in Mathematics among the Students of Standard Nine of Aided and Unaided schools.

Table 11

Relationship between Spatial Thinking Skills and Achievement in Mathematics

Variables	Number	Degrees of freedom	Calculated r- value	Remarks
Spatial Thinking Skills Achievements in Mathematics	402	400	.719	Significant at.05 level

From the Table the investigator interprets the calculated r-value .719 is greater than the table r- value .098 at .05 level of significance with degrees of freedom 400. Thus the investigator concludes that there is a significant positive correlation between Spatial Thinking Skills and Achievement in Mathematics among the Students of Standard Nine. This result indicates that improvement in the performance of Spatial Thinking Skills of Students there should be a corresponding increase in their Achievement in Mathematics.

Major Findings of the Study

1. The distribution of scores of Spatial Thinking Skills and Achievement in Mathematics is not normally distributed.

2. Most of the students have Average Spatial Thinking Skills and Achievement in Mathematics.

3. There is no significant difference in Spatial Thinking Skills and Achievement in Mathematics among Boys and Girls.

4. There is significant difference in Spatial Thinking Skills and Achievement in Mathematics among Aided, Unaided and Government school students of standard Nine.

5. There is a high relationship between Spatial Thinking Skills and Achievement in Mathematics among the students of Standard Nine.

Discussion of the results

The study reveals that Spatial Thinking Skills and Achievement in Mathematics among the students of standard Nine are moderate. Only 21.64% and 20.39% of the 402 students of standard Nine who formed high level of Spatial Thinking Skills and Achievement in Mathematics. Further analysis reveals that male and female students of standard Nine do not differ significantly in their Spatial Thinking Skills and Achievement in Mathematics. This indicates that Gender have no influence on their Spatial Thinking Skills and Achievement in Mathematics. The study also revealed that there is a significant difference in the Means of Scores on Spatial Thinking Skills and Achievement in Mathematics among the Students of Standard Nine with regard to Locale and Type of Management. Also there is a positive correlation between Spatial Thinking Skills and Achievement in Mathematics.

References

Francis. (2014). Multiple Intelligence and Academic Achievement of Javahar Navodaya Vidyalaya Students. Journal of the Ground Builder: an   attempt to recent quality education, 3(1), 55-58.

Malini, P. M. (2014). Gender difference in relation of Mathematical Creativity   w i t h Achievement in Mathematics. Journal of Educational Extracts, 2(2),   119-123.

Mahmood, Alam, M. (2009). A study on Academic Achievement in   Mathematics in relation to Creativity and Achievement Motivation. Edutracks, 5(2), 11-15.

Minikutty, A., & Krishnan, Sunitha. (2014). Spatial Thinking Skills in Mathematics. Journal of Educational Research and Extension, 51(2), 1-6.

Raj, Lidson, J. (2014). Spatial Ability and Mathematics Achievement of Secondary School Students of Kerala with special reference to   Gender, Locality and Type of Management. Journal of Research   and Pedagogic Interventions,   3(1), 112-118.

Rinsa, P.V., & Sumangala, V. (2012). Interaction Effect of Thinking styles and Deductive Reasoning on Problem Solving Ability in Mathematics of Secondary   School Students. Journal of Endeavours in Education, 3(1),   44-48.

EMOTIONAL INTELLIGENCE AND KNOWLEDGE MANAGEMENT OF TECHNICAL STUDENTS

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Abstract

Emotional Intelligence is defined asthe subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions. Its components involveself-awareness, self-control, motivation, empathy and social skills. Emotional intelligence has proven a better predictor of future success than traditional methods like the GPA, IQ, and standardized test scores. Hence the great interest in emotional intelligence on the part of corporations and universities. Knowledge Management (KM) efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation and the sharing of lessons learned. KM efforts overlap with organizational learning and focus on encouraging the sharing of knowledge. It is an enabler of organizational learning. Many students in the technical sector have a discomfort in the transition from school to professional course. The problems are adapting a new learning environment with often increased academic expectations, the number of back papers, career anxiety etc. Due to the lack of emotional maturity, the technical students are unable to face the career challenges. In this backdrop, the present study aims to analyze the emotional intelligence and to assess the relationship between knowledge management and emotional intelligence of technical students. Emotional intelligence was found to be positively associated with knowledge management.

Key Words: *Emotional Intelligence, Knowledge Management, Organizational Objective, Improved Performance, Competitive Advantage, Innovation, etc.*

INTRODUCTION

Emotional Intelligence (EI) is a type of non-intellective intelligence, sometimes described as "social intelligence." EI itself was first defined in the early 1990s by Salovey and Meyers as "a type of social

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intelligence that involves the ability to monitor one's own and others' emotions, to discriminate among them, and to use this information to guide one's thinking and actions." Emotional Intelligence encompasses the following five characteristics and abilities:

- Self-awareness -- knowing your emotions, recognizing feelings as they occur, and discriminating between them
- Self-Regulation--handling feelings so they're relevant to the current situation and you react appropriately
- Motivation--"gathering up" your feelings and directing yourself towards a goal, despite self-doubt, inertia, and impulsiveness
- Empathy--recognizing feelings in others and tuning into their verbal and nonverbal cues.
- Social Skills--handling interpersonal interaction, conflict resolution, and negotiations

Knowledge management (KM) is the process of capturing, developing, sharing, and effectively using organizational knowledge. It refers to a multi-disciplinary approach to achieving organizational objectives by making the best use of knowledge.

NEED FOR THE PRESENT STUDY

According to the new concept -brain-based learning-emotional health is fundamental to effective learning. The most critical element for a student's success is an understanding of how to learn and how can be applied the learned knowledge to human welfare.i.e. Knowledge Management and Emotional Intelligence. The idea of Emotional Intelligence has inspired research and

curriculum development throughout these facilities. Researchers have concluded that people who manage their own feelings well and deal effectively with others are more likely to live meaningful lives. In addition, happy people are more apt to retain information more effectively than dissatisfied people. This statement reveals the connection between Emotional Intelligence and Knowledge management.

Students are able to reach their maximum potential in cognitive and personal level provided their emotional functioning is healthy. The Present study provides academic and intellectual strength to the technical students by modifying their level of emotional intelligence. It also helps to mold the personality of students with high emotional competencies –i.e, with high emotional intelligence

Many students in the technical sector have a discomfort in the transition from school to professional course. The problems are adapting a new learning environment with often increased academic expectations, the number of back papers, career anxiety etc. Due to the lack of emotional maturity, the technical students are unable to face the carrier challenges.   In this backdrop, the present study aims to analyze the emotional intelligence and to assess the relationship between knowledge management and emotional intelligence of technical students. Emotional intelligence was found to be positively associated with knowledge management.

Considering all these elements, the investigators entitled the study and paper, "Emotional Intelligence and Knowledge

Management of Technical Students in accordance with Gender, Locality and Mode of Fee Payment".

OBJECTIVES

- To compare the level of emotional intelligence in total and in dimension wise in terms of gender, locality and mode of fee payment of technical students.
- To assess the relationship between emotional intelligence and knowledge management of technical students.

HYPOTHESES

1. There is no significant difference between the mean scores of Emotional Intelligence of technical students in total and in dimensionwisein accordance withgender.
2. There is no significant difference between the mean scores of Emotional Intelligence of technical students in total and in dimensionwisein accordance withlocality.
3. There is no significant difference between the mean scores of. Emotional Intelligence of technical students in total and in dimensionwisein accordance with mode of fee payment.
4. There is no significant relationship between the emotional intelligence and knowledge managements of technical students.

MATERIALS AND METHODS

Sample

200 engineering college students are selected for conducting the emotional intelligence test.Sample is selected from the Engineering College where the researcher is working Since the study is based on the

cognitive and affective dimensions of engineering (BTech) curriculum, a close contact and a good rapport is essential. So the sample selection is limited to a single College.

Table1

Sample Distribution

Category	Components	N
Gender	Girls	100
	Boys	100
Locality	Urban	100
	Rural	100
Fee Payment	With educational Loan	100
	Without educational Loan	100

Tools used for the study

Emotional Intelligence Test (EIT) was prepared and standardized by the researcher itself.It contains 60 questions of 5 subscales- Self awareness, self regulation,social skill, empathy and motivation and are ranked the options in a four point Scale-Very High-4, High-3,Average-2 and poor-1.By using Cronbach's alpha method, the reliability of the questionnaire is measured. (0.83). For measuring the knowledge management of technical students, a java script standardized tool is used and it is administered as an online test.

ANALYSIS AND INTERPRETATION OF THE DATA

From table 2, it is clear that there exists a significant difference between male and female with regard to self-awareness, self-regulation, motivation and empathy.From the table male student possesses better self-awareness (mean23.45, SD=5.42), self-

regulation (mean24.15, SD=3.91), Motivation (mean=24.989.SD=3.43)   Empathy (Mean=23.76,SD=4.52) And the total score of emotional Intelligence (Mean = 119.06, SD = 14.71) is high for boys as compared to female students. While considering the case of social skills, Female students possesses better social skills as compared to male students.

Table 2

Group statistics of various dimensions of emotional intelligence with gender of the students

Emotional Intelligence – Components	Gender	N	Mean	Std. Deviation
Self Awareness	Male	100	23.45	4.78925
	female	100	20.48	6.33011
Self Regulation	Male	100	24.15	3.91159
	female	100	21.97	4.94097
Motivation	Male	100	24.89	3.42568
	female	100	23.55	4.39553
Empathy	Male	100	23.76	4.51959
	female	100	22.63	4.48038
Social Skills	Male	100	22.81	4.13337
	female	100	23.47	4.40031
Emotional Intelligence Total	Male	100	119.06	14.70918
	female	100	112.1	17.88657

From table 3, it is clear that there exist a significant difference between urban and rural students with regard to self-awareness (Urban, Mean=21.55,SD=6.41 & Rural, Mean=22.38, SD=5.09) and social skills (Urban,Mean=22.96,SD=4.33 & Rural Mean=23.32,SD=4.22).

Table 3

Group statistics of various dimensions of emotional intelligence with locality of the students

Emotional Intelligence – Components	Locality	N	Mean	Std. Deviation
Self Awareness	Urban	100	21.5500	6.41239
	Rural	100	22.3800	5.09858
Self Regulation	Urban	100	23.0300	4.83768
	Rural	100	23.0900	4.32539
Motivation	Urban	100	24.1500	4.18843

	Rural	100	24.2900	3.79605
Empathy	Urban	100	23.3500	4.75113
	Rural	100	23.0400	4.30391
Social Skills	Urban	100	22.9600	4.33431
	Rural	100	23.3200	4.22087
Emotional Intelligence	Urban	100	115.0400	17.92967
Total	Rural	100	116.1200	15.44968

While considering the self-regulation, motivation and empathy, there is no significant difference between the mean scores of urban and rural students. Rural students possess a little hike (Mean=116.12,SD=15.44) in the total emotional intelligence score when compared to urban students (Mean=115.04,SD=17.92).

From table 4, it is clear that there a significant difference between the mean scores of Emotional Intelligence of technical students in total and in dimension wise in accordance with mode of feepayment. Table3 depicts that students with educational loan possess better self-awareness (mean=22.24,SD=5.25),self-regulation (mean=23.19,SD=4.04), Motivation (mean = 24.54, SD=3.53), Empathy (Mean=23.72, SD=4.36) and the total score of emotional Intelligence (Mean=117.96,SD=13.69) as compared to students without educational loan.

Table 4

Group statistics of various dimensions of emotional intelligence with the mode of fee payment

Emotional Intelligence	Fee Payment	N	Mean	Std. Deviation
Self Awareness	With educational loan	100	22.2400	5.25149
	Without educational loan	100	21.6900	6.30327
Self Regulation	With educational loan	100	23.1900	4.04693
	Without educational loan	100	22.9300	5.06973
Motivation	With educational loan	100	24.5400	3.53173
	Without educational loan	100	23.9000	4.39122
Empathy	With educational loan	100	23.7200	4.36950
	Without educational loan	100	22.6700	4.63638
Social Skills	With educational loan	100	24.2700	3.72774
	Without educational loan	100	22.0100	4.49353
Emotional Intelligence	With educational loan	100	117.9600	13.69208
Total	Without educational loan	100	113.2000	19.02205

Table 5
Descriptive Statistics of Variables

	Mean	Std. Deviation	N
Total EI	229.17	13.1520	200
KM	47.962	4.46136	200

Table 6
Correlations among Variables

		Total EI	KM
Pearson Correlation	Total EI	1.000	.166
	KM	.166	1.000
Sig. (1-tailed)	Total EI	.	.018
	KM	.018	.
N	Total EI	200	200
	KM	200	200

Table 7
ANOVA (Total Emotional Intelligence and Knowledge Management)

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	447.302	1	447.302	1.608	.206
	Residual	55067.418	199	278.118		
	Total	55514.720	200			

a Predictors: (Constant), KM

b Dependent Variable: Total EI

In order to assess the relationship between emotional intelligence and knowledge management a simple linear regression, is performed. Descriptive statistics and correlations are displayed in Table (5) and Table (6) respectively. From the Table (7), for two tailed significance 0.05(sig >0.05), Significance value (.206) is greater than 0.05. Hence null hypothesis is not accepted. The results show that there is a significant difference between the total emotional intelligence scores and knowledge management among technical students

CONCLUSION

Emotional intelligence of technical students with five subcomponents are analyzed in accordance with gender, locality and mode of fee payment.From table2, there is a significant difference between male and female students with regard to self-awareness, self-regulation, motivation and empathy.And the total score of emotional Intelligence is high for male as compared to female students. Rural students possess high emotional intelligence as a total and in dimension wise as compared to urban students. Students with educational loan possess high emotional intelligence in total and in dimension wise than those without educational loans.ANOVA score depicts that there is a significant relation between emotional intelligence and knowledge management among technical students.

REFERENCES

AbiSamra, N. (2000), The Relationship between Emotional Intelligence and Academic Achievement in Eleventh Graders, Research in Education, FED, pp 620-661.

Goleman, D. (2003) Apples and Applesauce, Issues and Recent Developments in Emotional Intelligence, 1(3), pp 425-448

Jaeger (2003), A conceptual framework for emotional intelligence in education: Factors affecting student achievement, (Vol. XIV, No. 2, pp 41-44), Unpublished doctoral dissertation, Texas A&M University-Kingsville.

Lam (2001). Emotional intelligence: Emotional intelligence: The role of transformative learning in academic excellence. (Vol. XIII, No. 2, pp. 7-10), TEXAS STUDY of Secondary Education.

Parker. J. D. A., Creque. Snr. R. E., Barnhart. D. L., Harris. J. I., Majeski. S. A., Wood. L. M., et al., (2004), Academic Achievement in high School: Does Emotional Intelligence Matter?, Personality and Individual Differences, 37(7), pp 1321- 1330 Personality, 9, 195-211.

Petrides. K. V., Frederickson and Furnham. A, and. (2005), On the dimensional structure of emotional intelligence, Personality and Individual Differences, 42, pp 313-320.

Salovey, P. & Mayer, J .D. (1990).Emotional Intelligence, imagination, cognition, and personality, Baywood Publishing Co., pp 185-211.

Six Seconds, Emotional Intelligence Network, http://www.6seconds.org/2013/04/24/fog-how-to-use-emotio nal-intelligence-free-poster/.

Zee, K., Thijs, M. and Schakel, L. (2002), The relationship of emotional intelligence with academic intelligence and the Big Five. Eur. J. Pers., 16: 103–125.

ART AND SCIENCE OF REVIEW OF LITERATURE

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Abstract

Review of literature is an integral part of any research. The most common contexts in which review of literature is demanded are - - (1) A course assignment, (2) A short review for a research article, (3) A review for research proposal, (4) A stand alone review article and (5) A chapter-length review for thesis/dissertation. A critical analysis of the existing research provides researchers an opportunity to minimize errors and think about practical difficulties of data collection and analysis. This leads to strengthening of the scientific approach of eliminating possible short-comings in research. The review of literature involves two processes - - (1) Selection of the literature and (2) Scrutinizing the studies with respect to five dimensions - - Accuracy, Authority, Objectivity, Currency and Coverage. Moreover, there are seven important steps in the task of review of literature such as - - (1) How to search for studies? (2) How to select studies? (3) How to analyze studies? (4) Which scheme is appropriate for analysis? (5) How to compose/organize review of literature? (6) Scheme of presentation of review and (7) Conclusion. A review of the literature with proper identification, selection and evaluation will be the beacon light for the researcher as well as for those who read the review.

Introduction

Review of literature is an integral part of any research. Every research can be considered as a link in the evolution of knowledge. Evolution of knowledge encompasses the accepted knowledge and proceeds through the evolving knowledge. What is known in the discipline needs to be gauged before undertaking any research. The review of literature is a survey of the most relevant and significant academic research on a particular topic in order to reflect the current state of knowledge in the field. However, the scope and purpose of review of literature vary with the context. The most common contexts in which review of literature is demanded are - - (1) A course assignment, (2) A short review for a research article, (3) A review for research proposal, (4) A stand alone review article and (5) A chapter-length review for thesis/ dissertation.

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Review of literature is an important exercise in the process of identifying and formulating a research problem. Selecting a topic and carrying out research is a subjective enterprise, nevertheless it is a systematic process of enquiry. A critical analysis of the existing research provides researchers an opportunity to minimize errors and think about practical difficulties of data collection and analysis. This leads to strengthening of the scientific approach of eliminating possible short comings in research.

The purpose of review of literature is to convey your reader what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are. As a piece of writing, the literature review must be defined by a guiding concept such as the research objective. It is not just a descriptive list of the material available, or a set of summaries. The researcher is not trying to list all the material published, but to synthesize and evaluate it according to the guiding concept of the thesis or research question. The review of literature involves two processes - - (1) Selection of the literature and (2) Scrutinizing the studies with respect to five dimensions. The five dimensions are - - Accuracy, Authority, Objectivity, Currency and Coverage. Accuracy refers to the reliability of information available. Authority entails academic credential of the author and the institution to which s/he is affiliated. Objectivity implies the unbiased nature of the information. Currency deals with the time frame of the information made available. Coverage delineates the breadth and depth of the information as will be required in the context.

The above processes will help synthesize results into a summary of what is known and what is not known. Also, the exercise will help identify areas of controversy in the literature. At this point it will be appropriate to focus on the purpose of the literature review detailed above. The length of the review or adequacy of the review of literature will be judged based on the purpose for which the review of literature is done. It is likely that there may be contradicting literature on a particular topic/area. The researcher will have to deal this carefully to alert the reader that such instances are also found in the literature. Often such contradictions result from authors orientation or the theoretical framework relied on. Researcher will have to include and deal with literature with which s/he may not agree with.

There are seven important steps in the task of review of literature. They are - - (1) How to search for studies? (2) How to select studies? (3) How to analyze studies? (4) Which scheme is appropriate for analysis? (5) How to compose/organize review of literature? (6) Scheme of presentation of review and (7) Conclusion. Each of these steps is detailed below.

(1) How to search for literature?

The first phase of review of literature is to identify and effectively locate needed literature. To enable this researcher must develop skills in digging information. Resources are available as hard copies and in digital format. Some of the resources are available in both soft and hard copy format. These documents include - - Standard Books, Academic Journals, Encyclopedia, Survey of Research, Dissertations Abstract

International (DAI), Educational Resources Index Catalogue (ERIC), Thesis/Dissertation, Proceedings of conferences/seminars, Reports of Governments, Reports of NGOs, News Letters, etc.

Digital resources are many and billions of textual documents are indexed by each agency. The outcome of website search depends on the search Engine used in tapping the information. Some of the popular search engines are - - Clusty.com, Ask.com, Altavista.com, Google.com, Askusnow.com, Meebo.com, AllTheWeb.com, Inktomi.com, Teoma.com, etc. These search engines will fetch different sets of information.

There are different websites to search for the relevant literature such as www.Cambride.com/asia/collections archive.org; inflibnet; doaj.org ; Scopus; Pro-Quest (OAJ); British Library – archive.org/web.web.php; Jstor; Ebsco; Sage.pub; Journals.cambridge.com; Wiley Online Library; IOSR (International Organization of Scientific Research) - JHSS (Journal of Humanities and Social Sciences), Delnet, educational research complete (erc), PsycINFO, EconLit, ERIC (Educational Resources Information Center), FRANCIS, Teacher Reference Center, Web of Science, Assia, EMBASE, Cochraine data bases, Sinahl, Psychological Abstracts, DAI (Dissertation Abstracts International), etc. However, peer-reviewed journals should be preferred as they will carry original research studies which are known as primary sources. Although the review contains mostly original research studies, other resources such as books and encyclopedia are also helpful in locating original research or in providing background information on the topic.

In any search for literature, it is desirable to use multiple search engines as well as multiple databases. The reason is that the search engines and databases often provide different set of articles/information. During your search for literature, especially when searching for articles in databases, researchers rely very much on keyword searching. To conduct a keyword search, researchers need to formulate a search statement. Then, identify the keywords or the main concepts of the research topic. Think of similar terms (synonyms) or phrases that might also be used to describe these concepts, to ensure that you do not miss out any relevant information. You can use a thesaurus to help find synonyms. For example, you can first arrange the main concepts in columns. Then under each column write down similar terms or phrases that may also be used to represent that concept. Subsequently, you can combine your search terms in a way that a database can understand. To do this, you need to use the words such as AND, OR, NOT, etc (Boolean operators).

In the process of searching literature using multiple search engines and databases, it is highly desirable to keep a record of what you have done to perform the search, such as the search engines/databases you have used, the keywords you have combined and searched, and the search results retrieved using various search statements. From what you have done, you will then know what you should do next. At times certain websites (as a trial period) permit you to download articles free of cost which may be for a month or so. Therefore, keeping track of what you have done is very important for an effective review of literature.

Periodicals are another type of resources which include Trade magazines such as Oil and Gas Investor, Popular magazine such as Newsweek and Newspapers such as the Wall Street Journal. These are of immense value to locate the date of an event which happened in the near past. When you use resources in your literature review, whether the resources are books, journal articles, theses or websites, it is important that you always cite the resources that you use. By citing sources properly, you give credit to those who created the original information resources. By citing the sources and creating proper references you are maintaining academic integrity and academic honesty. Also you allow readers to consult the original resources and prevent plagiarism. Moreover, the work in the field by one researcher is connected with the wrok of others in the discipline. Now, it is customary that researchers write out names of the databases that they have searched and the period for which the search was conducted. This will help the researcher to defend the outcome of the review of literature.

(2)   How to select studies?

The next phase of review of literature is to evaluate each study with a focus on the research topic/area/variable(s). This will require multi-level scanning with respect to the nature of the journal in which it was published (e.g., Impact Factor), the date of publication, the author of the article, the comprehensiveness of the references given, etc. This evaluation may bring surprises such as conflicting evidences especially in social sciences. The reason may be - - missing or over represented sample, the period for which the literature is reviewed, the different

techniques used to locate studies, etc. Therefore, all resources should be explored and as a general convention the review should be conducted for a period of past twenty years.

It is important that the review should not rely too heavily on secondary sources. The review should present materials that are pertinent to the area of research. The literature reviewed should be long enough to demonstrate to the reader that the researcher has a sound understanding of the relationship between what has been done and what will be done.

The problem of selecting studies for review is far more important than collecting studies in a particular area of interest. First of all, details of the source of the article/ material are to be documented comprehensively. All elements necessary to provide reference as per the APA Manual will have to be collected before including the study for review. Studies included in reputed journals should be given preference in reviewing the literature. If theoretical framework is an important aspect of the review, then standard books of reputed authors must be consulted.

Information overflow is the problem of these decades and articles of dubious quality must be eliminated. Some of the open domain sites allow anybody to edit/add to the information which will result in poor quality of material. After reading ten to fifteen articles in the topic of interest, researcher will be able to gauge two important things - - (1) which are the journals in which most of the studies in the area of interest are reported and (2) who are the giants of reputation in the field of interest. Since most of the

journals provide e-mail address of authors, it is quite easy to contact these persons. There is no short cut to this exercise of reading and getting acquainted with persons and their work whereby the current status of research can be assessed.

(3)   How to analyze studies?

A general approach (Jackson, 1980) to analysis has four dimensions - - (a) What is known? (b) How well is it known? (c) How little is known? And (d) What is not known? Indiscriminate acceptance and use of any other research is undesirable. The purpose of analysis of studies is to infer generalization about an issue from a set of studies. Further, it is important to identify what earlier research has left unattended/unresolved (Cooper, 1982; 1989). Moreover, analysis of studies helps interpret other studies and appraise new methodological developments in the area of interest.

(4)   Which scheme is appropriate for analysis?

Jackson (1980) has referred to four categories of review. They are - - listing, excluding, averaging and vote taking. In listing, researcher simply goes on listing the studies which is a simple count or narration of studies. This is done either chronologically or as studies conducted in India and studies conducted abroad. This listing or narration is a futile exercise for it will not generate a better understanding of the field in which the study can be situated. Moreover, this will not require the ingenuity of a researcher.

Researchers often exclude certain studies from their review for unknown reason. There can be several issues in review of literature such as different names of the same construct are used (e.g., Science Achievement), different constructs are sometimes studied under a single name (e.g., Intelligence), any given construct can have different measures and measures have not been validated (Glass, 1977). However, a sound analysis of literature must provide reasons for exclusion.

Researchers often take average of the significant and non-significant studies to infer the trend in the existing literature. Congruence of findings does not assure their validity, and the lack of congruence is not a proof of invalidity. Therefore, congruence should be considered as suggestive and not conclusive. To get a trend from the literature, it is not desirable to count the number of studies in favor or against by vote taking, for the studies do differ in many dimensions.

(5)   How to compose/organize review of literature?

There are healthy practices with respect to organizing the review of literature (e.g., Light & Pillemer, 1984). The review of literature should be organized around the question of research. The variables of interest should guide the organization of review. Questions such as to which population can the main findings be generalized? How different are the samples? How different are the methods? How long was the treatment? (if the study is experimental in nature). Answers to these questions will require the skill of interpretation (hermeneutics) on the part of the researcher. A review of literature without any structure to organization will be only a recounting of studies.

On certain occasions, review of literature will generate conflicting evidence. The reason can be attributed to different techniques to locate studies, population of the study not accounted, missing and over represented samples, period for which the literature is reviewed and so on. However, conflicting findings should never be ignored. Researcher will have to examine variations for insight (Light & Pillemer, 1984). It is important to ascertain where and with whom particular findings are likely to hold good?

(6)   Scheme of presentation of review

Scheme of presentation of review of literature is important because the acquaintance of researcher with the field of investigation is summarized in the review. Depending on the nature of the study, the construct studied may have to be clarified in a tabular format. Some studies will require effect size calculations, if sample size is a matter of concern in summarizing the study. If the problem suggests a review with respect to variables and their relationships, then the scheme can be in the context of the variables involved in the study.

(7)   Conclusion

Any review literature must conclude with a summary of the current understanding as evidenced from the literature.

Significance of the research question must be substantiated by the exercise of review of literature. Important aspects of the question under research will have to be put in perspective in the background of the available literature. A review of the literature with proper identification, selection and evaluation will be the beacon light for the researcher as well as for those who read the review.

References

American Psychological Association (2009). Publication manual of the American Psychological Association (6th ed.). American Psychological Association.

Cooper, H. M. (1982). Scientific guidelines for conducting integrative research reviews. Review of Educational Research, 52, 291-302.

Cooper, H. M. (1989). The integrative research review: A Systematic approach (2nd ed.). California: Sage.

Glass, G. V. (1977). Integrating findings: The meta-analysis of research. Review of Research in Education, 5, 351-379.

Jackson, G. B. (1980). Methods of integrative reviews. Review Educational Research, 50, 438-460.

Light, R. J., & Pillemer, D. B. (1984). Summing up: The science of reviewing research. Cambridge, MA: Harvard University Press.

EFFECT OF ATTITUDE VARIABLES ON MATHEMATICAL CREATIVITY OF SECONDARY STUDENTS IN KERALA

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Abstract

Mathematically creative children should be encouraged and motivated properly. If given a chance they will do something extraordinary and remarkable. We must try to develop mathematical creativity in all children so that they may excel in their fields of interest and can lead the nations in progress. Mathematics educators hold the view that mathematical creativity is something that all students can develop if stimulated and assisted in the right kinds of learning environments. Attitude towards mathematics is another factor which influences learning. This study dealt with secondary school students of Kerala. Two districts namely Kannur and Thrissur were selected for the study. The study revealed significant differences in attitude towards mathematics in the fluency, flexibility and originality scores of mathematical creativity. This contributed to wide differences in mathematical creativity among the secondary students in Kerala.

Key-words: *mathematical creativity, fluency, flexibility and originality, attitude towards mathematics, etc.*

Introduction

Mathematics is a very useful subject for most vocations and higher specialized courses of learning. In this fast advancing technological and computerized world, ignorance of mathematics will be a great handicap in the progress of any nation. It is also believed that mathematics is an exceptionally difficult subject both to teach and to learn (Cockcroft, 1982) and its study requires special ability and intelligence.

Affective, cognitive and motivational factors are extrinsically linked in the learning, achievement and creativity in mathematics. Ma (1997) recommended that mathematics, especially difficult mathematics content, should be taught in an interesting and attractive manner so that students can enjoy it without feeling that learning mathematics is difficult.

All pupils can become creative if placed in a conducive environment (Sternberg,

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2006). Current emphasis on convergent thinking and rapid response has failed to keep interest in mathematics. Limiting the use of creativity in the classroom reduces mathematics to a set of skills to master and rules to memorize. Consequently, natural curiosity and enthusiasm of many children for mathematics disappear as they get older, creating a tremendous problem for mathematics educators who are trying to instill these very qualities (Meissner, 2008). Keeping students interested and engaged in mathematics by recognizing and valuing their mathematical creativity may increase interest in mathematics.

The creative children use their common-sense knowledge very intensively. They very often react unconsciously, spontaneously develop new ideas, and often we can detect a 'cognitive jump' (Meissner, 2008). Mathematical creativity is the ability to invent new or important ideas, discover new relationships, imagination (visual / spatial abilities), flexibility, modify given techniques and to connect the fields of experiences. Mathematically creative children exhibit social aspects like communication, cooperation, team work, the ability to convince or argue, motivation and self-confidence (Meissner, 2008). Teachers wishing to improve student motivation towards mathematics should include lessons that allow for more student involvement and task orientation (Opolot-Okurut, 2010).

Research findings suggest that creativity often emerges from divergent thinking (Guilford, 1967). This thinking that moves outward from conventional knowledge or wisdom into unexplored paths and unconventional solutions. It is from this thinking that creative breakthroughs seem to emerge. In contrast, convergent thinking applies existing knowledge and rules of logic to the task of narrowing the range of potential solutions on a single correct answer. Such thinking is productive in many situations but it does not appear to foster true creativity. For Sternberg (2006), creativity is a factor of synthetic ability (divergent thinking) analytical ability (convergent critical thinking) and practical ability. Many researchers describe creativity as a product of fluency flexibility, originality and sometimes as elaboration (Torrance, 1974; Haylock, 1997 & Kim, Cho & Ahn, 2003).   According to Torrance, (1974) fluency is the number of relevant, rational responses to specific situations. Flexibility refers to the number of relevant categories in which the responses to a situation falls. Originality is the statistical uniqueness of the response. Since attitude of students towards mathematics plays an important role in the way students comprehend the subject and perform in it, can also play an important role in students' mathematical creativity.

The poor performance of mathematics in schools results from a number of factors such as students' poor attitudes, poor teaching methods, the learning environment, syllabus and curriculum, shortage of teaching resources, home and socio-economic background, inability to read and write, absenteeism, dropouts, overcrowded classrooms and assessment (Opolot-Okurut, 2008). Motivation and confidence in mathematics, anxiety in mathematics, socio-economic background, gender etc are some factors that need to be addressed to enhance the mathematical creativity of pupils in the

country. Furthermore, little attention is paid to the needs of students with poor attitude towards mathematics. The teaching and learning of mathematics and fostering mathematical creativity is therefore in urgent need for improvement in our country.

Purpose of the Study

The purpose of the study was to investigate mathematical creativity by student attitude towards mathematics in the secondary schools in Kerala. The study investigated differences in mathematical creativity by attitude towards mathematics in case of fluency, flexibility and originality scales.

Objectives

This study was guided by the following objectives :
1.   To investigate the fluency component of mathematical creativity by attitude towards mathematics.
2.   To investigate the flexibility component of mathematical creativity by attitude towards mathematics.
3.   To investigate originality component of mathematical creativity between the high attitude towards mathematics students and the low attitude towards mathematics students.

Hypotheses

This study tested the following null hypotheses:
1.   There are no differences in the fluency component of mathematical creativity by attitude towards mathematics.
2.   There are no differences in the flexibility component of mathematical creativity by attitude towards mathematics.

3.   There is no difference in the originality component of mathematical creativity between the high attitude towards mathematics students and the low attitude towards mathematics students.

Methodology

This study was focused on the secondary school students of Kerala. This study was carried out in Kannur and Thrissur districts in Kerala. These districts being in the middle and northern part of the state will give good representation to Kerala.

The sample of this study was 479 ninth standard secondary students of Kerala. Two districts namely Kannur and Thrissur were purposively selected. As the population consists of different categories like boys, girls, urban and rural schools, the investigator gave representations to these factors. The investigator gave equal representation to boys and girls in the sample. There are schools run by both government and private agencies. Hence both government and private schools were selected for the present study. Since the population was divided into strata as described above, stratified random sampling technique was used for the selection of sample.

In each school all students from two ninth standard classes (the whole class) were selected to participate in the study. In every class there are high, average and low mathematically creative students. The whole class was selected to include all categories of children. Test of mathematical creativity and student attitude towards mathematics inventory was administered to measure mathematical creativity and attitude towards mathematics of these students. Fennema &

Sherman, (1976) studied attitude towards mathematics and the scale they constructed has nine factors. Out of the nine factors, this study has selected three factors namely motivation in mathematics, confidence in mathematics and anxiety in mathematics.

Data Analysis

The scores on the Students Attitude towards Mathematics Inventory (SATMI) were used to categorize students into high attitude towards mathematics and low attitude towards mathematics students. The minimum and maximum possible scores on the instrument were 36 and 180 respectively. The overall average in the sample was found to be 98. Those students who scored above 98 points were considered as high attitude towards mathematics students. Consequently those students who scored below 98 points were considered as low attitude towards mathematics students.

The questions about differences in mathematical creativity and its components with attitude towards mathematics were addressed using quantitative analysis. Statistical analysis involved in using the statistical package SPSS for the following statistical techniques: student two-tailed t-test for independent samples was used to find if there were group differences in Fluency, Flexibility, Originality and mathematical creativity with student attitude towards mathematics. Descriptive statistics like means and standard deviations for Fluency, Flexibility, Originality mathematical creativity and student attitude towards mathematics were computed for the complete scores and for each stratum using SPSS.

Findings and Discussion

In order to test hypotheses set for this study, the mean scores on mathematical creativity for high attitude towards mathematics students were compared to the mean scores of low attitude towards mathematics students. Table 1 represents the mean scores (M) and standard deviations (SD) for mathematical creativity variables of high attitude towards mathematics students with low attitude towards mathematics students in the present study.

The mean scores on mathematical creativity for high attitude towards mathematics students were compared to the mean scores of students with low attitude towards mathematics in case of three components of mathematical creativity. In order to accomplish this comparison, an independent two-tailed t-test of equality of means was done for each mathematical creativity variable with a type I error rate of .05 for each variable. The results are given in Table 1.

The results show that high attitude towards mathematics students had a higher mean score ($M = 36.17$, $SD = 9.16$) in fluency than the low attitude towards mathematics students ($M = 27.43$, $SD = 14.51$). The standard deviations indicate that the variances of scores in high attitude towards mathematics students are different from low attitude towards mathematics students. The flexibility results show that high attitude towards mathematics students had a higher mean score ($M = 3.61$, $SD = 1.23$) in fluency than the low attitude towards mathematics students ($M = 1.34$, $SD = 1.73$). The standard

deviations indicate that the variances of scores in high attitude towards mathematics students are not very different from low attitude towards mathematics students.

The results show that high attitude towards mathematics students had a higher mean score (M = 0.71, SD = 0.47) in originality than the low attitude towards mathematics students (M = 0.24, SD = 0.64). The standard deviations indicate that the variances of scores in high attitude towards mathematics students are not very different from low attitude towards mathematics students.

Table 1

Mean Scores and Standard Deviations for Mathematical Creativity for High Attitude towards Mathematics Students and Low Attitude towards Mathematics Students and t-test Comparison of Mathematical Creativity with Attitude Towards Mathematics

	High Attitude Students		Low Attitude Students				
	M	SD	M	SD	t	df	p
Fluency	36.17	9.16	27.43	14.51	28.13*	479	0.000
Flexibility	3.61	1.23	1.34	1.73	27.18*	479	0.000
Originality	0.71	0.47	0.24	0.64	27.46*	479	0.000

* $p < 0.05$

When the mean scores on fluency variable of high attitude towards mathematics students were compared to the mean scores of low attitude towards mathematics students using an independent two-tailed t-test of equality of means, the result is t (479) = 28.13, p < .05. This result indicates that the differences between the means are significant. The null hypothesis that there are no differences in mathematical creativity by attitude towards mathematics was rejected in case of the fluency scale. Therefore there is a statistically significant difference in the fluency component of mathematical creativity between the high attitude towards mathematics students and the low attitude towards mathematics students. The mean difference in the fluency scores was 8.74 units, with the high attitude towards mathematics performing better than low attitude towards mathematics students.

When the mean scores on flexibility variable of high attitude towards mathematics students were compared to the mean scores of low attitude towards mathematics students using an independent two-tailed t-test of equality of means, the result is t(479) = 27.18, p < .05. This result indicates that the differences between the means are significant. The null hypothesis that there are no significant differences in mathematical creativity by attitude towards mathematics was rejected in case of the flexibility scale. Therefore there is significant difference in the flexibility component of mathematical creativity between the high attitude towards mathematics students and the low attitude towards mathematics students.

The mean scores on originality variable of high attitude towards mathematics students were compared to the mean scores of low attitude towards mathematics students

using an independent two-tailed t-test of equality of means. The result is t (479) = 27.46, p < .05. This result indicates that the differences between the means are statistically significant. The null hypothesis that there are no differences in mathematical creativity by attitude towards mathematics was rejected in case of the originality scale. Therefore there is significant difference in the originality component of mathematical creativity between the high attitude towards mathematics students and the low attitude towards mathematics students.

Thus, for the fluency, flexibility and originality variables of mathematical creativity, the null hypothesis that "there is no significant difference in mathematical creativity between high and low attitude towards students" was rejected. This shows that high attitude towards mathematics students were different from the low attitude towards mathematics students in all the levels of those mathematical creativity components.

Conclusions and Implications

The finding of this study is that there are significant differences in mathematical creativity by student attitude towards mathematics. The data from the mathematical creativity test analysed using t-test. The scores of each component of mathematical creativity like fluency, flexibility and originality were analyzed using t-test with the attitude towards mathematics. The results of this study indicated statistically significant differences in attitude towards mathematics in the fluency, flexibility and originality scores of mathematical creativity. The findings of the study agrees with the earlier research studies which reported significant relationship between attitude towards mathematics and mathematical creativity (Choi & Do, 2008 & Ma, 1997).

The implications of this study are that teachers should try to increase attitude towards mathematics in order to improve fluency, flexibility and originality factors of mathematical creativity. Another implication of this result is that students are not equally motivated within themselves. In the class room teachers need to translate the curriculum in terms of skills that students would find relevant and interesting (Boekaerts, 2002). Teachers could assist the students to become intrinsically and extrinsically motivated through creative teaching and relating the curriculum to real life situations. Bad teaching kills motivation and that good teaching brings out the best in students of all ages (Boekaerts, 2002).

Students will become motivated and more involved if what they learned in mathematics classes are related to real life situations. Teachers wishing to improve students' motivation towards mathematics should consider their classroom environment, because it is quite feasible that all teachers can improve the quality of their own classrooms (Opolot-Okurut, 2010). Teachers need to communicate to the students that they can learn mathematics; praise student effort and performance when deserved; employ cooperative grouping and encourage discussion of mathematics among students; when students go wrong in a problem, encourage them try again and again rather than letting them to worry about their failure. To build motivation in mathematics classrooms Boekaerts (2002) pointed out that

provide feed-back with respect to the solution plan, encourage students to exchange information about the strategies they used and allow them to learn from mistakes. Parents also should give confidence and motivation for students to learn. Teachers and parents through their exemplary behaviour should be role-models to students.

Conclusion

In order to develop mathematical creativity, most important area to be considered is to create confidence and to develop motivation to learn mathematics. Students should be encouraged to engage in challenging problems and experiences. It is the responsibility of the teachers to provide situations to have such inventions within the classroom atmosphere. It should be noted that all students are inventors and creators and the intensity of this creativity will be varied from individual to individual. Instead of neglecting or suppressing these divergent thinking, they should be converted to fruitful creations. Diversity is inevitably present in classrooms and is recognised and capitalised on by the use of cooperative teaching strategies. Students should be encouraged to communicate their thinking, to work through their ideas and those of other students, and where consideration of multiple solution methods are encouraged (flexible thinking) (Cropley, 1997). Teachers also try to avoid giving negative comments and ridiculing students in the mathematics class rooms. Instead, try to make them learn from their mistakes. This will ensure a positive attitude towards mathematics and consequently it will develop mathematical creativity.

References

Boekaerts, M. (2002). Motivation to learn. Educational Practice Series,10. Paris: UNESCO.

Choi, Y., & Do, J. (2008). Research on the characteristics of mathematically gifted students in Korea. A Paper presented for the 11th International Congress on Mathematics Education, July 6-13, 2008, Mexico.

Cockcroft, W.H. (1982) Mathematics Counts. London: HMSO

Cropley, A. J. (1997). Fostering creativity in the classroom: General principles. In M. A. Runco (Ed.), The creativity research handbook: Volume one (pp. 83-114). Cresskill, NJ: Hampton Press.

Fennema, E., & Sherman, J.A. (1976). Fennema-Sherman mathematics attitude scales: Instruments designed to measure attitude toward mathematics by females and males, Journal of Research in Mathematics Education, 7, 324-326.

Guilford, J. P. (1967). The nature of human intelligence. New York: McGraw-Hill.

Haylock, D. W. (1997). A framework for assessing mathematical creativity in school children.Educational Studies in Mathematics, 18, 59-74.

Kim,H., Cho,S., & Ahn, D. (2003). Development of mathematical creative problem solving ability test for identification of gifted in math. Gifted Education International, 18,184-174.

Ma, X. (1997). Reciprocal relationships between attitude toward mathematics and achievement. Journal of Education Research, 90, 221-229.

Meissner, H. (2008). Intutive-creative-gifted-logical. An analysis for the discussion group DG 9 at ICME 11: A paper presented for the 11th International Congress on Mathematics Education, July 6-13, 2008, Mexico.

Opolot-Okurut, C. (2008). Factors that hinder opportunities to learn mathematics in primary schools in Uganda. A paper presented for the 11th International Congress on Mathematics Education, July 6-13, 2008, Mexico.

Opolot-Okurut, C. (2010). Classroom learning environment and motivation towards mathematics among secondary school students in Uganda.Learning Environments Research: An International Journal, 13 (3), 267-277.

Sternberg, R.J. (2006). The nature of creativity.Creativity Research Journal, 18(1), 87-98.

Torrance, E. P. (1974). Torrance tests of creative thinking. Personnel Press, Xerox. Education Co.

REGULATION OF COGNITION AMONG SECONDARY SCHOOL STUDENTS

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Abstract

Metacognitive control/regulation is considered as the ability to use knowledge to regulate and control cognitive processes. Students with high metacognitive and self-regulatory abilities actively involved in their own learning process. It is important for students to be aware of their strengths and limitations as learners. In last twenty years, metacognition has been receiving increased attention in cognitive psychology. The present study aims to find out the Regulation of Cognition among Secondary School Students. The main components of Regulation of Cognition are Planning, Monitoring and Evaluation. The main tool used for the survey is Metacognitive Awareness Inventory prepared by Shraw and Dennison (1994). The result of the study indicate that the level of Regulation of Cognition among the Secondary School Students is average, there is significant difference in level of Regulation of Cognition between Male and Female and there is no significant difference in the level of Regulation of Cognition between English Medium and Malayalam Medium students.

***Keywords:** Regulation of Cognition, Planning, Monitoring, Evaluation, etc.*

Introduction

Regulation of cognition or metacognitive regulation refers to a set of activities that help students control their learning (Gavelek & Raphael, 1982; Gourgey, 1998; Hartman, 1998). Although a number of regulatory skills have been defined, three basic skills are included in all accounts: Planning, monitoring, and evaluation (Fraenkel & Wallen, 2000; Jacobs & Paris, 1987). "Planning involves the selection of appropriate strategies and the allocation of resources that affect performance. Monitoring refers to one's online awareness of comprehension and task performance. Evaluation refers to appraising the products and efficiency of one's learning (Schraw, 1998).

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Metacognitive control/regulation is considered as the ability to use knowledge to regulate and control cognitive processes. Metacognitive control is related with metacognitive activities that help to control one's thinking or learning (Ozsoy, 2008). Students having the prediction skill think about the learning objectives, proper learning characteristics, and the available time. Prediction skill enables students to predict the difficulty of a task, by this way they use that prediction to regulate their engagement related to outcome. The selection of appropriate strategies and allocation of resources closely related with the prediction skill (Desoete, 2008). Monitoring refers to one's on-line awareness of comprehension and task performance. The ability to engage in periodic self-testing while learning is a good example (Winnie 1997). Students having the evaluation skill appraise the products and regulatory processes of their learning. Students can re-evaluate their goals and conclusions. Evaluation enables students to evaluate their performance on the task, students can compare their performances with each other and they can use the result of comparison to locate the error in the solution process (Lucangeli, Cornoldi, & Tellarini, 1998). Students with high metacognitive and self-regulatory abilities actively involve in their own learning process, plan and monitor the task they are focusing on, their own study attitudes and the task and the study attitudes fits together (Zimmerman &Martinez-Pons, 1986).

Metacognitive Regulation: Metacognitive experiences involve the use of metacognitive strategies or metacognitive regulation (Brown, 2002) [16]. Metacognitive strategies are sequential processes that one uses to control cognitive activities, and to ensure that a cognitive goal has been met. These processes help to regulate and oversee learning, and consist of planning and monitoring cognitive activities, as well as checking the outcomes of those activities

It is important for students to be aware of their strengths and limitations as learners. In last twenty years, metacognition has been receiving increased attention in cognitive psychology. Specific attention has been focused on this construct as the interface between cognition and affect and its essential role in self-regulation in achievement settings (Carrell, Gajdusek, & Wise, 1998; Lucangeli & Cornoldi, 1997). Metacognition itself does not predict achievement, but theorists believe that it may serve as a mediator to learning (Braten, 1991; Bruning, Schraw, & Ronning, 1995). Highly metacognitive individuals do better than others in planning, managing information, monitoring, debugging, and evaluating (Anderson & Walker, 1991; Schraw & Dennison 1994).

Flavell (1979) stated that metacognition is "knowing about knowing". For Schraw and Dennison (1994), it is an ability to reflect, control and understand, in a self-aware mode, one's own learning and cognition. Although this term has been part of the vocabulary of educational psychologists for more than twenty years, because of the lack of a clear definition and the lack of a unified theory of metacognition, defining metacognition is not that simple. But if today metacognition is still a fuzzy concept, there is general agreement among researchers that it can be divided into two general constructs termed: metacognitive knowledge and metacognitive control and

regulation. Metacognitive knowledge refers to general knowledge about how human beings learn and process information, as well as individual knowledge of one's own learning processes. Metacognitive experiences involve the use of metacognitive strategies or metacognitive regulation (Brown, 1987). Metacognitve strategies are sequential processes that one uses to control cognitive activities, and to ensure that a cognitve goal has been met. These processes help to regulate and oversee learning, and consist of planning and monitoring cognitive activities, as well as checking the outcomes of those activities.

Metacognition is an important concept in cognitive theory. It consists of two basic processes occurring simultaneously. Monitoring your process as you learn and making changes and adapting your strategies if you perceive you are not doing so well. It is about self – reflection, self – responsibility and imitative as well as goal setting and time management. Numerous studies learn that Metacognition is important for Students learning because it affects how Students apply what they had learnt to solve problems. Metacognition has applications for many areas of school success.

Significance of the Study

Metacognition broadly defined is knowledge that a person has his own cognitive process. Metacognition entails two components: Metacognitive knowledge and Metacognitive regulation. Metacognition has studies gives an answer to the problems of the present educational practices. Metacognitive thinking is a key element in the transfer of learning and the child's

development of Metacognitive skills is termed as Meta-learning. Meta-learning and teaching strategies can help mediate the Metacognitive skills of children and stimulate children's Metacognitive thinking. There is a significant relation between learning outcomes and knowledge of specific strategies.

In science, Metacognition looks like planning strategies to use on as word problem or to design an experiment to isolate a given element. Also, Metacognition means beings able to evaluate several different strategies used in order to determine which ones worked and which ones might be the best to use in a similar situation in the future. Also Metacognition help Students to plan essays and modes of research before delivering into a large paper or term paper. Since Metacognition is thinking about thinking its use can be improve the Process Skills in Science.

Metacognition refers to our knowledge of what we know or what we know about what we know and the use of this knowledge to direst further learning activities. When engaging in critical thinking, Students need to monitor their thinking process check whether progress is being made toward an appropriate goal, ensure accuracy and make decisions about the use of time and mental effort. Students can become better thinkers and learners by developing the habit of monitoring their learning. The skills and attitudes of Metacognitive activates can be taught and learned strategies and make judgments about how efforts to allocate to a cognitive task.(Nelson,1996).

Accurate Metacognitive monitoring is necessary for effective regulation of Science Processes and these together contribute the more optimal learning. If a person does not accurately monitor his current state of learning, he may fail to study effectively. Therefore accurate monitory learning is critical.

Sometimes students experience difficulties in acquiring these competencies and behaviors due to their inability to make use of knowledge and skills and take control of their learning. This inability to self-regulate their learning and behavior often results in poor academic performance along with difficulties in social interaction. Lindner and Harris suggested that the self-regulated learner is "organized, autonomous, self-motivated, self-monitoring, self-instructing, in short, behaves in ways designed to maximize the efficiency and productivity of the learning process". Thus a careful guidance in recognizing and regulating one's own thinking processes may help learners to solve problems of their lives. Instead of telling them the solution of a particular problem it will be better to equip them with the knowledge to have a practical assessment of their own skills and cognitive processes which may enable them not only to solve the present problem but the problems throughout their lives. This concept of self-regulating of behavior is known as Metacognition.

Metacognitive strategies such as self-monitoring, knowledge of the existing problem, self-evaluation and strategy mechanism would definitely bring about revolutionary changes in the teaching learning process. The need of the hour is the total changes in the existing learning – teaching strategies and Students should be so oriented as to be discovers of knowledge. Self-discovery should be the desirable learning strategy and accordingly, the teacher should present confusing or challenging situations to the learner so that they must think a lot and find suitable solution to it. Thus the curriculum should be so rearranged as to be included by the practice of Metacognitive skills. This will facilitate better learning as well as the problem solving and their by Science Process Skills in learner should be increased. When Metacognitive strategies are effectively applied the classes would definitely and automatically become brain-storming sessions and the school a center of excellence in learning and teaching.

Objectives of the Study

1. To study the distribution of the scores on Regulation of Cognition among the Secondary school students.

2. To find out the level of Regulation of Cognition among Secondary school students.

3. To find out the significance difference if any between the Means of the scores on Regulation of Cognition among

A. Boys and Girls of Secondary school students

B. English medium and Malayalam Medium of Secondary school students

Hypotheses of the Study

The hypotheses formulated for the present study were:

i. The distribution of Regulation of Cognition of Secondary school students is approximately equal.

ii. There exists a significant difference in the Means of the Scores on Regulation

of Cognition among Boys and Girls of Secondary school students.

iii.   There exists a significant difference in the Means of the Scores on Regulation of Cognition among English medium and Malayalam medium students

Methodology

Normative survey method is adopted for the conduct of present study. The present study consists of sample of 60 Secondary school students randomly selected out of the total population in Kottayam District. Selection of sample is according to gender and medium of instruction.

The Metacognitive awareness inventory Prepared by Schraw, G & Dennison, R.S (1994) was administered to selected samples. The inventory have 52 statements, out of this 32 statements related to knowledge of regulation and 17 belongs to knowledge of cognition. Here the investigator takes only the statements relates to Regulation of Cognition. They are

(a) Planning

Planning, goal setting, and allocating resources prior to learning

(b) Information management strategies

-Skills and strategy sequences used to process information more efficiently(e.g, elaborating, summarizing, selective focusing

(c) Comprehension Monitoring

-Strategies used to correct comprehension and performance errors

(d) Debugging strategies

-Strategies used to correct comprehension and performance errors

(f) Evaluation

-Analysis of performance and strategy effectiveness after a learning episode.

Sample of the Study

The study conducted on a representative sample of 60 Secondary school students of Kottayam district by using a Stratified Random Sampling technique giving due representation to Gender and Medium of Instruction

Tools

Metacognitive Awareness Inventory developed and Standardized by Shrew and Dennison (1994).

Statistical Techniques Used

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

1. Mean

2. Standard deviation

3. 't' –test

Analysis and Interpretation

Table 1

The Distribution of scores of Regulation of Cognition among Secondary School student

Class interval	Frequency	Percentage
10-15	1	1.2
15-20	2	3.33
20-25	25	41.66
25-30	22	36.67
30-35	10	16.66
TOTAL	60	100

The first objective was to find out the distribution of Regulation of Cognition among

the Secondary School Students. From the table values it is interpreted that highest number of student fall in the class interval of 20-25. The tables show that the scores are accumulated towards the central scores 25. This shows that the Regulation of Cognition is normally distributed among the samples. By using the Mean and standard deviation of the scores it is easy to classify the students according to their Regulation of Cognition. Majority of students (41.66%) have moderate Metacognitive Regulation. Only 16.66% of students have high Metacognitive Regulation. Since the majority of students belong to average level. It is concluded that Knowledge of Regulation among Secondary School Students is not high but average.

Table 2

Regulation of cognition among Secondary School Students with respect to Gender.

Variables	Category	N	Mean	S.D	t-value	Remarks
Regulation of Cognition	Male	29	23.69	2.573	2.517	significant at .05 level
	Female	31	26.32	5.075		

Table 3

Regulation of Cognition among Secondary School Students with respect to medium of instruction

Variables	Category	N	Mean	S.D	t-value	Remarks
Regulation of Cognition	English medium	31	24.59	4.355	0.819	Not Significant at .05 level
	Malayalam medium	29	25.45	4.130		

Table -2 Shows that the mean scores of Male and female are 23.69 and 26.32 with standard deviation of 2.523and 5.075 respectively. The obtained t- value is 2.517 is higher than the theoretical t-value 1.96 at 0.05 level of significance. Hence the hypothesis -3 that there is significant difference between Regulation of Cognition among Boys and Girls is accepted. The mean scores of female students are higher than that of male students. So the Female students having good Regulation of Cognition than the Male students.

It is clear from the table-3 that the t-value is less than the 1.96 at 0.05 level of significance. It shows that there is no significant difference in Regulation of Cognition among the English Medium and Malayalam medium Students. The Mean scores of English medium and Malayalam Medium students are almost same.

Major findings of the study

1. The distribution of Regulation of Cognition among students is normally distributed.

2. Most of the students have moderate Regulation of Cognition.

3. There is significant difference in Regulation of Cognition among Boys and Girls. Girls having good Regulation of Cognition than Boys.

4. There is no significant difference in Regulation of Cognition among English medium and Malayalam medium students. The medium of instruction have no effect on Regulation of Cognition.

Conclusion

The present study reveals that the Regulation of Cognition or Metacognitive Regulation is average in secondary school students. Students must assume increasing responsibility for planning regulating their learning. It is difficult for learners to become self-directed when learning is planned and monitored by someone else. Students can be taught to make plans for learning activities including estimating time requirements, organizing materials and scheduling procedures necessary to complete an activity. The resource center's flexibility and access to a variety of materials allows the Students to do just this. Criteria for evaluation must be developed with Students so that they learn to think and ask questions of themselves as they proceed through a learning activity. Closure activities focus Students' discussion on thinking processes to develop awareness of strategies that can be applied to other learning situations. Guided self-evaluating experiences can be introduced through individual conferences and checklist focusing on thinking process. Gradually self-evaluation will be applied more independently. As Students recognize that learning activities in different, disciplines are similar, they will begin to transfer learning strategies to new situations.

References

Bayer Barry, K. (1987). Practical Strategies for the Teaching of Thinking. U.S.A: Allyn & Bacon.

Bell, T. (1963). Metacognition and its Dimension in School and Outside. San Francisco: Jossey Bass.

Govil Punitha.,& Rani Rekha.(2013). Metacognitive and its Correlates: A Study.International Journal of Advancement in Education and Social sciences 1:1. IROSSS., pp 20-25.

Harriet Salatas Waters. & Wolfgung Schncider. (2010). Metacognition, Strategy use and Instruction. Newyork: The Guiford press.

Lokanadha Reddy, G., & Shanthakumari, P. (2004) English language Learning Difficulties: Metacognitive Awareness of students. Edutraks 3(12) pp31-35.

Mathew, T.K. (2013). Teacher Education to Contemporary Learning. Thiruvalla: Lilly Pubishing house.

Mskini Hbiben. &Safar Yahya. (2016). The effect of Metacognitive Instruction on Problem Solving skills in Iranian Students of health Sciences. Global Journal of Health Science 8:1.Canadian Center of Science Education. Pp 43-51

Pina, Tarricone. (2011).Taxonomy of Metacognition.Newyork: Psychology Press.Taylor and Francis Group.

Remadevi, K. (2010). Relation between Metacognitive Awareness and Achievement in Physics at Higher secondary level. International Educator 22:1. Thiruvananthapuram, Kalanikethan.pp 37-41

Shareeja Ali, M.C. (2010). Metacognition: Concepts and its development Edutraks 9(9). Hyderabad, Neelkamal publicationsPvt.Ltd. pp.10-13.

Simon Philip., & Babu,R.(2008). Metacognitive Awareness of Teacher Trainees In Kerala. International Educator 20:2 Thiruvananthapuram, Kalanikethan. pp 19-21.

Thomas, Shimitha. (2011). A study on Metacognition and Problem solving Skills among the Students of Higher secondary schools of Kottayam Disrict. Unpublished M.Ed. Dissertation, Mahatma Gandhi University, Kottayam.

EFFECTIVENESS OF GRAPHIC ORGANIZER AS A META COGNITIVE CLASSROOM PRACTICE ON THE ACADEMIC ACHIEVEMENT AND THE META COGNITIVE AWARENESS OF MALAYALAM LANGUAGE STUDENTS AT SECONDARY LEVEL THROUGH THE IMPLEMENTATION OF CALLA MODEL

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Abstract

A graphic organizer is a visual and graphic display that depicts the relationship between facts, terms or ideas within a learning task. These organizers activate and engage learners in the instructional process and enable them to capture and focus their attention in an exciting way. Constructivist approaches to learning and teaching have become increasingly influential concepts over the past few decades and attention has increasingly focused on how we learn, as well as what we learn. The intellectual dimension namely Meta cognitive dimension of student learning enters to their cognitive readiness through the mode of self-regulated learning which is capable for making them responsible for managing their own learning.This study tries to find out the effectiveness of Graphic Organizer on the academic achievement and meta cognitive awareness of Malayalam language students.This study reveals that 'Planning,' the major component of Meta cognition enabled the learners to internalize the learning goals   and emphasized a clear-cut way for reaching the desired target. 'Monitoring' kept them in the track and acted as an exemplar of sustaining motivation among the students. From this study, we can conclude that Graphic organizers are powerful and excellent instructional tools, which help to instill Meta cognition among the learners. These pictorial representations allow students to brainstorm ideas and organize them into manageable and comprehensible chunks.

Key words: Meta cognition, Graphic Organizer, CALLA Model, Meta cognitive awareness, etc.

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Introduction

According to the dual coding theory of information storage, knowledge is stored in two forms – linguistic and imagery. The imagery mode of information storage is referred to as graphic organizers or non-linguistic representations. A graphic organizer is a visual and graphic display that depicts the relationship between facts, terms or ideas within a learning task. These organizers activate and engage learners in the instructional process and enable them to capture and focus their attention in an exciting way. Constructivist approaches to learning and teaching have become increasingly influential concepts over the past few decades and attention has increasingly focused on how we learn, as well as what we learn (Downing 2010). The intellectual dimension namely Meta cognitive dimension of student learning enters to their cognitive readiness through the mode of self-regulated learning which is capable for making them responsible for managing their own learning.

Review of Related Studies

Snyder and Solomon (2012) conducted a study, which aims to investigate the effects of graphic organizers, level of text structure complexity and content familiarity on second grade students' comprehension, recall and sensitivity to cause/effect text structure. Suarez (2011) conducted a study that sought to identify which graphic organizers and higher order thinking skills would aid in students test scores in a district impacted by poverty and a high level of second language learners. The foundation of this study was predicated on cognitive theory, constructivism and the use of graphic organizers. In the preset context, the investigator adopted Graphic Organizer as a classroom practice with a view to enhance student's cognitive and Meta cognitive abilities through familiarizing the advantages of   pictorial formats for processing varied modes of learning in classrooms.

Statement of the Problem

Effectiveness of Graphic Organizer as a Meta cognitive classroom practice on the academic achievement and the Meta cognitive awareness of Malayalam language students at secondary level through the implementation of CALLA model

Hypotheses of the study

The select Meta cognitive classroom practice, namely Graphic Organizer, is better than the prevailing activity oriented modes of curriculum transaction in enhancing academic achievement of Malayalam language students at secondary level.

The select classroom practice namely, Graphic Organizer is better than the prevailing activity oriented modes of curriculum transaction in enhancing the Meta cognitive awareness of Malayalam language students at secondary level.

Objectives of the study

To find out the effectiveness of select Meta cognitive classroom practice, namely Graphic Organizer in enhancing academic achievement of Malayalam language students at secondary level.

To find out the effectiveness of select Meta cognitive classroom practice, namely Graphic Organizer in enhancing Meta cognitive awareness of Malayalam language students at secondary level.

Sample selected for the study

165 Secondary school students from four schools belong to three districts of Kerala namely, Pathanamthitta, Alappuzha and Kottayam were selected as experimental and control groups.

Methodology adopted for the study

In the present study, a mixed method of research design, incorporating both quantitative and qualitative data collection and analysis was used. Integrating these two methods simultaneously provided the study with new insights, consistency in findings and detailed results that helped to cancel out the weaknesses of both quantitative and qualitative research techniques

Research design

A pre test posttest non-equivalent non-group design was selected for the study.

Tools employed for the study

Lesson transcript based on the select Meta cognitive classroom practice, Graphic Organizer

Meta cognitive awareness rubric

Achievement test on language learning

Procedure adopted for the study

In order to familiarize the students with the processes embedded in the select classroom practice - Graphic organizer -they were led through the instructional sequence suggested by Chamot and O' Malley (1990) which is portrayed   in the Figure 1.

PURPOSE OF CALLA

* Focus the learner
* Improve academic language proficiency
* Motivate with content topics
* Teach learning strategies.

Figure 1
CALLA Instructional sequence.

The five phases recursive instructional cycle of CALLA (Cognitive Academic Language Learning Approach) are illustrated in the Figure 2.
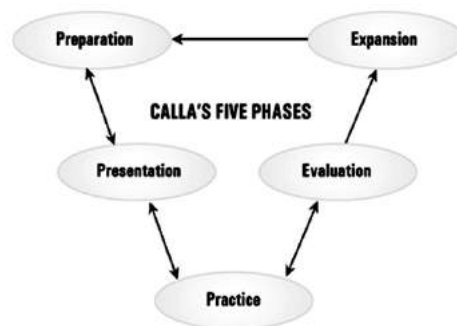
Figure 2
Schematic Representation of CALLA

The stages are explained below in detail.

Stage 1. Preparation stage: The purpose of this phase was to help students to elicit their prior knowledge about the use of learning strategies and identify the strategies they are already using in order to develop

their Meta cognitive awareness. The highlight of this stage is depicted in Figure 3.

Figure. 3
Highlights of the 'Preparation' stage.

Stage 2. Presentation: The second stage, namely 'presentation' comprises of demonstrations of the particular classroom practice before the learners. Modeling and discussion, application of the practice explicitly through examples are the core features of this stage. The highlight of the stage   is portrayed in Figure 4.
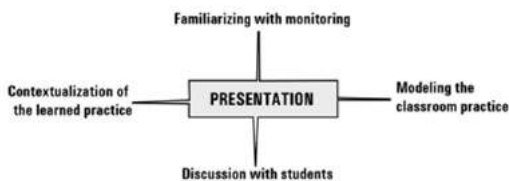
Figure 4
Highlights of the 'Presentation' stage.

Stage 3. Practice: During the third phase 'Practice', learners are divided into groups and are immersed in the experience with sequenced instruction. There were opportunities to practice new information and skills in a variety of ways by involving the spontaneous contribution of ideas from all members of the group. The highlights of this stage are given in Figure 5.

Figure 5
Highlights of 'Practice' stage.

Stage 4. Self Evaluation: This phase stands out as one of the most comprehensive parts of the learning cycle and it captures the relevance of the instructional practice to be followed and its effectiveness in a contextual setting. The main set target of this phase was to provide students with opportunities to evaluate their own success and strengthen their insights through developing their Meta cognitive awareness. The major components included in this stage are shown in Figure below.

Figure 6
Highlights of 'Self Evaluation' stage.

Stage 5 Expansion: This final phase really meant for the transfer of skills learned in a particular learning context to another new situation. Learners are in a position to extend the usefulness of classroom practices by applying it to new contexts and devise their own individual combinations with regard to the pictorial representations of ideas and interpretations of the select Meta cognitive classroom practice. The points inculcated in this stage are given in Figure 7.

Figure 7
Highlights of the 'Expansion' stage.

Each stage of this classroom practice shed light on the strengths of highly explicit instruction in familiarizing the Meta cognitive strategies towards maximizing the intended outcome of the learning task and gradually learners can begin to assume greater responsibility in selecting and applying appropriate graphic organizers. The effectiveness of the classroom practice on the academic achievement of   students selected for the study was analyzed by comparing the pre test and post test achievement scores of experimental group and the control group .

Table 1

Descriptive statistics of pretest and post test achievement scores of total students in experimental and control group.

Variable	group	N	AM	SD	SE	LCL	UCL
pretest	Control	83	4.33	1.83	0.20	3.93	4.72
	Expt.	82	4.78	2.24	0.25	4.29	5.27
Post test	Contl	83	9.17	1.83	0.20	8.77	9.57
	Expt.	82	22.30	4.54	0.50	21.31	23.

From table 1, it is understood that the pre test achievement scores in the control group and in the experimental group are approximately equal to the population mean.

Determining the effectiveness using ANCOVA. ANCOVA with pre experimental status in achievement as co variate was employed to investigate the effectiveness of the Meta cognitive classroom practice, G.O in improving academic achievement of secondary school students over present activity oriented modes of curriculum transaction. The details are given in Table 2.

Table 2

ANCOVA of pos test achievement scores by eliminating the effect of pre test achievement scores of total students in experimental and control group.

Variable	SV	SS	df	MSS	F	P
Adj. post test	BV	6920.42	1	6920.42	586.77**	<0.01
	wv	1910.63	162	11.79		
	T	8831.06	163			

**: Significant at 1% level (P<0.01), R squared=0.789(Adjusted R Squared=0.787)

ANCOVA shows that the experimental and control group differ significantly in the post test achievement scores after eliminating the effect due to their initial pre test achievement scores (F=586.77, P<0.01). It can be inferred from the ANCOVA that the experimental group performed better than the control group with respect to the academic performance of students at secondary level in their Malayalam language learning. Comparative bar diagram of pre test, posttest and Adj. posttest achievement scores of total students in experimental and control group are given below.
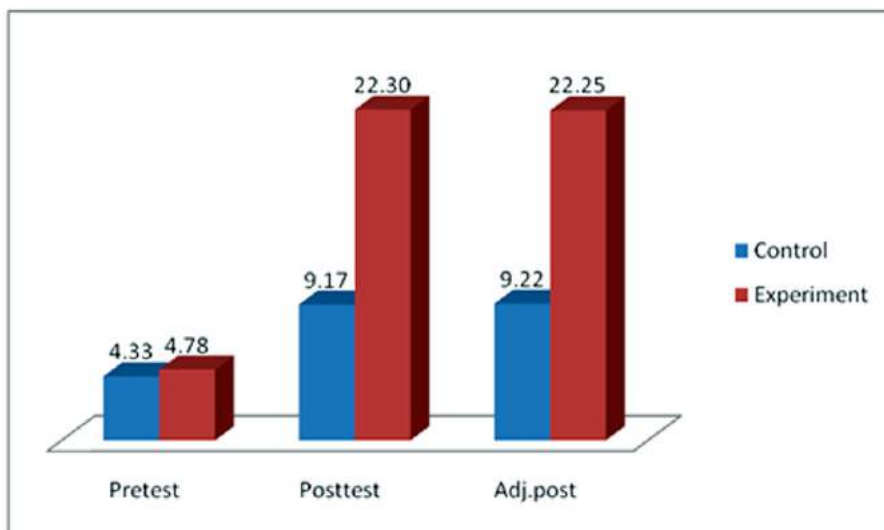
Figure 8

Comparative bar diagram of pre test, posttest and Adj. post test achievement scores of total students in experimental and control group.

The graph indicates that the students who were exposed to the select Meta cognitive classroom practice namely; Graphic Organizer showed significant improvement in their academic achievement in Malayalam over their counterparts in the control group who were exposed to the prevailing activity oriented modes of curriculum transaction.

Analysis of the effectiveness of Graphic Organizer on strengthening the Meta cognitive awareness of students

A Self assessment Rubric was employed for this purpose which comprised of various criterion levels of awareness like, 'Exceeds Expectations',(E.E) 'Meets Expectations,' (M.E) 'Partially Meets Expectations' (P.M.E) and 'Doesn't Meet Expectations.' (D.M.E). The results shows that none of the students deserves the categorization, 'Exceeding Expectation' with

regard to the selected components of Meta cognition of both control and experimental groups. A negligible proportion of students from both control and experimental groups could be categorized as the strata, 'Meet Expectations'. The following section deals with the analysis of the post scores of total students with respect to their Meta cognitive awareness.

Analysis of self-assessment of secondary school students on their Meta cognitive awareness-Re administration of the Rubric

After the intervention, the variations in the attainment level of Meta cognitive awareness of secondary school students were found out by re administering the Meta cognitive awareness rubric to both control and experimental groups. The change in perceptions of students is detailed in the Table 3.

Table 3

Comparison of post scores of students in experimental and control groups   with regard to their Meta cognitive awareness.

Levels of performance	E.E Contl.	E.E Exptal	M.E Contl.	M.E Exptal	P.M.E Contl.	P.M.E Exptal	D.M.E Contl.	D.M.E Exptal
Planning	Nil	2	4	23	16	45	80	30
Monitoring	Nil	2	3	21	10	50	87	27
Evaluation	Nil	1	4	20	3	51	93	28
Average	Nil	1.66	3.66	.21.33	9.66	48.66	86.66	28.33

By referring the Table, it can be noted that there is no significant changes in the levels of learners in the control group. However, in the case of experimental group levels of learners under M.E, E.E P.M.E categories have increased considerably and the levels of learners under D.M.E category have decreased.

Summary and conclusions: 'Planning,' the major component of Meta cognition enabled the learners to internalize the learning goals   and emphasized a clear-cut way for reaching the desired target. 'Monitoring' kept them in the track and acted as an exemplar of sustaining motivation among the students. Considerable discussions about the process of learning and the participatory mode of evaluation energized the learners to become authentic about the most important component of self-directed learning, 'Evaluation'. Conceptual and strategic essence of lesson become more evident through these excellent tools which assist the learners in sorting, organizing, and arranging ideas in a clear pattern. From this study, we can conclude that Graphic organizers are powerful and excellent instructional tools, which help to instill Meta cognition among the learners. These pictorial representations allow students to brainstorm ideas and organize them into manageable and comprehensible chunks. These visual tools are relatively easy to implement and a rewarding element in the instructional practitioners' repertoire of skills with regard to curriculum transaction.

References

Smith,K.A;Sheppard,S.D (2005).Pedagogies of engagement: classroom based practices. Journal pf Engineering Education. 94,87-101.

Suarez, K.(2011). Graphic organizers and higher order thinking skills with nonfiction text. (Doctoral Dissertation, Waldon University, Minnesotta, USA.UMI number.3482475.

O'Malley, M.J.&Chamot, A.U.(1990) Learning strategies in second language acquisition. Cambridge: Cambridge University Press

Solomon,P;Synder A.E(2012).The effect of graphic organizers and content familiarity on second graders ' comprehension of cause / effect text.(Doctoral dissertation, Columbia university, USA).

AWARENESS OF THE ROLES OF THE SOCIAL WORKERS IN THE REHABILITATION OF PEOPLE WITH DISABILITIES AMONG AFIJIO LOCAL GOVERNMENT SERVANT, OYO STATE

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Abstract

This study examined the awareness of the roles of the social workers in the rehabilitation of people with disabilities. The descriptive survey was used and the population used comprised of fifty (50) people with disabilities from Afijio Local Government of Oyo State, were randomly selected for the study. The instrument used was self-structured questionnaire to elicit the opinions from the respondents through sampling technique. It was analyzed using chi-square to deduce final findings from the analysis. The recommendations were made to all tiers of governments to fortify more efforts and inject more funds to rehabilitate the life of the people with disabilities.

Keywords: Social Workers, Disabilities, Impairment and Rehabilitation, etc.

INTRODUCTION

Social work is a professional and academic discipline that seeks to improve the quality of life and subjective well-being of individuals, groups, and communities through research, policy, community organizing, direct practice, crisis intervention, and teaching for the benefit of those affected by social disadvantages such as poverty, mental and physical illness or disability, and social injustice, including violations of their civil liberties and human rights.

Social Worker is protected by law and only those who have undergone approved training at university either through a Bachelor or Masters degree in Social Work and are registered with the appropriate regulatory body may practice social work and

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be called a social worker. Social workers typically undergo a systematic set of training and qualifications that are distinct from those of social care workers, care assistants or social care workers, who may undertake a social work role but not necessarily have the qualifications or professional skills of a qualified social worker.

Social workers can work in different fields both government and non-governmental organizations where they provide various services to people including people with disabilities. In the Department of Social Welfare, which is housed in the Ministry of Health and Social Welfare, over and above provision of generic social welfare services, social workers' roles include preventive, curative and rehabilitative services for both normal and with people with disabilities. Disability care includes improving capacity for caregivers and parents to care for their disabled children and facilitating integration of disabled children into mainstream schools and other social settings. Ithuseng Vocational Rehabilitation Centre which falls under the Rehabilitation Unit of the Ministry was established in 1991 as a response to the realization that disability perpetuates poverty. The Centre provides support to adults and youth with any form of disability by providing vocational guidance and training, literacy and numeracy training skills, technical skills in metal work, leather work, carpentry, sewing, knitting, agriculture, general repair skills and basic training in business management. With the devastating effects of HIV/AIDS in the country, social workers have also provided information about the pandemic to people with disabilities. They have encouraged them to know their

status and seek relevant treatment from hospitals. The Department of social welfare has also provided public assistance to the poor and vulnerable people with disabilities.

Social workers usually help the patients and their families prepare for returning to their homes after discharge. As Zastrow (2000) rightly notes, discharge planning is especially vital in some rehabilitation settings, such as hospitals. In a case that a person with disability cannot return home, placement in some other setting must be arranged, such as in a nursing home or a group home. Social workers also make sure that the discharged patient adheres to the medication regime after discharge to avoid relapsing.

Social workers also provide counselling to people with various forms of disabilities to help them adjust to their disability. In this context, counselling usually involves a wide range of problems such as personal, interpersonal, family, financial, vocational adjustment and educational adjustment. In some situations, social workers do not always provide counselling to people with disabilities directly, especially if the disabled is a young child. Instead, social workers provide counselling to the family of the person with disability, and other close parties such as siblings, peers and relatives. Working with the family is initiated to help them understand the nature of a disability and the prognosis, to make the essential adjustments to help the PWD and to deal with personal and interpersonal concerns associated with the disability (Zastrow, 2000).

Rehabilitation process is a process to restore one to his/her former state, reputation, possession, status and others.

Another role for social workers is to raise awareness of issues of disability in the country. As noted earlier on, there are still negative connotations about disabilities in the country hence social workers must be in the forefront of highlighting the plight of people with disabilities. This can also be linked to the advocacy role whereby social workers can lobby government to pass legislation specifically targeting people with disabilities.

People with disabilities often need a variety of services from other community agencies, such as provision for financial assistance, wheelchairs, and prosthetic services as well as transportation. Social workers link people with disabilities with community resources. Social workers in the Department of Social Welfare are responsible for collaborating with NGOs like World Vision, Red Cross Society and other organizations that provide assistance to people with disabilities. These organizations have poverty alleviation programmes for people with disabilities. However, in a personal interview on 24 April, 2010 with Ms. T. Tsuinyane, the Principal Social Worker, the Department of Social Welfare's main challenges include severe shortages of staff given the increasing demand for services, particularly for orphans, other psychosocial support services and people with disabilities.

Disability refers to the limited activities caused by the impairment which may be physical, cognitive, mental, sensory, emotional, developmental, or some combination of these. A disability may be present from birth, or occur during a person's lifetime. It is an umbrella term, covering impairments, activity limitations, and participation restrictions.

Impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. Thus, disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives.

Impairment refers to loss or abnormality of development or growth of a particular part of the body. For example, a boy who is born with one partially developed arm or leg is said to have a physical impairment. He can be described as physically impaired. Likewise, a man who lost his sight as a result of a head injury sustained in a motor accident can be described as a visually impaired. People with disability are a set of people encountering limitation in executing a task or action by an individual in involvement in life situations.

Research and the practice of social worker focused on areas such as: human disability development, civil servants circle, psychosocial, psychotherapy, counselling, social policy, public administration, social program evaluation, and community development. Social workers are organized into local, national, continental, and international professional bodies. It is an interdisciplinary field that incorporates theoretical bases from economics, education, sociology, law, medicine, philosophy, politics, anthropology, and psychology

STATEMENT OF THE PROBLEM

This situation therefore makes it necessary to investigate further the awareness of the roles of Social Workers in

the Rehabilitation of people with disabilities to better their lives. With the involvement of social worker makes the lives of people with disabilities are improved through the rehabilitation methods adopted by these people.

PURPOSE OF THE STUDY

This refers to the objectives which the researcher intends to accomplish through the study.

i.   To identity that the rehabilitated people live independent life through the efforts of social workers

ii. To identify that the people with disabilities gain full employment after the rehabilitation by social workers

iii. To identity that the people with disabilities contribute their quotas to the economy after the rehabilitation by social workers

iv. To identity that the people with disabilities serve as employers of labour in the society

SCOPE OF THE STUDY

This study would have merited a more royal success than this if not for certain parasitic variables which rolled in as in the wheel of the researcher's progress. There are some of the problems made it difficult to achieve the results as expected:

i.   Ethnical issues are some of the limitations that may arise in this work, the correct honesty and ingenuity of data can be ascertained

ii. Non-response factor is one of the problems that this methodology will have to contend with. The attitudes of the respondents to the questionnaire were

that they felt that it would disturb their legal duties as well as expose them. Some respondents snubbed the researcher; some lost their copies of the questionnaire while other submitted late.

iii. Limited time for the completion of the work that is time constraint

iv. The work is self sponsored and it is constrained by budget that will enable it achieve the true outcome which requires intensive capital.

v.   Inaccessibility to the information can contribute to the problem of limitations

SIGNIFICANCE OF THE STUDY

When talk of significance, it is important in the sense that social workers contribute positively to the trends of events in the society. It is an inevitable as the driving force for the changes of development. This project work is significant in the sense that with the contributions of social workers in the life of people with disabilities make the lives of people with disabilities easily, self-reliance, have independent lives useful to them and to the society at large

THEORETICAL FRAMEWORK

The concept of charity goes back to ancient times, and the practice of providing for the poor had roots in many ancient civilizations and world religions. Even before the rise of modern European states, the church was providing social services. The earliest organized social welfare activity of the Christian church was the formation of burial societies, followed closely by provision of alms to the poor, shelter for the homeless, and care and comfort for the sick. Monasteries often served as comprehensive

social service agencies, acting as hospitals, homes for the aged, orphanages, and travelers' aid stations. It was not until the emergence of industrialization and urbanization that the informal helping systems of the church and family began to break down and organized social welfare services emerged to supplant it.

The profession of social work is generally considered to have developed from three movements: the Charity Organization Society (COS) movement, the settlement house movement, and a third, less clearly defined movement, the development of institutions to deal with the entire range of social problems. All had their most rapid growth during the nineteenth century, and all grew out of the church (Donovan, 2012).

Social work has its roots in the social and economic upheaval wrought by the Industrial Revolution, in particular the societal struggle to deal with poverty and its resultant problems. Because poverty was the main focus of early social work, it was intricately linked with the idea of charity work (Schwingel, Niti, Tang, and Ng, 2009). For instance, it is common for modern social workers to find themselves dealing with consequences arising from other "social problems" such as racism, sexism, homophobia, and discrimination based on age or on physical or mental disability (Schwingel, Niti, Tang, and Ng, 2009).

Whereas social casework started on a more scientific footing aimed at directing and reforming individuals, other models of social work arising out of the Settlement House movement, led by activists such as Jane Addams, emphasized political activism and

community solutions. Currently, social work is known for its critical and holistic approach to understanding and intervening in social problems. This has led, for example, to the recognition of poverty as having a social and economic basis rooted in social policies rather than representing a personal moral defect. This trend also points to another historical development in the evolution of social work: once a profession engages in social control, it is directed at social and personal empowerment. This is not to say that modern social workers do not engage in social control (consider, for example, child protection workers), and many, if not most, social workers likely would agree that there is an ongoing tension between these forces within the profession. For example, see the debate between structural social work and humanistic social work ((Schwingel, Niti, Tang, and Ng, 2009).

PRACTICE AND ROLE OF THE PROFESSIONAL

Social work is an interdisciplinary profession, meaning it draws from a number of areas, such as (but not limited to) psychology, sociology, criminology, economics, ecology, education, health, law, philosophy, anthropology and counselling or colloquially known as psychotherapy. It is not a 'single model', such as that of health; followed by medical professional such as nurses and doctors, thus, social work requires study and continued professional development to retain knowledge and skills in practice.

The main tasks of professional social workers may include a number of services such as case management (linking clients

with agencies and programs that will meet their psychosocial needs - common in the US and the UK), counseling and psychotherapy, assessment and diagnosis of mental disorders, child protection/welfare, human services management, social welfare policy analysis, policy and practice development, community organizing, international, social and community development, advocacy, teaching (in schools of social work), and social and political research.

A historic and defining feature of social work is the profession's focus on individual well-being in a social context and the well-being of society. Social workers promote social justice and social change with and on behalf of clients. The term client is used to refer to individuals, families, groups, organizations, or communities (Olkin, 2012). In the broadening scope of the modern social worker's role, some practitioners have in recent years traveled to war-torn countries to provide psychosocial assistance to families and survivors (Olkin, 2012).

Types of disability

> Sensory disability
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> Vision impairment
>
> Hearing impairment
>
> Olfactory and gustatory impairment
>
> Somatosensory impairment
>
> Intellectual disability

Discrimination in employment

The US Rehabilitation Act of 1973 requires all organizations that receive government funding to provide accessibility programs and services. A more recent law,

the Americans with Disabilities Act of 1990 (ADA), which came into effect in 1992, prohibits private employers, state and local governments, employment agencies and labor unions from discriminating against qualified individuals with disabilities in job application procedures, hiring, firing, advancement, compensation, job training, or in the terms, conditions and privileges of employment. This includes organizations like retail businesses, movie theaters, and restaurants. They must make reasonable accommodation to people with different needs. Protection is extended to anyone with (a) a physical or mental impairment that substantially limits one or more of the major life activities of an individual, (b) a record of such an impairment or (c) being regarded as having such an impairment. The second and third criteria are seen as ensuring protection from unjust discrimination based on a perception of risk, just because someone has a record of impairment or appears to have a disability or illness (e.g. features which may be erroneously taken as signs of an illness). Employment protection laws make discrimination against qualified individuals with a disability, illegal and may also require provision of reasonable accommodation (NASW, 2005). Reasonable accommodations includes changes in the physical environment like making facilities more accessible but also include increasing job flexibility like job restructuring, part-time or modified work schedules or reassignment to vacant position. Though many hold attitudes that are more enlightened and informed than past years, the word "disability" carries few positive connotations for most employers. Negative attitudes by employers toward potential employees with disabilities can lead to

misunderstanding and discrimination (Arditi & Rosenthal, 1998).

African Americans and disability

According to the 2000 U.S. Census, the African American community has the highest rate of disability in the United States at 20.8 percent, slightly higher than the overall disability rate of 19.4% (United Nations, 2012). In comparison to the percentage of White Americans with disabilities, African Americans nearly doubles and is more likely to have one or more disabilities. Given these statistics, it can be suggested that African Americans with disabilities experience the most severe underemployment, unemployment, and under education compared to other disability groups (United Nations, 2012).

Social Security Administration

The US Social Security Administration defines disability in terms of inability to perform substantial gainful activity (SGA), by which it means work paying minimum wage or better. The agency pairs SGA with a listing of medical conditions that qualify individuals for disability benefits.

Disability and poverty

There is a global correlation between disability and poverty, produced by a variety of factors. Disability and poverty may form a vicious circle, in which physical barriers make it more difficult to get income, which in turn diminishes access to health care and other necessities for a healthy life (Donovan 2012). The World report on disability indicates that half of all disabled people cannot afford health care, compared to a third of non-disabled people.

Disability and disasters

There is limited research knowledge, but many anecdotal reports, on what happens when disasters impact people with disabilities (Bites, 2011). Individuals with disabilities are greatly affected by disasters (Bites, 2011). Those with physical disabilities can be at risk when evacuating if assistance is not available. Individuals with cognitive impairments may struggle with understanding instructions that must be followed in the event a disaster occurs. Those who are blind, hearing impaired and others may have difficulty communicating during the emergency. All of these factors can increase the degree of variation of risk in disaster situations with disabled individuals (Myers, Sweeny and Witmer, 2000).

Research studies have consistently found discrimination against individuals with disabilities during all phases of the disaster cycle (WAI, 2013). The most common limitation is that people cannot physically access buildings or transportation, as well as access disaster-related services. The exclusion of these individuals is caused in part by the lack of disability-related training provided to emergency planners and disaster relief personnel (WAI, 2013).

HYPOTHESES OF THE STUDY

The hypotheses define the state of mind of the researcher regarding possible reasons for a problem or a solution. There are usually two hypotheses referred to as H_0 and H_1.

H_0 is the null hypothesis and H_1 is the alternate hypothesis. For this case, we formulate a hypothesis H_0 which will be rejected and H1 which will be accepted based on the Chi-square analysis.

H_0: the people with disabilities do not live independent life through the efforts of social workers.

H_1: the people with disabilities live independent life through the efforts of social workers

H_0: the people with disabilities do not gain full employment after the rehabilitation by social workers.

H_1: the people with disabilities gain full employment after the rehabilitation by social workers.

H_0: the people with disabilities do not contribute their quotas to the economy after the rehabilitation by social workers.

H_1: the people with disabilities contribute their quotas to the economy after the rehabilitation by social workers.

H_0: the people with disabilities do not serve as employers of labour in the society.

H_1: the people with disabilities serve as employers of labour in the society.

MEHODOLOGY

In this chapter, the various steps employed in collecting the data for the study will be explained in details. This chapter will be examined under the following headings.

i.   Research Design
ii.   Population of the Study
iii. Sample and Sampling Techniques
iv.   Research Instrument
v.   Validity of the Research Instrument
vi.   Reliability of the Instrument
vii. Research Procedure
viii. Procedure for data Analysis

RESARCH DESIGN

Research is the plan, structure and strategy of investigation conceived as to obtain answers to research questions and to control variance. If the process of conducting a research about a phenomenon is likened to the process of building a house, the research design can therefore be regarded as the foundation laying process. The design is systematically followed, objectively examined, sequentially organized and properly displayed.

The study is therefore the descriptive survey. Its aims are to look into the impacts of awareness of the roles of the social workers in the disabilities among Afijio Local Government Civil Servants, Oyo State.

POPULATION OF THE STUDY

Research population can be defined as the complete set of objects, subjects or members that can be observed in a given situation and which have a common observable characteristics. The population for this study was made up of the people with disabilities among Afijio Local Government Civil Servants, Oyo State for the purpose of the research. Fifty (50) members of the people with disabilities were sampled for the study.

SAMPLE AND SAMPLING TECHNIQUES

A sample is a part of a population because of the finance and time constraints restricted my sampling into people with disabilities among Afijio Local Government Civil Servants, Oyo State as a sample was on the basis of convenient rather than on random criterion. The research therefore

believes that the Afijio Local Government Civil Servants considered would provide a picture that will reflect the situation in other Local Government Areas with people with disabilities. Random sampling technique was employed to give equi-probabilty tendency to all people with disabilities so that they all had the opportunity of being selected in the sample.

RESEARCH INSTRUMENT

The questionnaire method was used as the instrument for the collection of data. It consists of two sections A and B. Section A contains personal information about the respondents, which includes age, sex, religion and educational status.

Section B, the intending questions aim at eliciting responses from the respondents was stated there. There were twenty (20) questions, which were related using the attitudinal scale. This scale allows for a degree of yes/No.

VALIDITY OF THE RESEARCH INSTRUMENT

The questionnaire was a 20 item questions constructed by the researcher based on experience, managerial skills acquired and the study of other research works. Most of the questions were easily handled by first hand experienced social workers. Furthermore, the validity of this instrument could not be undermined since the standard has a world-wide acceptability and utility.

RELIABILITY OF THE INSTRUMENT

Reliability refers to the consistency with which a test measures what it is to be measured at different time. It is the degree of accuracy with which an instrument measures what is supposed to measure. The reliability of the instrument was ascertained by analyzing in percentage method. Administering a questionnaire to a group of fifty Afijio Local Government Civil Servants with people with people with disability randomly picked this in the Council. Then the results show that the instrument used was reliable as it elicited the necessary information to achieve the objective of the project.

RESEARCH PROCEDURE

This is the process by which the research was carried out. A well structured 20-scale question will be administered and fifty (50) copies of questionnaire will be designed, containing questions to elicit responses related to the purpose of the study. People with disability (respondents) will administer the copies of the questionnaire. Those who can read and fill the questionnaire do so by themselves while those who need the assistance in one way or the other in reading and filling the questionnaire also do so. After all, the researcher retrieves all the questionnaire forms given out after the respondent had filled them.

PROCEDURE FOR DATA ANALYSIS

The likert scale is used to determine the analysis of the data sample draws by means of using stratified sampling methods to classify the people with disability in the strata or in gender (i.e. male or female). The data that will be collected from the questionnaire will be analyzed descriptively, using chi-square.

Chi-square will be used to bring clarity to enable the readers who are not in the field to understand the study very well, and to determine the analysis of the opinions of the respondents. The responses collected from the residents are analyzed in chi-square using frequency tables. The researcher was first of all presented the information on the data obtained on timetable and discusses the result.

From the table, it is easy to analyze different opinions expresses by each respondent on each question. Hence Agreed and Disagreed are the alternatives use to determine the effects of awareness of the roles of the social workers in the rehabilitation of people with disabilities.

METHOD OF ANALYSIS

RESEARCH QUESTION 1: Is there any effect of social work intervention on the discovery of the talents of the people with disabilities?

Item	Agreed	Disagreed	Total
1	90	25	115
2	80	35	115
3	100	15	115
4	110	05	115
5	90	25	115
Total	470	105	575

Group	Size	α- level	Df	χtab^2	χcal^2	Remark
Agreed	470	0.05	4	9.488	30.2938	Significant.
Disagreed	105					

From the table above, $\chi cal^2 > \chi tab^2$ at 0.05 level of significant we hereby reject the null hypothesis that there is no significant relationship between social workers and the discovery of talents of people with disabilities.

RESEARCH QUESTION 2 : Is there any relationship between social workers' performance and the availability of equipment use for the people with disabilities?

Item	Agreed	Disagreed	Total
1	90	25	115
2	80	35	115
3	100	15	115
Total	270	75	345

Group	Size	α- level	Df	χtab^2	χcal^2	Remark
Agreed	270	0.05	2	5.991	10.222	Significant.
Disagreed	75					

Since $\chi cal^2 > \chi tab^2$, we reject H_0 and retain the alternative hypothesis that there is significant relationship between social workers and the availability of equipment for the use of people with disabilities.

RESEARCH QUESTION 3: Is there any relationship between social workers' skills imparted on the learners (people with disability) and fully gain employment of the people with disabilities after Rehabilitation.

Item	Agreed	Disagreed	Total
1	95	20	115
2	80	35	115
3	110	05	115
Total	285	60	345

Group	Size	α- level	Df	χtab^2	χcal^2	Remark
Agreed	285	0.05	2	5.991	13.921	Significant.
Disagreed	60					

Since $\chi cal^2 > \chi tab^2$, we reject H_0 and retain the alternative hypothesis that there is significant relationship between social workers' skills imparted on the learners and fully gain employment of people with disabilities after rehabilitation.

RESEARCH QUESTION 4: Are there any relationships between social workers' roles and the educational needs of the people with disabilities provided by the parents of people with disability?

Item	Agreed	Disagreed	Total
1	80	35	115
2	100	15	115
3	95	20	115
Total	275	70	345

Group	Size	α- level	Df	χtab^2	χcal^2	Remark
Agreed	275	0.05	2	5.991	11.6493	Significant.
Disagreed	70					

Since 11.6493>5.991 under 0.05 level of significant, we hereby reject the null hypothesis H0 and retain the alternative hypothesis that there is significant relationship between the social workers and the parents that provide educational needs for the people with disabilities.

DISCUSSION OF FINDINGS

H01: The study revealed that there is a significant between social workers and the discovery of the talents of the people during the course of rehabilitation.

This is line with National Association of Social Workers (NASW, 2005) which in support of discovery of talents among the people with disability during the course of training whose role is to assist people with disabilities, their family members, friends and carers to adjust to changes in their health status or capabilities in deal with grief and loss as well as managing the emotional and socioeconomic impact arising as a result of injury or illness.

This result in line with WHO (2011) which in support of rehabilitation process in restoring his/her former state to manageable and controllable state to have independent life.

H02 : The study revealed that there is a significant between social workers' performance and the availability of equipment use by the people with disability.

The LOMAK keyboard as one of the equipment was designed in New Zealand specifically for persons with disabilities (Sobh, 2007), which revealed in line that there is significant relationship between social workers' performance and the availability of equipment to the people with disability.

The World Wide Web consortium revealed in line with the need for International Standards for Web Accessibility as equipment for persons with disabilities to perform like normal counterpart and created the Web Accessibility Initiative (WAI, 2013).

The Business Disability Forum (BDF), formerly the Employers' Forum on Disability, is a membership organisation of UK businesses introduced the membership of BDF in line with the need for a tool with which they could measure the performance of people with disability on disability year

H03 : There is significant relationship between social workers' skills imparted on the learners and fully gain employment of people with disability after rehabilitation.

This is in line with more recent law, the Americans with Disabilities Act of 1990 (ADA), which came into effect in 1992, prohibits private employers, state and local governments, employment agencies and labor unions from discriminating against qualified individuals with disabilities in job application procedures, hiring, firing, advancement, compensation, job training, or in the terms, conditions and privileges of employment.

H04 : There is significant relationship between the social workers' and the parents that provide educational needs for the people with disability.

The study confirmed that the people with disabilities often need a variety of services from parents, relations, and other community agencies, such as financial assistance, wheelchairs, and prosthetic services as well as transportation. Also social workers link people with disabilities with community resources for the provision of educational needs to perform expected job without much dependency.

This is in line with Lesotho, social workers in the Department of Social Welfare are revealed that the collaboration with NGOs like World Vision, Care Lesotho and Lesotho Red Cross Society that provide assistance to people with disabilities result to independent life.

RECOMMENDATIONS

Ended by the finding of this study, the researcher has the following recommendations:

The three tiers of governments that is Federal, State and Local governments should forestall any unforeseen circumstances caused by science, disasters, flood, motor accidents, plane disaster among others so that number of people with disability can be reduced.

There should be adequate modern equipment and room for expansion with required materials and personnel who have special skills and abilities to train the people with disabilities.

The centres/schools should be really funded by the governments and non-governmental organizations within and outside the country.

The centres/schools' curricula should include the teaching of the total communications that will involve manual and oral aspects.

CONCLUSION

The project gives the importance of Social workers in rehabilitating people with disability as the results of analyzed data collected during the study. It was because of this the following conclusions were drawn:

It is very important to establish social worker department in our tertiary institutions in Nigeria in order to improve the life of people with disability.

The study shows that the skills / training given to the people with disability by Social workers develop various skills which can improve independent life of people with disability.

More so, there is need for the government, social workers, policy makers, parents and guidance counselor to work hard in hand to convince the whole world that these peoples can perform better despite their disabilities.

REFERENCES

Arditi & Rosenthal. 1998. "Medicare Vision Rehabilitation Services Act of 2003 HR 1902 IH". Library of Congress.

National Association of Social Workers (2005) U.K. health and Safety Executive.

Bites August 2011 - International organisations report on disability. Disabled Persons Assembly New Zealand. Downloaded from http://www.disabilityreport.com. Retrieved 11/12/ 2014.

Donovan 2012. "Economic Model of Disability". Michigan Disability Rights Coalition. Downloaded from www/com.economic/modeldisability. Retrieved 11/10/ 2014.

Myers, J. E.; Sweeny, T. J.; Witmer, J. M. 2000. "The wheel of wellness counseling for wellness: A holistic model for treatment planning. Journal of Counseling and Development". Journal of Counseling and Development 78: 251–266.

Olkin. 2012. What Psychotherapists Should Know About Disability. Guilford Press..26.

Schwingel, A.; Niti, M. M.; Tang, C.; Ng, T. P. 2009. "Continued work employment and volunteerism and mental well-being of older adults: Singapore longitudinal ageing studies". Age and Ageing 38 (5): 531–7.

Smith, T. B. 2012. A New and Emerging Model of disability. The Customer Model. White paper. The Pennsylvania State University.

Sobh. 2007. Innovations and Advanced Techniques in Computer and Information Sciences and Engineering. Springer. 176.

The National Association of Workers. 2005. from downloaded from

http://www.socialworkers.org. Retrievev on: 8/9/2014.

Tsuinyane, M. 2010: Services offered by the Department of Social Welfare (Personal communication at the Department of Social Welfare Offices). Disability from Wikipedia, the free encyclopedia. Retrieved on: 4/11/2014.

United Nations. 2012. "UN Enable – Promoting the Rights of Persons with Disabilities"

Visual Impairment, Visual Disability and Legal Blindness". SSDisabilityApplication.com. Web Accessibility Initiative (WAI) - home page". W3.org."Web Content Accessibility Guidelines (WCAG) 2.0". W3.org.

Web Accessibility Initiative (2013). Disease incidence, prevalence and disability". Global Burden of Disease.

Witmer, J. M.; Sweeny, T. J. 1992. "A holistic model for wellness and prevention over the lifespan". Journal of Counseling and Development 71: 140–148.

World Health Organization. 2011. Downloaded from World report on disability. Retrieved on: 6/11/2014.

World Health Organization. 2011.Downloaded from Life expectancy at birth. Retrieved on: 3/11/2014.

Zastrow, C. 2000. Introduction to Social Work and Social Welfare. Pacific Grove.

EFFECT OF EPISODIC CONCEPTUALIZATION STRATERGY ON ACHIEVEMENTIN PHYSICS IN RELATION TO INTELLIGENCE

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Abstract

Science results from a process of conceptualization of a subject matter. The task of the science teacher is to help student to understand some of the content knowledge of science. The aim of this study is to find out the impact of episodic conceptualization strategy for the enhancement of achievement of secondary school students. The sample consists of 80 secondary school students of IX standard. The pre-test and post test equivalent group design was followed for this study. The data was analyzed using t test. In this episodic conceptualization based Instructional Strategy could significantly enhances the achievement of IX standard students. Traditional method of teaching could not attribute anything in enhancing the achievement of IX standard students. Intelligence does not influence the achievement of IX standard students. There is no interaction between the treatment and intelligence in influencing the achievement of IX standard students.

Keywords: *Episodic conceptualization strategy, achievement, intelligence, etc.*

INTRODUCTION

Science is the system of knowing the universe though data collected by observation and controlled experimentation. Science looks for different kinds of path and relationship such as relationship between different things relationship between the parts of things relationship between the properties possessed by several things etc. After discovering relationships, the science formulates statement that describes them. Man is able to conquer time and distance with the help of science. Science helped to travel in a space beyond the sky. Science improved his life conditions remarkably. Science gave eyes to blind, hearing for deaf, legs to lame. Science improved the quality and quantity of plants and animals. Thus

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science and scientific invention changed man's whole life by making it costly, comfortable and luxurious. It is changing entire existence of man in important aspects such as health, power, communication and transportation. It helps us to develop scientific attitude in the mind of the learner.

Science results from a process of conceptualization of a subject matter. The task of the science teacher is to help student to understand some of the content knowledge of science. Science learning requires presentation of learning material leading to formation of concepts. So concepts are to be presented by using a definite strategy like episodic conceptualization for increasing the content knowledge of the students.

Shulman defined pedagogical content knowledge as teacher interpretations and transformations of subject matter knowledge in the context of facilitating student learning proposal several key terms of PCK. (1) Knowledge of representation of subject matter, (2) understanding student conceptions of the subject and the learning and teaching implications that were associated with the specific subject matter, (3) general pedagogical knowledge (4) curriculum knowledge, (5) knowledge educational context, (6) Knowledge of purpose of education. To this conception of PCK, others have contributed valuable insights on the importance and relevance of linguistic & cultural characteristic of a diverse student population.

NEED OF THE STUDY

The call for transforming schools from teaching basic skills towards schools for thought (Bruer, 1993) seems to a growing consensus among educators. Researchers and educators worldwide have responded to that call, investing costly resources in projects whose primary goal is to enhance students thinking. However, a serious impediment to wide and successful implementation of many such projects is the lack of adequate methods; episodic conceptualization strategy is a new direction on this area.

If science is poorly taught by teacher or badly learnt by pupil, then it is just like the burdening mind with dead information. It generates new superstitions. Science is a subject where a teacher must select an appropriate strategy for teaching by internalizing the knowledge acquired in different concepts because this is the only subject where the students feel as a remedy to their problems, a leisure that they want to keep forever and many other things. So the teacher must equip himself with a skill of analyzing the concept and with an instructional strategy as well. Concept helps to understand the language of science. Thus concepts have wide applicability in science teaching.

"Pedagogical content knowledge is an accumulation of common element ie, knowledge of subject matter, knowledge of curricula, knowledge of Pedagogy. In PCK is knowing what, when and how to teach using a reservoir of knowledge of good teaching practice and experience". From research, it has become clear that multiple strategies are necessary to promote teacher learning. Several review studies revealed that for strategies aimed at the development of teacher knowledge, such as PCK, to be successful, the following elements are important:

(a) An explicit focus on teachers' knowledge, beliefs and concerns; (b) opportunities for teachers to experiment in their own practice; (c) collegial co-operation or exchange among teachers; and, (d) sufficient time for changes to occur.

The present study suggests one way for analyzing the concepts in physics. The teacher can equip himself with the skill of finding main characteristics, arranging them in a meaningful order. The modules prepared by researcher will help the teacher to establish rapport with the students. The present study will give innovative ideas and thoughts to curriculum setter's and text book writers.

OBJECTIVES

1. To prepare Episodic conceptualization strategy for teaching physics at secondary level
2. To find out the effectiveness of episodic conceptualization strategy in teaching physics st secondary level.
3. To compare the effectiveness of episodic conceptualization strategy in teaching physics with traditional method of teaching physics.
4. To study the effect of Instructional Strategy, Intelligence and their interaction on Pedagogical Content Knowledge by taking Pre-Achievement as covariate.

HYPOTHESIS

1. There is no significant difference between the experimental group and control group in the achievement of physics at pretest level
2. There is no significant difference between the experimental group and control group in the achievement of physics at posttest level.
3. There is no significant difference between the pretest and post test in the achievement in physics for the experimental group.
4. There is no significant difference between the pretest and post test in the achievement in physics for the control group.
5. There is a significant effect of Instructional Strategy, Intelligence and their interaction on Pedagogical Content Knowledge by taking Pre-Achievement as covariate

SAMPLE

The sample of the study consists of 100 students studying under CBSE syllabus at Malappuram. The sample consists of both boys and girls.

TOOLS USED

The tools used for the study are
• Episodic conceptualization strategy
• An achievement test

ANALYSIS AND INTERPRETATION

Hypothesis 1

There is no significant difference between the experimental group and control group in the achievement of physics at pretest level

't' test is applied to test the significance of difference between the mean achievement test scores of the experimental group and control group at pretest level

Table 1

Mean Achievement score on the experimental group compared with that of the control group at pretest level

Groups	N	Mean	S.D	't' value	Level of significance at 0.05 level
Experimental	50	20.23	2.17	0.49	Not significant
Control	50	19.90	1.97		

Table 1 indicate that the 't' value is not significant at 0.05 level. The students of the experimental group do not differ significantly from the students of the control group in the mean achievement test scores at pre test level.

Table 2

Mean Achievement score on the experimental group compared with that of the control group at post test level

Groups	N	Mean	S.D	't' value	Level of significance at 0.01 level
Experimental	50	37.50	3.69	15.06	significant
Control	50	20.00	5.17		

Table 2 reveals that the 't' value is significant at 0.01 level. Hence it could be inferred that there is a significant difference between the two groups as indicated by the mean value, it can be concluded that the students of the experimental group fared better in achievement test than the students of the control group. This again clearly shows that learning with the help of episodic conceptualization strategy will increase the achievement of the students better than learning through the conventional method.

Hypothesis 2

There is no significant difference between the experimental group and control group in the achievement of physics at posttest level.

Hypothesis 3

There is no significant difference between the pretest and post test in the achievement in physics for the experimental group.

Table 3

Mean Achievement test scores of pretest compared with that of the post test for the experimental group

Groups	N	Mean	S.D	't' value	Level of significance at 0.01 level
pretest	50	20.23	32.17	20.72	significant
Post test	50	37.50	3.69		

't' value is applied to test the significance of the difference between the mean achievement test scores of the pretest with that of the posttest for the experimental group.

Table 3 indicate that the 't' value is significant at 0.01 level. Hence it could be inferred that there is a significant difference between the pretest and post test in the

achievement in physics for the experimental group. The higher mean value in the posttest shows that the students fared better in the posttest than in the pretest. This further shows that episodic conceptualization strategy has helped the students to score more in the post test.

Table 4

Mean Achievement test scores of pretest compared with that of the post test for the control group

Groups	N	Mean	S.D	't' value	Level of significance at 0.05 level
pretest	50	19.96	1.97	0.032	Not significant
Post test	50	20.26	5.17		

't' value is applied to test the significance of the difference between the mean achievement test scores of the pretest with that of the posttest for the control group

Table 4 indicates that the 't' value is not significant at 0.05 level. Hence, it could be inferred that there is no significant difference between the pretest and post test in the achievement in physics for the control group.

Hypothesis 4

There is no significant difference between the pretest and post test in the achievement in physics for the control group.

Comparison of adjusted mean scores of pck of experimental group and control group by takng pre- pck as covariate

The objective was to compare adjusted mean scores of PCK of experimental group and control group by considering pre-PCK as covariate. The data were analyzed with the help of One Way ANCOVA by considering pre-PCK as covariate. The results are given in Table 4.4

Table 5

Summary of One Way ANCOVA of PCK by taking pre-PCK as covariate

Source of Variance	df	Sum of Squares (SSy.x)	Mean Square of Variance (MSSy.x)	Fy.x	Remark
Treatment	1	211.042	211.042	11..913	P<0.01
Error	47	832.593	17.715		
Total	49	1766.880			

** Significant at 0.01 level

Table 5 (a)

Summary of Adjusted Mean Scores of PCK by taking Pre PCK as Covariate

Group	Adjusted Mean Scores of PCK	Standard Error
Experimental Group	27.748	0.845
Control Group	23.612	0.845

Note: Pre Test=22.46

From Table 5, it can be seen that the adjusted F-Value (MSSy.x of Treatment/error) is 11.913 (table value is 7.17) which is significant at 0.01 level with df= 1/47. It shows that the adjusted mean scores of achievement of experimental group and control group differ significantly. Thus the hypothesis that "there is a significant difference between adjusted mean scores of achievement of experimental group and control group by considering pre-achievement as covariate" is not rejected. Further from the table 5 (a) the adjusted mean scores of achievement of experimental group is 27.748 which is significantly higher than that of the control group whose adjusted mean score of achievement is 23.612 . It may, therefore, be said that the Episodic Conceptualization based instructional Strategy could significantly enhance the achievement of the students in comparison to traditional method when pre- achievement was considered as covariate.

Effect of treatment, intelligence and their interaction on pck by taking pre-achievement as covariate

The objective was to study the effect of treatment, intelligence and their interaction on achievement by taking pre- achievement as covariate. There were two levels of treatment, namely, Episodic Conceptualization Based Instructional Strategy and traditional method. The two levels of intelligence were above average intelligence and below average intelligence. Thus the data were analyzed with the help of 2X2 factorial design ANCOVA and the results are given in Table 6

Table 6

Summary of 2X2 Factorial Design ANCOVA of PCK by taking Pre PCK as covariate

Source of Variance	df	Sum of Squares (SSy.x)	Mean Square of Variance (MSSy.x)	Fy.x	Remark
Treatment	1	220.183	220.183	12.263	P<0.01
Intelligence	1	8.425	8.425	0.469	
Treatment X Intelligence	1	15.691	15.691	0.874	
Error	45	807.996	17.955		
Total	49	1766.880			

Table 6 (a)

Summary of Adjusted Mean Scores of PCK by taking Pre PCK as Covariate

Group	Adjusted Mean Scores of PCK	Standard Error
Experimental Group	27.77	0.866
Control Group	23.50	0.856
Above Average Intelligence Group	26.05	0.788
Below Average Intelligence Group	25.22	0.927

Note: Pre PCK is 22.46

Effect of Treatment on PCK by taking Pre- achievement as covariate

From the table 6(a), it can be seen that the adjusted F- value is 12.263 (table value is 7.23) which is significant at 0.01 level with df=1/45. It shows that the adjusted mean scores of achievement of Episodic conceptualization based instructional Strategy and traditional method differ significantly. So there was a significant effect of episodic conceptualization based instructional Strategy on achievement. Further the from the table 6 (a), adjusted mean score of achievement of experimental group is 27.77 which is significantly higher than that of control group whose adjusted mean score of achievement is 23.50 . It may, therefore, be said that the episodic conceptualization based instructional strategy could significantly enhance achievement of the students in comparison to traditional method when pre-achievement was considered as covariate.

Effect of Intelligence on PCK by taking Pre-achievement as covariate

From Table 6(a), it can also be seen that the adjusted F-Value for intelligence is 0.469 (table value is 4.06 at 0.05 level) which is not significant at 0.05 level with df=1/45. It means that the adjusted mean scores of achievement of students belonging to above average intelligence and below average intelligence groups do not differ significantly. So there was no significant effect of intelligence on achievement of students when pre-achievement was taken as covariate. Further from the table 6(a) the adjusted mean score of achievement of students belonging to above average intelligence group is 26.05 which is not significantly higher than that of below average intelligence group where adjusted mean score of achievement

is 25.22. It may, therefore, be said that with the increase in intelligence, do not affect the achievement of Prospective teachers when pre-achievement was taken as covariate. Thus Episodic Conceptualization Based Instructional Strategy can be applied to any group of prospective teachers irrespective of their difference in intelligence.

Effect of interaction between Treatment and Intelligence on PCK by taking Pre- achievement as covariate

From the table 6(a), it can be seen that the adjusted F-Value for interaction between treatment and intelligence is 0.874 which is not significant. It means that adjusted mean score of achievement of students belonging to above average and below average intelligence when taught through treatment and traditional Method did not differ significantly when groups were matched in respect of pre-achievement. So there was no significant effect of interaction between treatment and intelligence on achievement of students when pre-achievement was considered as covariate. Thus, the hypothesis that "there is a significant effect of interaction between treatment and intelligence on achievement by considering pre-achievement as covariate" is rejected. It may, therefore, be said that the achievement was found to be independent of interaction between treatment and intelligence when pre-achievement was taken as covariate

Main Effect and Interaction Effect

From the above analysis it seen that only one of the main effect is significant at 0.01level. That is the F- ratio for the effect of treatment, which is the influence of the Episodic Conceptualization Based Instructional Strategy is 12.263 is significant at 0.01 levels and the other main effect intelligence which is not significant at 0.05

level (F-ratio= 0.469). The interaction effect F-ratio=0.874, of treatment and intelligence is not significant. The increase in F-ratio of achievement from 11.913 to 12.263 is due to the interaction of intelligence. This indicates that in the above experiment the main effect like Episodic Conceptualization Based Instructional Strategy contribute positively for enhancing achievement. Whereas the other main effect intelligence and interaction between treatment and intelligence have no significant effect on achievement of prospective teachers. So the developed package can be applied to any group of prospective teachers without considering their difference in the level of intelligence for enhancing their Pedagogical Content Knowledge

CONCLUSION

- There is no significant difference between the experimental group and control group in the achievement of physics at pretest level
- There is significant difference between the experimental group and control group in the achievement of physics at posttest level. The students learning with the help of episodic conceptualization strategy fared better in science than the students learning through the conventional method.
- There is significant difference between the pretest and post test in the achievement in physics for the experimental group. This shows that episodic conceptualization strategy has helped the students to score more marks in the posttest.
- There is no significant difference between the pretest and post test in the achievement in physics for the control group. This shows that conventional teaching method of teaching will not help

the students to score more marks in the post test.

- Intelligence does not influence the achievement of IX standard students.
- There is no interaction between the treatment and intelligence in influencing the achievement of IX standard students

EDUCATIONAL SIGNIFICANCE

- Episodic conceptualization strategy is effective in developing content knowledge and achievement among students.
- Topics are to be presented by using a episodic conceptualization strategy so that knowledge of students can be enhanced.
- Previous knowledge is given more importance while teaching topic in physics.

REFERENCES

Ausubel, D. P. (1968). Educational Psychology A Cognitive View. New York: Holt, Rinehart Wintson.

Best, J.W., &Khan, J.V. (2005). Research in education (9th ed.).New Delhi: Prentice –hall of India.

Bhattacharyya, & Dipak, Kumar. (2006). Research Methodology. New Delhi: Excel Books.

Charles, C.M. (1998).Introduction to Educational Research.NewYork: Longman.

Ebel, R.L. (1972). Essentials of Educational Measurement. Engel Wood Cliffs: N, J. Crencice Hall.

Garret, H .E. (2008). Statistics in Psychology and Education. New   Delhi: Surjeet Publication.

Garret, H.E. (1961). Statistics in Psychology and Education. Bombay: Vakils, Feffer and Simons, Ltd.

Kothari, C.R. (2004).Research Methodology; Methods and Techniques.NewDelhi: Newage International Publications.

A STUDY ON HEALTH TOURISM AND AYURVEDA IN KERALA WITH SPECIAL REFERENCE TO WAYANAD DISTRICT

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Abstract

Tourism industry acts as a powerful agent of both economic and social change. Health tourism in Kerala is more specifically known for the provision of health care with traditional Ayurvedic medicine. This paper is attempted for a vivid and detailed study of health tourism and Ayurveda in the district of Wayanad and its attractions. Through this study find out majority of local tourists (86.6 percent) and foreign tourists (60 percent) had opinion that the treatment packages in the health care centers were excellent. On the other hand, employee's services of the health care centers should be improved. And also find it, majority of local tourists (80 percent) and foreign tourists (86.6 percent) will prefer to visit the same health care centre for the next time also.

Key Words: *Health Tourism, Ayurveda, Wayanad District, etc.*

INTRODUCTION

Tourism has emerged as a key sector of the world economy and has become a major workforce in global trade. Tourism industry acts as a powerful agent of both economic and social change. It stimulates employment and investment, modifies economic structure and makes positive contributions towards balance of payments. Tourism creates direct, indirect and induced employment. It produces a vast spectrum of employment from highly qualified and trained managers of five-star hotels to room boys, sales girls, and artisans. India as a tourist destination exercises immense attraction from various angles. Tourism has emerged as a major industry of the Indian economy, contributing substantially to foreign exchange earnings and serving as a potential generator of employment opportunities.

The concept of health tourism is not a new one. The first recorded instance of health tourism dates back to thousands of years when Greek pilgrims travelled from all over the Mediterranean to the small territory in the Saronic Gulf, called Epidauria.

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The popularity of Ayurveda increases the number of health tourists. Now health tourism is a high-tech healing of the private health care sector as a tourist attraction. Ayurvedic care in hospitality sector got wide publicity thereafter. Health tourism in Kerala is more specifically known for the provision of health care with traditional Ayurvedic medicine. For foreign tourists, it is a travel to a recuperative climate with natural therapeutic resources. The important Indian systems of medicine practiced in Kerala are Ayurveda, Modern medicine, Homoeopathy, Siddha, Naturopathy and Unani. Yoga and other meditation therapies have gained reputation in Western countries as an effective method of curing mental as well as physical ailments. Apart from all these, the traveller who visits the State is also looking for a holistic and wellness-healing, music therapy and herbal therapy which are gaining popularity among tourists. Of these, Ayurveda has the dominant role in attracting health tourists to the State.

SCOPE OF THE STUDY

Kerala pioneered in the field of health tourism through Ayurveda. The government ion taps the State's potential for health tourism through several steps. The State tourism department and the private tourism sector put up a strenuous effort to promote health in a big way which has resulted in a profuse increase of visitors in to the State.

The present study attempts to highlight on the type of services rendered by the Ayurvedic centres, infrastructure facilities, different tourists' packages and its tariff and also the perception of tourists towards these services rendered by Ayurvedic centres. This study would be much beneficial to the potential tourist to know about various services and infrastructure facilities for their treatment. The study is restricted to Wayanad district and so results cannot be generalised throughout the State.

OBJECTIVES

- To study the services rendered by the Ayurvedic Health Care Centres in Wayanad District.
- To study the satisfaction level of the customers in the Ayurvedic Health Care Centres in the District.

METHODOLOGY

The research design adopted for the study is exploratory in nature. For conducting the study, both primary and secondary data were used. The secondary data for the study were collected from journals such as Sajobs, Tourism India, and News Papers and published materials of Tourism Department of Government of Kerala.

- *Sampling*

For collecting primary data, samples of 45 tourists were selected on the basis of convenience from Health Care Centres in Wayanad district during 2015- 2016.

- *Sources of data*

The primary data and secondary data were used for the study. Primary data was collected from the customers in the selected Health Care Centres. Secondary data was collected from journals, newspapers, books, internet, brochures of the sample unit etc.

- *Tools of data collection*

A structured questionnaire was used for collecting data from tourist and unstructured

interview schedule was used for collecting data from officials in the health care centres. Data was collected on various accepts such as the countries represented by the patients, speciality treatment, pricing, marketing techniques, competition factors, tourist destination etc.

- ***Data analysis***

The data collected was analysed through using tables and simple mathematical and statistical like percentages.

Analysis and Interpretations

- ***Opinion of respondents about the Services of Health Care Centre***

In order to promote the health tourism the Health Care Centers and its services have vital role. To appear the flood of visitors Ayurvedic resorts has been mushrooming across the landscape of Kerala. Yet there are problems, the numerous massage centres coming up both inside and outside the State, on the perfect of Ayurveda could tarnish the image of his glorious system. Many of these centres are not supported by good services like professional physicians or qualified therapists, having better dealings of employees, best hospitality, effective treatment packages, good restaurant facilities and accommodation. The uncontrolled commercialization of Ayurveda Centers would spoil the name of Ayurveda. In this point of view, an analysis about services of selected health care centres help to reveal the present reality of the centres. An analysis regarding opinion of respondents about services is shown in table.

As per the table ,it reveals that among the respondents received on treatment

packages, it is interesting to note that (86.6 percent of local tourists and 60 percent of foreign tourists) conveyed that they had excellent opinion on treatment packages. Only 6.7 percent of local tourists felt just satisfactory only.

The response of respondents regarding qualified doctor's services is found that (73.3 percent of local tourists and 66.6 percent of foreign tourists) had excellent opinion. (13.3 percent of local tourists and 20 percent of foreign tourists) were opinion that the doctor's service of the center was good. Very nominal percent of both 13.3 percent of local and foreign tourists thought that the doctor's service was only satisfactory.

From the table found that (80 percent of local tourists and 73.3 percent of foreign tourists) opined that the service of therapists was excellent. (20 percent of local tourists and 6.66 percent of foreign tourists) opined that the service of therapists was good. And remaining (20 percent of foreign tourists) opinion that the service of therapists is satisfactory only.

The table shows (33.3 percent of local tourists and 53.3 percent of foreign tourists) opined that the employee's service was excellent. (13.3 percent of local tourists and 40 percent of foreign tourists) opined that the service of employees was good. Remaining (53.3 percent of local tourists and 6.66 percent of foreign tourists) reveals that the employee's service was only satisfactory.

The response of respondents regarding hospitality it is found that (63.3 percent of local tourists and 80 percent of foreign tourists) had excellent opinion. Majority of the local tourists (23.4 percent as well as only

13.33 percent of foreign tourists) were of the opinion that the hospitality of the centre was good. Very nominal percent of both 13.3 percent of local tourists and 6.66 percent of foreign tourists) thought that the hospitality of the centre was only satisfactory. None of both local and foreign tourists had poor opinion on hospitality.

From the sample table, it is found that (36.6 percent of local tourists and 62.5 percent of foreign tourists) opined that the service of restaurant were excellent. (36.66 percent of local tourists and 37.5 percent of foreign tourists conveyed that the services of restaurant were good. Only 26.6 percent of local tourists had opinion that the services

of restaurant were satisfactory but none of the foreign tourists had the same opinion. Both of the tourists not had the poor opinion about the restaurant services.

Further the table shows that majority of both (73.3 percent of local tourists and 53.3 percent of foreign tourists) was of opinion that the accommodation of health centre was excellent. The table also reveals that (26.6 percent local tourists and 46.7 percent of foreign tourists) was of opinion that the accommodation was good for them. But none of both local and foreign tourists opined that the accommodation was satisfactory and poor.

Table 1

Opinion of respondents about the Services of Health Care Centre

Local tourists	Excellent	Good	Satisfactory	Poor	Total	
Qualified Doctors Services	22 (73.3)	4 (13.3)	4 (13.3)	-	30 (100)	
Qualified Therapist's Services	24 (80)	6 (20)	-	-	30 (100)	
Employees Services	10 (33.3)	4 (13.3)	16 (53.3)	-	30 (100)	
Hospitality	19 (63.3)	7 (23.4)	4 (13.3)	-	30 (100)	
Treatment Packages	26 (86.6)	2 (6.7)	2 (6.7)	-	30 (100)	
Restaurant Services	11 (36.66)	11 (36.6)	8 (26.66)	-	30 (100)	
Accommodation	22 (73.3)	8 (26.6)	-	-	30 (100)	
Foreign tourists	**Excellent**	**Good**	**Satisfactory**	**Poor**	**Total**	
Qualified Doctors Services	10 (66.6)	3 (20)	2 (13.3)	-	1 (100)	5
Qualified Therapist's Services	11 (73.33)	1 (6.66)	3 (20)	-	15 (100)	

Employees Services	8 (53.33)	6 (40)	1 (6.66)	-	15 (100)
Hospitality	12 (80)	2 (13.33)	1 (6.66)	-	15 (100)
Treatment Packages	9 (60)	6 (40)	-	-	15 (100)
Restaurant Services	5 (33.33)	10 (66.66)	- (26.66)	-	15 (100)
Accommodation	8 (53.33)	7 (46.6)	-	-	15 (100)

Source: Primary Data

• ***Opinion of the respondents about the facilities of Health Care Centre.***

Since the Ayurvedic sector is becoming more and more commercial now, the facilities provided by the centre to the tourists are very suitable. Tourism facilities cater to the need of tourists and help tourism facilities to good number of health care centre are increasing every part of Kerala. But how far these centres challenges of this industry and provide facilities to the tourists is a big question. The response received on available facilities in the selected health care centres were listed out in the following table.

For analyzing the opinion of respondents about the facilities of the health care centre, a three point likers scale was used which had the opinion as Highly Satisfied, Satisfied and Dissatisfied. The score which is attached to each of these responses was 3, 2, 1 respectively. Table 4.15 shows the score obtained.

According to table reveals the ranking of different facilities such as Laundry, Library, Transportation, Money Changing, Arrange Local Tour, Internet, Health Care, Indoor Games and Car parking. Among the Local tourists the health care, car parking and local tours are excellent of these health care facilities got highest score (77), car

parking obtained second score (42) and local tour obtained third score (38). The other facilities got only lower ranks.

Among the foreign tourists health care, local tour and laundry facilities were excellent. Of the health care facility got highest score (62), local tour obtained second rank (37) and laundry obtained third rank (20). The other facilities got only lower ranks. The above results showed that foreign tourists were very much satisfied with health care services rendered by the health care centre in Wayanad District.

Table 2
Opinion of the Respondents about the Facilities of Health Care Centre

Facilities	Local Tourists	Foreign Tourists
Laundry	18	20
Library	10	5
Transportation	10	5
Money Changing	5	8
Arrange Local Tour	38	37
Internet	5	15
Health Care	77	62
Indoor Games	6	11
Car Parking	42	-

Source: Primary Data

FINDINGS

- Majority of local tourists (86.6 percent) and foreign tourists (60 percent) had opinion that the treatment packages in the health care centers were excellent. On the other hand, employee's services of the health care centers should be improved.

- As far as various facilities like Laundry, Library, Transportation, Arrange local tour, Internet, Indoor Games, Health care and car parking are concerned, the local tourists and foreign tourists were highly satisfied with health care service and were not fully satisfied with entertainment facilities.

- Majority of local tourists (80 percent) and foreign tourists (86.6 percent) will prefer to visit the same health care centre for the next time also.

CONCLUSION

The competitiveness of India in health tourism is enhanced by the attractiveness of the alternative systems of medicine, Ayurveda in particular, for the foreign tourists. A large number of tourists, both domestic and foreign, undergo treatment under Ayurveda not only for improving their fitness and well- being but also for curing many types of chronic diseases. The unique position that Kerala enjoys with respect to Ayurveda is due to the fact that the treatment in the State has proved effective in dealing with certain diseases, which are incurable by other systems. The State is also well endowed with herbs and medicinal plants, which are used for treatment.

With yoga, meditation, Ayurveda, and natural herbal treatments, India offers a unique basket of services to foreign patients-tourists that are difficult to match by other countries.

BIBLIOGRAPHY

ChandranAnu.,"TOURISM AN OVERVIEW", Kerala Tourism Academy, Thiruvananthapuram - 38, 2007.

Dew Nimi R., Simon Thattil Gabriel, "All-in-one Tourist Destination-Kerala Perspective", The Journal of Business Studies, Vol.2, No.1, December 2004.

Jecob Robinet., "Health Tourism and Ayurveda", Abhijeet Publications, Delhi, 2008.

Kumar Arun., PathaniaKulwant., "Health and Sex Tourism", Regal Publications, New Delhi, 2010.

Pruthi Raj., "MEDICAL TOURISM IN INDIA", Arise Publishers and Distributors, New Delhi, 2006.

Sarngadharm M., Sunanda S.V., "HEALTH TOURISM in INDIA", New Century Publications, New Delhi, 2009.

Sethi Praveen., "NATURE AND SCOPE OF TOURISM", Rajat Publications, New Delhi, 1999.

Sethi Praveen., "Tourism the Next Generation", Anmol Publications Pvt. Ltd, New Delhi, 2010BijuM.R.,"Hospitality Industry in Kerala Performance and Promises", SAJOSPS, Vol.2, No.2, June 2002.

Srinivasan K., "Ayurveda and Information Technology, A Perspective and Curative Approach to Health Care", SAJOSPS, Vol.4, No.2, June 2004.

ACQUIRING VOCATIONAL AND TECHNICAL SKILLS USING ICT WITH MATHEMATICS AS TOOLS

Asifat Shuaib Akintunde*

Abstract

The rapid technological changes in the 21st century pose challenges to education and employment sectors. The new labour market demands have caused many graduates with various certificates to be unemployed. The massive rate of unemployment and the changing face of the economic, social, political, labour market worldwide have led to new education reforms/policies with emphasis on vocational technical education (VTE) geared towards helping the youths and adults to be self-dependent. This research work therefore, examined how information and communication technology with mathematics can be use to acquire vocational skill. The instrument used for the research was a Likert's scale structured questionnaire. The data gathered from the study was analysed using bar-chart and Chi-square statistical analyses.

***Keywords:** VTE, ICT, NRCCTE, Mathematics, Acquisition, Computer Software, etc.*

Introduction

The education reforms/policies of 1970s and 1980s which focused more on the acquisition of certificates instead of the needed vocational skills have caused many Nigerian youths and adults to move into the education industry in pursuit of certificates. As a result of this, the education industries grew rapidly in size in late 1970s and 80s. The growth, according to Teboho (2000) cited by Okolocha (2012), stated that the education system of Nigeria and some other developing counties are still far from being ready for the challenges of preparing students for the contemporary global world.

The rapid technological changes in the 21st century pose challenges to education and employment sectors. The new labour market demands have caused many graduates with various certificates to be unemployed. The massive rate of unemployment and the changing face of the economic, social, political, labour market worldwide have led to new education

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reforms/policies with emphasis on vocational technical education (VTE) geared towards helping the youths and adults to be self-dependent. Cinterfor and Ilo (2006) cited by Okolocha (2012) stated that VTE can be a tool to counteract at least in part, the harmful effect of unemployment by promoting greater job turnover and guarding against the risks of obsolescence.

The use of Information and Communication Technology is so prevalent in contemporary Nigeria that any educational programme or course of study that is related to skill acquisition must embrace it alongside with the knowledge of Mathematics to remain viable. ICT is a recent technology in Nigeria aimed at improving the learning process in skill acquisition. It deals with the use of electronic computers and computer software to convert, store, and protect; process, transmit, and securely retrieve information. ICT devices are applicable to all aspect of human endeavour such as Education, Health, Politics, Library, skill acquisition and many more to mention but a few. It has changed the environment in which students are developed, impacted, acquire skills and learn in schools. ICT married with mathematics presents an entirely new learning environment for students, thus providing advance skills to be successful in skill acquisition and other field of studies. One of the major purposes of ICT is just in the development of human-mental resources to produce new knowledge .The importance of information and communication technology (ICT) with Mathematics in skill acquisition is acknowledged in the policy documents of many countries.

Statement of the Problem

The condition of present day living in Nigeria characterized by unemployment, bad leadership, depressed, economy, poor management of resource, complexity and interdependence, hunger, low income earning and increased in health problems as well as dwellings resource call attention to the need for enhanced levels of life-long skills to achieve personal fulfilment and quality of life.

In this age of massive discontinuities and accelerating changes ,vocational and technical education as an integral body of various discipline that incorporate various area of skills acquisition ways of enhancing skill acquisition. This study therefore intends to examine the place of information and communication Technology married with mathematics in promoting skill acquisition is vocational and Technical Education.

Purpose of the Study

The essence of this study is to examine the extent at which Information and Communication Technology with Mathematics as a course of study in higher institution of learning promote skill acquisition in Vocational and Technical Education in Nigeria.

Significance of the Study

Several related research has been conducted in this area as it affect the skill acquisition by the student in higher institution of learning. The result of this work will therefore be significant in the following ways:

It will help facilitators to adopt the intervention of ICT with knowledge of Mathematics in skill acquisition in VTE

As a result of the above point, the educational achievement of the student in the area of skill acquisition will be improved.

It will also empower the young graduate to stand on their own rather than looking for job that is not ready.

On the part of the Government, having unrest mind on how to coop with the unemployed young graduate will be reduce

Research Questions

The following research questions were raised for the study:

Would the integration of ICT in Vocational and Technical Educational promote or foster skill acquisition?

Would the teaching of Mathematics in Vocational Education promote or foster skill acquisition?

Are there problems with VTE with mathematics when it comes to skill acquisition?

Do Government have positive attitude toward VTE in Nigeria?

Research Hypotheses:

The following hypotheses were tested in this research at a significant level of 0.05:

H_{o1}: The use and knowledge of ICT makes no significant impact in promoting skill acquisition in VTE.

H_{o2}: The knowledge of Mathematics does not enhance and promote skill acquisition in VTE.

H_{03}: There are no significant problems encountered while using Mathematics as a tool to promote skill acquisition in VTE.

H_{04}: Government has no positive attitude towards VTE in Nigeria.

Literature Review

ICT according to Ogunlaja (2013), can be explained to be the application of the branch of knowledge concerned with applied sciences for the practical purpose of processing data or raw facts accurately and timely into a particular sequence of symbols, letters, codes and signals to influence behaviours, decisions, and outcomes of events, and the sending and receiving of this through the use several media or computer related facilities and gadgets in a timely, efficient and effective manner. This could involve the use of media or computer related devices such as computer systems in its totality, networking devices, audio-visual devices and gadgets, and detective & signalling gadgets. It is important to note that some of this devices and gadget may not be purely computer based and as a result may be relations with other field of knowledge.

Mathematics according to Wikipedia.Org is a mental activity which consists carrying out, one after the other, those mental constructions which are inductive and effective: meaning that by combining fundamental ideas, one reaches a definite result. It is also seen as the manipulation of the meaningless symbols of a first-order language according to explicit, syntactical rules to emphasize patterns, orders, or structures. It is perceived that the knowledge of some aspects of Mathematics such as Trigonometry, Angles & Bearing, Construction and many more but to mention a few would play a significant role in promoting skill acquisition in VTE alongside with the knowledge and use of ICT.

VTE as an aspect of Education is revolved around helping learners to acquire skills – both creative and technical. Such skills acquired are exhibited by the perceptuomotor sense of the body. It is a common experience that in learning a new skill one goes through phases in which perceptual and motor aspect of the activity seem to be discordant (Ricardo, Molly and Bohdan; 2013).Ricardo et al (2013) further touted that the transition from discordance between perceptual and motor aspects to their integration is common to all learning; that is, perceptuomotor is a milestone for fluency in any field. This position of theirs does not exclude the area of skill acquisition in VTE.

Available research has found few clear examples of ICT contributing to improved student outcomes, with the most significant results indicating that outcomes were no different from those achieved in traditional settings (Brennan et al, 2001: 36). However, there are many documented examples of positive learning outcomes and benefits that have resulted from the use of ICT that illustrating the potential of online learning and delivery.

Labour market trends indicate that there will be significant growth in work based on advanced skills that include ICT-related competency (DEWR, 2005).Flexible delivery of VTE is regarded as a significant means of accelerating a country's transition to the information economy (Kilpatrick & Bound, 2003: 10 and Education Network Australia VTE Advisory Group, 2000). The importance of lifelong learning for all age groups has been seen as increasingly critical in making this transition effective (Kearns, 2004).

The research carried out by Ramboll Management for the European Commission, DG Education and Culture in 2004,the analysis of telephone interviews, case studies and desk research shows that ICT creates room for flexibility, new learning methods, opportunities for furnishing students with real-life work skills, savings in time and money, the integration of theory and practice and attracting students. Studies also indicate that technology can accelerate, enrich, and deepen basic skills; motivate and engage student learning; helps relate academics to the practices of today's' workforce; strengthens teaching; increase the economic viability of tomorrows' workers; contributes to school change; and connects schools to the real world (Schacter, 1999).

An effective use of ICT in VTE schools can have an immediate positive impact on the schools' learning environments such as, by creating more dynamic interaction between students and teachers, increasing collaboration and team working problem-solving activities, stimulating creativity in both students and teachers, and helping students to control and monitor their own learning. Furthermore, successful use of ICT in schools can help students to acquire and develop skills; both specific to ICT and more generally, that will be useful for them in their future academic and professional lives (OECD, 2005).

The National Research Centre for Career and Technical Education (NRCCTE, 2005) cited by Achieve (2012)in their research tested several models for integrating math in VTE, and several of these approaches have shown a positive impact on student learning of new skills in VTE. The

Math-in-VTE research study tested a model of curriculum integration to improve VTE students' mathematical understanding. In this model, VTE teachers from agriculture, auto-technology, business/marketing, health and information technology programs were each paired with a math teacher from his/her region. During the school year, the VTE-math teacher teams met for a total of 10 days to learn the process of the Math-in-VTE integration. Teachers identified the math content that was embedded in the VTE curriculum through a curriculum mapping process. Then the VTE and math teachers developed math-enhanced lessons that brought out the embedded content and helped clarify how this math matched up with concepts that were taught in the traditional VTE classroom.

Betz (1978) found that mathematics anxiety might be a critical factor in the vocational choice of students, implying that insufficient knowledge of Mathematics may directly or indirectly affect the acquisition of some skills in VTE. Mathematics is a requirement for a wide range of college majors and occupations. Therefore, according to research, the amount of mathematics taken in high school and college determines a student's range of career options (Lent et al., 1993).

Methodology

The research was carried out using a qualitative (post-modern perspective) approach as it seeks to prove the impact ICT married with Mathematics would make in promoting and fostering skill acquisition in VTE. It was quantitative since the research was based on collecting and analysing numerical data; it concentrated on measuring the response to a graduated scale in terms of frequency; and of course, was intended to be detailed and structured, so results can be easily collated and presented statistically. The research followed a descriptive survey design. The method allows the researcher to have a vivid examination on how ICT with Mathematics can be used to promote skill acquisition in VTE in Nigeria. The population of the study comprised of 100 respondents including almost all the fields in the area of VTE, as they would be able to provide accurate information needed by the researcher.

The instrument used was a Likert's scale structured questionnaire designed by the researcher, and was given to professionals in the field of Mathematics, ICT, and VTE respectively for validation of the construct and content. The instrument administration was carried out by the researcher during the working hour and was collected the same day. The data gathered from the study was analysed using bar-chart and Chi-square statistical analyses.

Data Analysis and Presentation of Results

This aspect in research report will depend on what has been stated on the study methodology. Analysis is the breaking down and ordering of data into meaningful groups. The results of this research are presented in relation to the hypothesis tested:

The bar-charts below shows the response of the respondents to aspects of Mathematics and ICT that was considered by them to be of significance if ICT married Mathematics would be used to promote and foster skill acquisition in VTE.

Research Question One: Would the integration of ICT in Vocational and Technical Educational promotes or foster skill acquisition.

Table 1

Levels of Integration of ICT in VTE for promotion of skill acquisition

S/N	A	D	TOTAL
1.	80	20	100
2.	75	25	100
3.	60	40	100
4.	90	10	100
5.	85	15	100
6.	62	38	100
7.	50	50	100
8.	70	30	100
9.	60	40	100
10.	98	02	100
TOTAL	730	270	1000

Table 2

Decision Table

GROUP	NO	α-level	Degree of freedom	χ^2tab	χ^2cal	Decision
AGREED	730	0.05	09	16.919	80.9618	Reject the null hypothesis and accept the alternative hypothesis
DISAGREED	270					

Critical value 0.05

Table I indicate that, the computed X^0tab ratio at the degree of freedom - 09 is 16.919 and less than the X^2cal which is 80.916 which is significant. It means that, the null hypothesis which says that the use and knowledge of ICT makes no significant impact in promoting skill acquisition in VTE.

Research Question Two: Would the teaching of Mathematics in Vocational Education promote or foster skill acquisition.

From the table above, the percentage is calculated and arrived at percentage of correspondents that agreed and agreed on the item as shown on the table.

Hypothesis Testing

H_{o1}: The use and knowledge of ICT makes no significant impact in promoting skill acquisition in VTE.

H_1: The use and knowledge of ICT makes significant impact in promoting skill acquisition in VTE.

Table 3

Teaching of Mathematics in VTE to promote or fosters skill acquisition.

S/N	A	D	TOTAL
1.	70	30	100
2.	81	19	100
3.	75	25	100
4.	80	20	100
5.	60	40	100
6.	72	28	100
TOTAL	438	162	600

From the table above, the percentage was calculated to determine the degree of those that agree on the item and those that disagree, the result of the percentage has showed on the table three above.

Hypothesis Testing

H_{o2}: The knowledge of Mathematics does not enhance and promote skill acquisition in VTE.

H_2: The knowledge of Mathematics enhances and promotes skill acquisition in VTE.

Table 4

Decision Table

GROUP	NO	α-level	Degree of freedom	χ^2tab	χ^2cal	Decision
AGREED	438	0.05				
	05	11.070	15.0178			Reject the null hypothesis and accept the alternative hypothesis
DISAGREED	162					

Discussion

Table 4 above indicate that, the computed X2tab ratio at the degree of freedom - 05 is 11.070 and less than the X2cal which is 15.0178 which is significant. It means that, the null hypothesis which says that the knowledge of Mathematics does not enhance and promote skill acquisition in VTE.

Research Question Three: There are problems with VTE with mathematics when coming to skill acquisition

Table 5

Problems encountered when using Mathematics as a tool to promote skill acquisition in VTE.

S/N	A	D	TOTAL
1.	72	28	1OO
2.	81	19	100
3.	70	30	100
4.	82	18	100
5.	60	40	100
TOTAL	365	135	500

The table above shows the calculated percentage of opinion of the respondents the research question.

Hypothesis Testing

H_{03}: There are no significant problems encountered while using Mathematics as a tool to promote skill acquisition in VTE.

H_3:There are significant problems encountered while using Mathematics as a tool to promote skill acquisition in VTE.

Table 6

Chi-square of respondents Problem encountered in VTE with Mathematics promotes or fosters skill acquisition

GROUP	NO	α-level	Degree of freedom	χ²tab	χ²cal	Decision
AGREED	365	0.05				
	04	9.488	16.4384			Reject the null hypothesis and accept the alternative hypothesis
DISAGREED	135					

Discussion

Table 4 above indicate that, the computed X2tab ratio at degree of freedom – 04 is 9.488 and less than the X2cal which is 16.4384 which is significant. It means that, the null hypothesis which says that there are no significant problems encountered while using Mathematics as a tool to promote skill acquisition in VTE.

Research Question Four: Government have positive attitude toward VTE in Nigeria

Table 7

Government attitude toward VTE in Nigeria

S/N	A	D	TOTAL
1.	50	50	100
2.	52	48	100
3.	45	55	100
TOTAL	147	153	300

The above table shows the percentage of respondents' opinion on Government attitude toward VTE in Nigeria. The Percentage of the respondents attitude was calculated and showed on the table.

Hypothesis Testing

H_{04}:Government has no positive attitude towards VTE in Nigeria.

H_4: There is significant difference between government positive altitude and negligence to VTE in Nigeria.

Table 8

Decision Table

GROUP	NO	α-level	Degree of freedom	χ²tab	χ²cal	Decision
AGREED	147	0.05				
	02	5.991	1.0404			Accept the null hypothesis.
DISAGREED	153					

Discussion

Table 4 above indicate that, the computed X2tab ratio at the degree of freedom - 02 is 5.991 and higher than the X2cal which is 1.040 which is significant. It means that, the null hypothesis which says

that Government has no positive attitude towards VTE in Nigeria was accepted.

Discussion of Findings

Flexible delivery of VTE is regarded as a significant means of accelerating a country's transition to the information economy (Kilpatrick & Bound, 2003: 10; Education Network Australia VTE Advisory Group: 2000). The importance of lifelong learning for all age groups has been seen as increasingly critical in making this transition effective (Kearns: 2004). Findings form this study as shown that flexible delivery of VTE can be achieved if ICT is effectively put to use by facilitators in the field, as ICT has been proven the study to effectively support distance learning, regulating the flow of knowledge and skills impartation in order to conform with learners' pace and interests.

Available research has found few clear examples of ICT contributing to improved student outcomes, with the most significant results indicating that outcomes were nod ifferent from those achieved in traditional settings (Brennan et al, 2001: 36); howbeit, the findings from this study revealed that ICT could offer more significant results when used than when not used. There are many documented examples of positive learning outcomes and benefits that have resulted from the use of ICT that illustrate the potential of online learning and delivery.

The findings of the research carried out by Ramboll Management for the European Commission, DG Education and Culture in 2004, shows that ICT creates room for flexibility, new learning methods, opportunities for furnishing students with real-life work skills, saving time and money,

integrating theory and practice, and posing attraction to students .Studies also indicate that technology can accelerate, enrich, and deepen basic skills; motivate and engage student learning; helps relate academics to the practices of today's' workforce; strengthens teaching; increase the economic viability of tomorrows' workers; contributes to school change; and connects schools to the real world (Schacter, 1999). It is worthy of note that the findings of these study corroborates these previous findings.

The research findings of Ricardo et al (2013), revealed that if provided with suitable Mathematics instruments and practices; learners from an early age can exist with them in rich and nuanced ways that would result in their perceptuomotor integration. This in turn then promotes their overall ability to acquire skills. This finding of theirs indirectly agrees with the findings of the existing research.

The National Research Centre for Career and Technical Education (NRCCTE, 2005) cited by Achieve (2012)in their research tested several models for integrating math in VTE, and several of these approaches have shown a positive impact on student learning of new skills in VTE which further supports the findings of this research regarding the impact Mathematics would make in VTE in the area of skill acquisition. Betz (1978) also found that mathematics anxiety might be a critical factor in the vocational choice of students, implying that insufficient knowledge of Mathematics may directly or indirectly affect the acquisition of some skills in VTE. Mathematics is a requirement for a wide range of college majors and occupations. Therefore,

according to research, the amount of mathematics taken in high school and college determines a student's range of career options (Lent et al., 1993). These additional findings of previous researches prove the findings of the existing research to be true.

Findings as also shown from the foregoing of this research that there are challenges and problems encountered in trying to integrate ICT and the teaching of mathematics in VTE for the enhancement of skill acquisition. Also, is the unconcerned attitude shown by the government towards provision of necessary infrastructures, facilities and gadgets (ICT-based and mathematical) for effective skill acquisition in VTE in Nigeria.

Conclusion

Proponents of ICT have always highlighted the benefits of technology when applied in the different sectors of society especially in education and skill acquisition. There is a belief that using ICT will make people to acquire more skill and make their lives better. Education has benefited immensely from ICT for it "offered an entire new range of possibilities to enhance teaching-learning situation. It is believed that an ICT with mathematics education will prepare the youth to be able to meet the challenges and demands of the economic market once they graduate

Recommendations

From the foregoing of this research, the following are hereby highly recommended:

Institutions, schools and institute delivering courses in VTE are encouraged to integrate ICT and Mathematics both in

terms of their knowledge and related devices to their teaching learning process, in order to enhance learners' ability to acquire relevant skills that would bring about self-reliance and a sustainable economy for the country.

Government at all levels should saddle their efforts to show more concern towards skill acquisition in VTE by making available ICT facilities and gadgets alongside with mathematical tools to respective institutions, schools and institute delivering courses in VTE. This also does not exclude individuals and private bodies concerned.

References

Achieve (2012): Common Core State Standards & Career and Technical Education: Bridging the Divide between College and Career Readiness.

Betz, N. E. (1978). Prevalence, distribution, and correlates of math anxiety in college students. Journal of Counselling Psychology, 25, 441–448.

Brennan, R.; McFadden, M..; and Law, E. (2001): All that Glitters is not Gold: Online Delivery of Education and Training, Review of Research. Australian National Training Authority, National Centre for Vocational Education Research, Adelaide. Australia. Retrieved May 5, 2002 from the World Wide Web: http://www.ncver.edu.au/research/proj/nr9008.pdf

Department of Employment and Workplace Relations (2005):Workforce Tomorrow :Adapting to a more diverse Australian labour market, Australian Government, Canberra.

Education Network Australia VET Advisory Group (2000):Flexible learning for the information economy: a framework for national collaboration in vocational education and training. Strategy 2000, ANTA, Brisbane.

EU Commission ,DG Education & Culture (2005): The use of ICT for learning and teaching in initial Vocational Education and Training.

Kearns, P (2004):Towards a learning revolution in Australia: a consultation paper on future directions for lifelong learning, Adult Learning Australia, Canberra.

Kilpatrick, S & Bound, S (2003):Learning online: benefits and barriers in regional Australia, Volume I, NCVER and ANTA, an initiative of the Australian Flexible Learning Framework for the National VET System 2000-2004.

Lent, R. W., Lopez, F. G., & Bieschke, K. J. (1993):Predicting mathematics-related choice and success behaviours: test of an expanded social cognitive model.Journal of Vocational Behavior, 47, 223-236. Retrieved December 3, 2001,from the World Wide Web: from WilsonSelect database.

OECD (2005):Are Students Ready for a Technology-Rich World? What PISA Studies Tell Us,OECD, Paris.

Ogunlaja - Smith, O. A. (2013): Controlling and Checking Crimes: The Role and Use of ICT Facilities and Gadgets, In the Proceedings of the 4th National Conference of the School of Science, Federal College of Education (Special), Oyo – National Security and Science Education.

Okolocha, C. C.(2012): Vocational Technical Education in Nigeria: Challenges and the Way Forward. Business Management Dynamics, Vol.2 (6), pp.01-08.

Ricardo Neminrosky, Molly L. Kelton and Bohdan Rhodehamen (2013): Playing Mathematical Instruments: Emerging Perceptuomotor Integration with an Interactive Mathematics Exhibit. In Natasha, M. L.et al (Eds.), Journal for Research in mathematics Education, JRME Publication. 44 (2), pp. 372 – 415.

Schacter, J. (1999):The Impact of Technology on Student Achievement: What the Most Current Research has to Say, Milken Exchange on Educational Technology, Milken Family Foundation, New York.

DESIGNING A TEST FOR ASSESSING HIGHER ORDER WRITING SKILLS IN MALAYALAM AT SECONDARY LEVEL

Jessy N. C.*
Dr. B. H. Helen Joy**

Abstract

Testing and evaluation are fields of study in education which have not gained significant attention. Testing language competence is a difficult task. Language testing may be said to be consisting of three main factors, viz., language, learning and evaluation. In the context of language teaching writing is one of the four primary skills viz., Listening, Speaking, Reading and Writing. All the writing activities in secondary level demand that the students are equipped with a good and sound knowledge of language structure, and vocabulary in addition to being aware of different verities of language use (Register), styles. They are also expected to possess fairly reasonable knowledge of phrases and clause structure, significant sayings and proverbs in daily use and those involving moral, social and cultural aspects. But the assessment of higher order writing skills in mother tongue is not being carried out to the expected standard at the secondary level. Here an attempt is made to design a test for assessing higher order writing skills in Malayalam at secondary level with special focus on IXth standard content of present Kerala syllabus.

***Key Words:** Higher order, Writing skill, Assessment, etc.*

Introduction

Acquisition of mother tongue commences from the very infancy of every individual. It begins at home before the entry to formal education and gets developed through school education. While the preschool acquisition happens to be informal, the school education becomes more formal, and at the same time the informal acquisition continues. Formal education in mother tongue involves the development of language skills which facilitates the learners the apt and appropriate use of mother tongue in different situations and contexts. According to National

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Curriculum Framework (NCF, 2005) the objectives of language teaching would include:

i) **Effortless expression:** The learner should be able to employ her communicative skills in a variety of situations. Her repertoire must have a range of styles to choose from. She must be able to engage in discussions in a logical, analytical and creative manner.

ii) **Coherent writing:** Writing is not a mechanical skill; it involves a rich control of grammar, vocabulary, content, and punctuation as well as the ability to organize thoughts coherently often using a variety of cohesive devices such as linkers, lexical repetitions through synonymy etc. A learner should develop the confidence to express her thoughts effortlessly and in an organized manner. The student must be encouraged and trained to choose her own topic, organize her ideas, and write with a sense of audience. This is possible only if her writings are seen as a process and not as a product. She should be able to use writing for a variety of purposes and in a variety of situations, ranging from informal to very formal.

iii) **Control over different registers:** Language is never used in a uniform fashion. It has innumerable varieties, shades, and colors which surface in different domains and in different situations. These variations known as registers should form a student's repertoire besides the register of school subjects. A student must be able to understand and use the variety of language being used in other domains such as music, sports, films, gardening, construction work, cookery, etc.

iv) **Creativity:** In a language classroom, a student should get ample space to develop her imagination and creativity. Classroom ethos and the teacher- student relationship build confidence in the latter to use her creativity in text transaction and activities uninhibitedly.

On the basis of these objectives it is clear that the development of language skills is very important for the attainment of the objectives of language learning. Language skills can be broadly viewed as a) basic or primary and b) advanced or higher order. Basic or primary skills consists of Listening ,Speaking, Reading and Writing (LSRW) and the higher order language skills primarily consist of a) representation/ expression b) argumentation c) refutation/rejection and d) establishing the original point of view (RARE),(Narasimharao, 2002).

Table 1

Difference between Basic skills and Higher Order skills are given in Table 1.

Basic skills	Higher Order skills
• Need basic levels of knowledge, understanding etc.	• Need analytical level of knowledge, understanding etc.
• No need of original thinking	• Need original thinking
• Purpose is very simple	• Purpose is complicated
• Mental process is simple	• More complicated and complex mental process

Development of language skills facilitates the learners in the use of apt and appropriate language in different situations and contexts. These skills combined with the content make the expression more effective. It is assumed that, by the time the learners reach the secondary level of instruction, they would have been equipped with the basic abilities of language use. So the development of higher order language skills has to be focused at secondary level. In this paper the researcher focuses only on the writing skills (basic and advanced) in Malayalam at secondary level with special reference to IXth Standard.

Writing

Writing is an expressive/productive skill while reading is a receptive skill. Writing at Secondary School involves production of small paragraphs, descriptions, and narratives, small controlled dialogues/ conversations, guided composition, comprehension-cum-compositions, free compositions of simple themes/topics etc. Apart from these, it could also be expected from the secondary school students to write simple criticisms, presenting various view points and arriving at feasible and plausible conclusions. All these activities demand that the students are equipped with a good and sound knowledge of language structure and vocabulary in addition to being aware of different varieties of language use (Register) and styles. They are also expected to possess fairly reasonable knowledge of phrases and clause structure, significant sayings and proverbs in daily use and those involving moral, social and cultural aspects. In the context of writing, vocabulary plays a very important role. This demands the students to

be aware of synonyms, antonyms and different shades of meaning (semantic) depending upon the situation and context.

Significance of Writing

The significance of writing in education may be given by highlighting that writing is a productive skill and this skill cannot be developed unless one gets familiarized and systematically develops his / her skills of extensive reading and listening which are basically the primary receptive skills. The basic rules to follow while writing are:

1. The aim of writing should be to make the text as clear as possible
2. Present the ideas clearly and concisely
3. Avoid ambiguity or redundancy
4. Write by following the grammatical rules and spelling
5. Always use appropriate punctuation marks in appropriate places as per the semantics of the context.

According to famous linguist Noam Chomsky, (2000) three significant aspects need to be related to expression (speaking and writing).They are:

1. Grammatical Adequacy
2. Descriptive Adequacy
3. Explanatory Adequacy

Grammatical Adequacy refers to the use of accuracy and aptness of expression.

Descriptive Adequacy refers to providing sufficient and necessary details about the concept concerned to ensure clear and unambiguous explanation.

Explanatory Adequacy refers to the kind of discourse pattern to ensure effective communication/expression of the concept /

theme concerned with due explanatory details.

Once the students are equipped with the above competencies, required of their level, their expression (oral or written) become more meaningful, impressive and effective.

Need for Assessing Higher order writing skills

In the education system of Kerala the curriculum, syllabus and text books of Malayalam are revised on the bases of NCF for achieving the objectives mentioned in Table1.The aim of learning mother tongue at secondary level focuses that the learner should have acquired the competency in higher order writing skills. One can expect a positive and favorable change in the development of writing skill after the implementation of the new curriculum, which has its base on Social Constructivist Theory of Vygotsky. However, critical examination of the teaching learning process of Malayalam language for the last ten years shows that the language competencies of secondary level students are far below the expected levels. Though there are possibilities in the curriculum and the text books for the development of higher order writing and reading skills, the results have not been positive. Some reasons behind the issue were found out through the Critical analyses of the present evaluation system and the assessment process of written tests conducted for students and the assessment of the answer scripts. The existing evaluation system has little scope for proper assessment of the Higher Order writing skills in mother tongue at the secondary level. It is found that the parameters of higher order writing skills

are not considered during the assessment of answer scripts. Taking this into regard, the researcher would be very conscious, particular and specific in the assessment of the answer scripts written by the students with the parameters of each skill considered separately. The assessment would be done on the bases of appropriate and specific parameters of each skill. The researcher had also intended to measure how far the existing method of teaching has been able to make the learner attain the objectives of mother tongue learning at secondary level. Hence, the researcher designed a test for measuring the attainment of the objectives of mother tongue learning (Malayalam) at secondary level with special focus on higher order writing skills. The design and the description of the achievement test in Malayalam for Secondary level on the basis of IX th standard content are given as follows.

Description of the test constructed

The researcher prepared a test for measuring the higher order writing skills on the bases of the content of IXth standard of present Kerala syllabus. The test contains 18 test items and each of the items has specific scores /marks and parameters for assessment. Weightage has been given to the higher order writing skills. All the test items come under four main aspects/areas of objectives of language learning, that is

a)   Aasayaparam, (meaning/theme aspect of the particular discourse)

b)   Bashahaparam (linguistic aspect),

c)   Sahithyaparam (literary aspect) and

d)   Sargatimakam(creative aspect).

Table T1 shows the Design of the test.

Table T1

Design of the Test.

Sl. no	Aspects/areas considered in the test	Test items	Score given for each aspect/area	Type of items
1	Aasayaparam (meaning/theme aspect of the particular discourse)	2,4,7,8,9, (**15,18,14,17)	21	Objective, very short answer, short answer, and essay
2	Bashahaparam (linguistic aspect)	1,3,5,6	6	Objective. very short answer
3	Sahithyaparam (literary aspect)	10,11, (**15,18,14,17)	19	Objective, very short answer, short answer,and essay
4	Sargatimakam. (creative aspect)	12,13,16	14	Essay
		Total No. of items-18	Total score -60	

**Item numbers 14, 17, 15 and 18 are specifically for higher order writing skills. Among this, items 14 and 17 are specifically for Argumentative writing and items 15 and 18 for Critical writing respectively. But they also come under the aspects/areas of both Aasayaparam and Sahithyaparam. So the scores of these items are divided equally and included in Aasayaparam and Sahithyaparam.

Objectives cannot be measured directly. It would be measured through the learning outcomes of the learner during the teaching learning process. Each objective has its own particular expected outcomes for the evidence of the achievement of that particular objective. If a learner achieved a particular objective through the teaching learning process he/she should be able to express or produce the expected outcomes of that particular objective. For the expression/reflection of the expected outcomes at Secondary level in mother tongue learning, the development of higher order writing skills are essential. Therefore higher order writing skills should be considered seriously for the assessment in this test. Table T2 shows the Skill wise details of the test.

Table T2
Skill wise details of the test

Skills to be acquired	Category of skill	Item numbers	Parameters/expected outcomes for assessing particular skill
1) Following language specific norms	Basic or Primary skills of writing	1,2,3,4, 5,6,7,8,9	• Correct usage of grammatical rules and spelling
2) Basic punctuation marks			• Correct usage of basic punctuation marks
3) Paragraph formation			• Clarity and consistency in the presentation of ideas • Keeping coherence and cohesiveness in writing • One and only one idea in one paragraph
1) Select a title for the passage		10, 11	• Should predict the content • Catches the reader's interest • Reflects the tone of the piece of writing • Contains key words • Informative
2) Theme based focused writing	Advanced or Higher order skills of writing		• Accuracy in setting the theme • Important point in the theme • Relevant events strengthen the main goal
3) Argumentative writing		14, 17	• Introduction of the focal point • Statement or opinion of the writer about the theme • Efficiency to substantiate the writer's opinion with supporting evidence • Imperative use of Rhetorics • Technique for linking that writer's opinion with supporting evidence • Conclusion—giving emphasize to the writer's opinion • Cohesiveness and coherence in writing

| 4) Critical writing | Advanced or Higher order skills of writing | 15, 18 | • Attractive/impressive opening statement
• Description of the theme
• Opinion by others regarding the same theme
• Appropriate use of Rhetorics of the language
• Formation of strong and clear opinion of writer in the pre-concluding statement about theme
• Conclusion |
| 5) Creative writing | | 12, 13, 16 | • Expression in a unique and innovative manner (Uniqueness in the Rhetoric usages)
• Techniques to twists
• Social and moral relevance
• Indirect expression revealing very high or strong concepts
• Special style for conclusion |

Preparation of the Items

In order to develop test items for measuring objectives of Malayalam on the basis of writing skills with special reference on higher order writing skills in Malayalam at IXth standard, the researcher made a thorough review of the related literature available and analyzed the existing evaluation methods and assessment process. Apart from this, the researcher had discussions with many experts in this field. Based on these discussions and reviews, the researcher prepared a list of different items to be included in the achievement test. Based on the suggestions put forward by these experts and the objectives of mother tongue learning in IXth standard according to the present Kerala Syllabus, the researcher designed the first draft of the test, which contained pool of items. Items, which overlapped, were critically examined and the items which conveyed the idea very clearly were retained.

Validation of Items by Experts

Items so prepared were given to five experts along with the operational definition to see whether the given items really belong to the particular component of higher order writing skills in Mother tongue learning at secondary level, with special focus on IXth standard. The selected experts were experienced and practicing Secondary School Teachers, State resource persons etc from the field of Language education and Linguistics. They were requested (a) to indicate to which dimension each item belongs (b) to point out ambiguous items, (c) suggest necessary modifications, if any, in the items. The researcher made necessary

corrections and modifications in the items based on the suggestions from these experts and thus developed the final draft of Higher Order Writing Skill Test for IX th standard students.

Conclusion

Writing is one of the two media for human communication viz., Writing and Speaking through which meaning is conveyed. The spectrum of writing is very wide and ranges from the formulation of an alphabet to the development of written discourse and longer texts. The importance and effectiveness of writing is based upon the observation of characteristics like coherence, cogency and precision. Thus, in the development of writing skill in any language teaching/learning situation, large number of aspects are required to be covered starting from the hand movements, formation of the correct shapes of letters, paragraphs, essays and discourses, text books and critical and creative writings. Development of higher order language skills renders the learner's expressions apt and appropriate at secondary level. Then only the objectives of mother tongue learning will be achieved which would be effectively expressed through expected outcomes at the expected level. The present paper gives the details of a test designed for assessing the attainment of the objectives of mother tongue learning, specifically the higher order writing skills in Malayalam of students at secondary level in our schools. Proper evaluation of the answer scripts and appropriate remedial measures based on the evaluation would enable the students at secondary level to attain higher order writing skills in Malayalam.

References

Acharya , K.P. (Edited), (1997) On Writing, Central Institute of Indian Languages. Mysore.

Chomsky, N. (2000) New Horizons in the study of Language and Mind, Cambridge University Press.

Narasimharao, K.V.V.L. (1990) Evaluation in language Education, Central Institute of Indian Languages. Mysore.

National Curriculum Framework 2005, Position paper, National Focus Group on Teaching of Indian languages, NCERT, Government of India

Narasimharao, K.V.V.L. (2002) Mother tongue Education , Central Institute of Indian Languages. Mysore

Sam Mohal Lal.(2015) Format for module lessons (writing),RIE Mysore

AWARENESS AND USE OF E-RESOURCES BY ENGINEERING COLLEGE FACULTY AND STUDENTS

Saritha M.S.*

Abstract

This study reveals the awareness and use of e-resources by college of engineering students and faculty members in Adoor, Kerala .Questionnaire method was mainly used for collecting the data for the study.150 questionnaire were distributed among students and 50 questionnaire distributed among faculty. Total 180 questionnaires replied with responses. The study found that teachers and students were aware about this e-resources and it is very useful to them.

Key words: *E-resources, College of Engineering, Questionnaire method, etc.*

INTRODUCTION

In the present day context the traditional functions of libraries and librarians have undergone radical changes and digital information resources have great importance in libraries and library users. Library is the centre for both printed documents and digital information resources in their collection. In the modern libraries digital information resources are becoming more and more important. The printed resources are now being digitized which has given rise in increase of the availability of books and journals in the electronic format

Digital information resources are those resources which include e-books, e-databases, e-journals, e-magazines, e-audio, e-images, electronic exhibitions, e-newsletters, e-conference proceedings etc. E-books and e-journals are widely used e-resources by the users. E-journals have the facility for full text searching and downloading articles.

College of Engineering - Adoor

College of Engineering Adoor was established during the year 1995and managed by the Institute of Human Resource Development, Kerala, recognized by AICTE New Delhi affiliated to Abdul Kalam Technological university. This college is situated in Manakala, Adoor, Kerala. Four branches of engineering courses are here. They are electrical engineering, mechanical engineering, computer science, electronics and communication engineering and two year M.tech course. Central library has about

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20,000 volumes and 10911 titles, 1000 CD s. IEEE, J-gate, Elsevier, ASTM, ASME e-journals are available in the college. Digital library is also set here with 10 pcs.

Relevance of the study

Technical institutions being the first to initiate the use of latest technologies study to use, and impact of these digital resources at these institutions is the need of the hour and resources will facilitate and encourage other academic institutions to follow. The present study deals with the use of digital information resources by faculty and students of College of Engineering, Adoor. Kerala

OBJECTIVES

1. To assess the use of digital information resources by the users.
2. To know the purpose of e-resources.
3. To find out the frequency of the users.

4. To find out the level of awareness about e-resources.
5. To know the time spent for the library users.
6. To examine the method of searching the users.

METHODOLOGY

For the purpose of the study questionnaire method was used. Questionnaire was prepared separately for teachers and students. Accordingly 50 questionnares were distributed to the teachers and 150 questionnaires were distributed to students. But 40 teachers and 140 students returned questionnaires with responses. However those returned questionnaires are sufficient to provide data for the completion of the work. Also data were collected by the investigator using interview technique. The analysis of the data are given below

DATA ANALYSIS AND INTERPRETATION

Table1

Distribution of Questionnaires and responses

Category	Questionnaire distributed	Questionnaire replied	Percentage
Faculty	50	40	80
Students	150	140	93.33
Total	200	180	90

It gives the response rate of the faculty and students of College of Engineering, Adoor, Kerala. Questionnaires were distributed to 200. 180 users or 90 percentages responded to the survey.

Table 2

Usefulness of e-resources

Usefulness	Faculty	Students	Total
Highly useful	13(32.5)	45 (32.14)	58 (32.22)
useful	23 (57.5)	88 (62.86)	111 (61.67)
Less useful	4 (10)	7 (5)	11 (6.11)
Not useful	0	0	0
Total	40	140	180

This table shows that 57.5 percent of faculty members and 62.86 percent of students were assessing that e-resources are useful for them. Small percent ie, 10 percent of faculty members and 5 percent of students responded that these e-resources are less useful to them.

Table 3

Use of e-resources

E-resources	Faculty	Students	Total
e-journals	22 (55.00)	115 (82.14)	137 (76.11)
e-books	10 (25.00)	21 (15)	31 (17.22)
e-newsletters	6 (15)	2 (1.43)	8 (4.44)
e-magazines	1 (2.5)	2 (1.43)	3 (1.67)
e-theses	1 (2.5)	0	(0.56)
TOTAL	40	140	180

Table 3 shows that most of them are used e-resources like e-journals ie,55 percent of faculty and 82.14 percent of students were used

Table 4

Purpose of e-resources

Options	Faculty	students	Total
Teaching	30 (75)	0	30 (16.67)
For study	5 (12.5)	130 (92.86)	135 (75.00)
Research work	3(7.5)	0	3 (1.67)
Publishing journal article	1 (2.5)	0	1 (0.55)
Leisure	1(2.5)	10 (7.143)	11 (6.11)
Total	40	140	180

Table 4 reveals that faculty members used these e-resources mainly for taking classes(75%) and students (92.86)used for study purpose

Table 5

Frequency of using e-resources

Options	faculty	students	Total
Daily	6 (15)	18 (12.86)	24 (13.33)
Weekly	11(27.5)	24 (17.14)	35 (19.45)
Fortnightly	15 (37.5)	38 (27.14)	53 (29.44)
Monthly	5 (12.5)	49 (35)	54 (30)
Rarely	3 (7.5)	11 (7.86)	14 (7.78)
Total	40	140	180

Table 5 shows that 27.5 percent of faculty members used e-resources weekly and 37.5percent of faculty members were used fortnightly.35percent of students were used monthly.15%of faculty used e-resources daily and daily usage of e-resources of students is 12.86%

Table 6

Level of awareness about e-resources

Opinion	faculty	students	Total
Aware	27 (67.5)	95(67.86)	122 (67.78)
Somewhat aware	13 (32.5)	45 (32.14)	58 (32.22)
Unaware	0	0	0
Total	40	140	180

Table 6 shows that 67.5percent faculty members were aware about this resource and 67.86 percent of students were aware about these resources. Both faculty and students were aware about these resources.

Table 7

Time spent for e-resources

	Less than one hour	One hour	More than 1 hour	Depend on free time	Total
Faculty	18 (45)	8 (20)	3 (7.5)	11 (27.5)	40 (22.22)
Students	6(4.28)	26 (18.57)	88(62.86)	20 (14.28)	140 (77.78)
Total	24	34	91	31	180 (100)

Table 7 reveals that 45 percent of faculty members time spent for e resources less than 1 hour and 27.5 percent faculty are time spent depends on free time. 62.86 percent of students used these e-resources more than 1 hour.

Table 8

Method of searching e-resources

	Search engine	Websites	Through library	Through lab	Total
Faculty	9 (22.5)	11 (27.5)	8 (20)	12 (30)	40 (22.22)
Students	61 (43.57)	24 (17.14)	13 (9.29)	42 (30)	140(77.78)
Total	70	35	21	54	180 (100)

Table 8 shows that most of the students 30 percent were used the e-resources through search engine and lab. Faculty members access to this through lab and websites.

FINDINGS AND CONCLUSION

This study reveals that most of the teachers and students used the e -resources for various purposes. No students are unaware about the e-resources because at the time of membership taken in the library, library staff advice the students about the e-resources facilities especially e-journals. Most of the faculties were explain the use of e-resources to the students especially the computer science faculties. Through lab, majority of students access the e-resources for getting relevant information .It is learned that e-resources is an invaluable asset in education and information gathering which is great benefit to teachers and students.

REFERENCES

Murugan, K.(2015). Utilization of e-resources by faculty and students of Universal college of Engineering and Technology, Vallioor, Tamilnadu: A study. Journal of Advances in library and information science, 4 (1) ,-73-76. www.cea.ac.in

Vijayakumar,K. & Shuaib (2014). Utilization of electronic resources among the faculty members of Engineering colleges in Nagapatinam District..Journal of Advances in library and information science, 3(1), 240-243.

Jose, J.(2014). Usage of electronic resources by the students of Mahatma Gandhi university Kottayam, Kerala. Journal of Advances in library and information science, 3(2), 89-93.

Selvaganapathi, N. & Surianarayanan,S. (2013).Use and impact of electronic resources among the faculty members of St.Xavier's catholic college of Engineering, Chunkankadai. Journal of Advances in library and information science, 2 (2), 50-54.

INFLUENCE OF CERTAIN FAMILY, OCCUPATIONAL, INDIVIDUAL RELATED FACTORS ON JOB SATISFACTION OF TEACHERS

Dr. Smitha J.M.*

Abstract

The capacity of one's job to satisfy needs of an individual positively correlates with the job satisfaction of the employee. The job satisfaction of employees have positive co-relation with the opportunities for need fulfillment of the employees. In the present study an attempt has been made to understand the influence of various factors like gender, age, monthly income, work pressure ,teaching experience and teaching subject, working environment, occupation of spouse, workload and work exhaustion on the variable Job Satisfaction of teachers .The findings revealed that there is no significant influence of these factors on the variable Job satisfaction of teachers.

Key Words: *Job Satisfaction, Individual Factors, Occupational Factors, Workload, Work exhaustion, etc.*

INTRODUCTION

Job satisfaction or employee satisfaction has been defined in many different ways. Job satisfaction is the level of contentment a person feels regarding his or her job. This feeling is mainly based on an individual's perception of satisfaction. Job satisfaction can be influenced by a person's ability to complete required tasks, the level of communication in an organization, and the way management treats employees.

Teachers' job satisfaction is important for school organization and improvement. The teachers having good qualification may or may not have a positive attitude towards the teaching profession. An ideal teacher is expected to have favorable attitude towards his or her profession. The phrase satisfaction of teachers refers to how contended or pleased they feel about their work and the circumstances surrounding their work. Now a days parents and public feel that the teachers don't have satisfaction in the job as a result of which standards of education are deteriorating. The relevance of job satisfaction and motivation are very crucial to the long-term growth of any educational system around the world. In addition, needs satisfaction and motivation to work are very

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essential in the lives of teachers because they form the fundamental reason for working in life.

Many teachers chose teaching as a profession because they valued the intrinsic rewards that they received and because they enjoyed the emotional and personal benefits of the job itself, such as personal growth and a sense of accomplishment. In fact, many teachers selected this profession because they desired helping others and were afforded the opportunity for personal development and public service .Teachers are important in their role in shaping students' intellectual, emotional, and social development. Many teachers entered the field of education and the teaching profession because they had a passion for helping others and enjoyed the personal growth and sense of accomplishment (Latham, 1998).

STATEMENT OF THE PROBLEM

The problem of the present study has been stated as *influence of certain family, occupational, individual related factors on job satisfaction of school teachers in trivandrum.*

STATEMENT OF HYPOTHESES

1. There will not be significant difference in the level of Job Satisfaction among school teachers
   (i) Based on their gender, age and monthly income,
   (ii) Based on work pressure, teaching experience and teaching subject
   (iii) Based on working environment, occupation of spouse, workload and on work exhaustion

1.5   METHODOLOGY IN BRIEF

SAMPLE

Survey method was used for the study. The sample selected for the present study was drawn from teachers of various schools in Trivandrum. A sample of 150 teachers were taken with due importance to gender, experience, gender, age and monthly income, work pressure ,teaching experience and teaching subject, working environment, occupation of spouse, workload and on work exhaustion. For the present study purposive sampling is used.

TOOLS EMPLOYED

To collect data the following tools were used

1. Job Satisfaction Scale((Kavitha &Sam Sananda Raj, 1998)

Job Satisfaction Scale (Kavitha & Sunanda Raj, 1998) includes sixteen items. Both positive and negative items were equally distributed. Out of the sixteen items 8 are positive and 8 are negative. It is a 5 point scale that is each item has five response. The subject are asked to respond to items using five alternatives-A – Strongly Agree ,B – Agree, C – Undecided, D – Disagree and   E – Strongly Disagree.

Reliability

The reliability of the test was found from the sample of 40 employees including males and females. The split half reliability of the job satisfaction scale using odd even method was found out to be 0.93. There is a high positive correlation between the test scores

Validity

Validity was found on the sample as described under reliability. For estimating validity Jon satisfaction scale of Singh, A & Sharma,T.R was given. The correlation between scores on the test and the external criterion was found. Validity coefficient obtained was 0.72. Thus the test has congruent validity.

2. Personal Data Sheet

It was used to collect the personal, family and occupational related details.

STATISTICAL TECHNIQUES USED

Statistical techniques used were

1. The t-test

2. ANOVA

RESULT OF t-TEST

(a) Gender difference in Job Satisfaction among school teachers

Usually the t-test is used for comparing the mean values of the two groups.

Table 1

t-test comparing gender difference of teachers in their job satisfaction

Variables	Gender	N	Mean	Std. Deviation	t	df	Sig (2-tailed)
Job satisfaction	Male	60	57.08	6.89	0.084	148	0.93
	Female	90	56.97	7.91			

For the variable Job satisfaction the mean value obtained for male and female teachers are 57.08 and 56.97 and the t-test value is 0.93. This indicates that there is no significant difference among male and female teachers on the variable Job satisfaction.

(b) Income in the variable Job Satisfaction among school teachers

In order to find out whether there is any significant difference between different income group with regard to variable Job Satisfaction among school teachers t- test was used.Results are shown in Table 2

Table 2

t-test comparing Income in the variable Job satisfaction

Variables	Income	N	Mean	Std. Deviation	t	df	Sig (2-tailed)
Job satisfaction	Below 15000	117	56.69	7.49	-1.00	148	0.31
	15000-25000	33	58.18	7.52			

For the variable Job satisfaction the mean value obtained for income group below 15000 and between 15000-25000 are 56.69 and 58.18 and the t-test value is -1.00. This indicates that there is no significant difference among income group below 15000 and between 15000-25000 on the variable Job satisfaction.

(c)   Work Pressure in the study variables Job Satisfaction among school teachers

In order to find out whether there is any significant difference in work pressure with regard to variable Job Satisfaction among school teachers t- test was used. Results are shown in Table 3.

Table 3

t-test comparing Work Pressure in the variable Job satisfaction

Variables	Work Pressure	N	Mean	Std. Deviation	t	df	Sig (2-tailed)
Job satisfaction	Yes	37	55.91	7.55	-1.02	148	0.30
	No	113	57.38	7.48			

For the variable Job satisfaction the mean value obtained for those reported having work pressure and those reported not having work pressure are 55.91 and 57.38 and the t-test value is -1.02. This indicates that there is no significant difference among those reported having work pressure and those reported not having work pressure on the variable Job satisfaction.

(d) Work environment in the variable Job Satisfaction among school teachers

In order to find out whether there is any significant difference in work environment with regard to variable Job Satisfaction among school teachers t- test was used. Results are shown in Table .4

Table 4

t-test comparing Work Environment in the variable Job satisfaction

Variables	Work Enviroment	N	Mean	Std. Deviation	t	df	Sig (2-tailed)
Job satisfaction	Good	140	57.02	7.44	0.05	148	0.95
	Bad	10	56.90	8.74			

For the variable Job satisfaction the mean value obtained for those reported having good work environment and those reported not having good work environment are 57.02 and 56.90 and the t-test value is 0.052. This indicates that there is no significant difference among those reported having good work environment and those reported not having good work environment on the variable Job satisfaction. .

(e) Occupation of spouse in the variable Job Satisfaction among school teachers

In order to find out whether there is any significant difference in ocuupation of spouse with regard to variable Job Satisfaction among school teachers t- test was used.

Table 5

t-test comparing Occupation of spouse in the variable Job satisfaction

Variables	Occupation of spouse	N	Mean	Std. Deviation	t	df	Sig (2-tailed)
Job satisfaction	Yes	126	56.75	7.40	-0.9	148	0.32
	No	24	58.41	8.03			

For the variable Job satisfaction the mean value obtained for those reported having spouse employed and those reported spouse not employed are 56.75 and 58.41 and the t-test value is -0.99. This indicates that there is no significant difference among those reported having spouses employed and those unemployed on the variable Job satisfaction.

(f) **Work load in the variable Job Satisfaction among school teachers**

In order to find out whether there is any significant difference in workload with regard to variable Job Satisfaction among school teachers t- test was used. Results are shown in Table 6

Table 6

t-test comparing Work Load in the variable Job satisfaction

Variables	Work load	N	Mean	Std. Deviation	t	df	Sig (2-tailed)
Job satisfaction	Yes	24	55.62	7.70	-0.99	148	0.32
	No	126	57.28	7.46			

For the variable Job satisfaction the mean value obtained for those reported having work load and those reported   not having work load are 55.62 and 57.28 and the t-test value is -0.99. This indicates that there is no significant difference among those reported having work load those not having work load on variable Job satisfaction.

(g) **Work exhaustion in the variable Job Satisfaction among school teachers**

In order to find out whether there is any significant difference in work exhausion with regard to variable Job Satisfaction among school teachers t- test was used. Results are shown in Table 7.

Table 7

t-test comparing Work Exhaustion in the variable Job satisfaction

Variables	Work Exhaustion	N	Mean	Std. Deviation	t	df	Sig (2-tailed)
Job satisfaction	Yes	9	59.0	6.74	0.81	148	0.41
	No	141	56.89	7.55			

For the variable Job satisfaction the mean value obtained for those reported having work exhaustion those reported not having work exhaustion are 59.00 and 56.89 and the t-test value is 0.81. This indicates that there is no significant difference among

those reported having work exhaustion and those not having work exhaustion on the variable Job satisfaction.

RESULTS OF ANOVA

Anova is used to find out whether there is any significant difference in job Satisfaction and Depression among school teachers based on their age, experience and teaching subject.

a) In order to find out whether there is any significant difference among school teachers on Job satisfaction based on age ANOVA was done and the result is given below-

Table 8

ANOVA for Job satisfaction among school teachers based on Age

Variables	Group	Sum of Squares	df	Mean Square	F	Sig.
Job Satisfaction	Between Groups	123.08	2	61.54	1.09	0.33
	Within Groups	8265.85	147	56.23		
	Total	8388.94	149			

The results indicate that there is no significant difference among school teachers on Job satisfaction based on their age. The F-ratio obtained for Job satisfaction is 1.09 These values are not significant. This shows that age is not a factor which influence job satisfaction of school teachers.

b) In order to find out whether there is any significant difference among school teachers on Job satisfaction   based on teaching experience ANOVA was done and the result is given in Table .9

Table 9

ANOVA for Job satisfaction among school teachers based on Teaching experience.

Variables	Group	Sum of Squares	df	Mean Square	F	Sig.
Job Satisfaction	Between Groups	197.780	2	98.890	1.775	.173
	Within Groups	8191.160	147	55.722		
	Total	8388.940	149			

The results indicate that there is no significant difference among school teachers on Job satisfaction based on their teaching experience. The F-ratio obtained for Job satisfaction is 1.77 .These values are not significant. This shows that teaching experience is not a factor which influence job satisfaction of school teachers.

In order to find out whether there is any significant difference among school teachers on Job satisfaction based on teaching subject ANOVA was done and the result is given in Table10

Table 10

ANOVA for Job satisfaction and Depression among school teachers based on Teaching Subject.

Variables	Group	Sum of Squares	df	Mean Square	F	Sig.
Job Satisfaction	Between Groups	185.164	2	92.582	1.659	0.194
	Within Groups	8203.776	147	55.808		
	Total	8388.940	149			

The results indicate that there is no significant difference among school teachers on Job satisfaction based on their teaching subject. The F-ratio obtained for Job satisfaction is 1.65 .These values are not significant. This shows that teaching subject is not a factor which influence on job satisfaction of school teachers.

TENABILITY OF HYPOTHESES

(1) The hypothesis is that there will not be significant difference among variable Job Satisfaction of school teachers based on their gender, age , monthly income, work pressure, their teaching experience, teaching subject, working environment, spouse's job status, workload & on exhaustion

The results indicate that there is no significant difference between school teachers on the basis of gender, age, income, work pressure, teaching experience, teaching subject, work environment ,work load and work exhaustion with regard to variable job satisfaction .So the hypothesis is accepted.

MAJOR FINDINGS

School teachers are the social engineers who shape the future of the society. But only a few studies were conducted to understand the job satisfaction level and of teachers. The results indicate that there is no significant difference between school teachers on the basis of gender, age, income, work pressure, teaching experience, teaching subject, work environment, work load & work exhausion with regard to variable job satisfaction . So it throws light on the fact that job satisfaction is not at all influenced by individual, family or occupational related factors.

REFERENCES

Latham, A. (1998, February). Teacher satisfaction. Educational Leadership, 68, 123 - 126.

Nagarathnamma,B.&B, Viswanatha(1991).Effect of Occupational Stress on Job Satisfaction. Journal of Indian Academy of Applied Psychology,17(1&2),81-85.

Ostroff,C.(1992).The relationship between satisfaction,attitudes and performance: An organizational level analysis. Journal of Applied Psychology.77(6),963-967.

Paschali, A., & Tsitsas, G. (2010). Stress and life satisfaction among university students: A pilot study. Annual General Psychiatry, 9(Supplement 1), S96.