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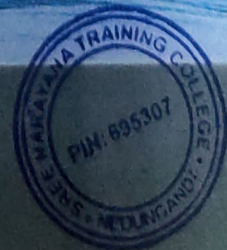
Gurujyothi Research and Reflections

(An Interdisciplinary Peer Reviewed
Biannual Research Journal)

Sree Narayana
Training College
Nedunganda



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Projeqt

Since the interest in technology is rising, the use of multimedia in education is seen as a good way to improve student learning. With the rising demand for powerful and feature-rich presentation software, developers keep presenting more and more advanced tools that actually make users create impressive presentations faster and more easily than ever. Technology uses a variety of presentation techniques to strengthen face-to-face teaching, making teaching more efficient and effective, and providing students with an excellent learning experience. Creating presentations and slideshows is one of the necessary skills for both educators as well as students of the Gen Y. Especially educators must know the importance of presentation tools.

Projeqt is a popular presentation software for creating wonderful presentations. It can be used to mix content from the web with one's own content to create a visual story about the things one loves. It's helpful to create visual stories by linking images, videos, and text together. By inserting real-time tweets or blog feeds, inserting interactive maps, adding audio annotations or streaming videos, it will make our presentations more dynamic. With Projeqt, the presentations will never remain static.

Projeqt allows one to create and share dynamic presentations from scratch or convert old static slides. It is easy to upload PowerPoint files, PDFs, or multiple image files

at once and create a dynamic and portable online Projeqt, with no coding required. Projeqts can be embedded and shared anywhere. This tool also connects with a wide array of social media tools, allowing users to display live twitter feeds, run spotify playlists, reference Flickr images or Google maps, or incorporate a wealth of other live feeds, all updated in real time. Teachers and students can use this site as a web 2.0 teaching and learning tool for creating visually compelling presentations.

Projeqt gives creatives the ability to weave together stories dripping with style and personality from Flickr photos, RSS feeds, tweets, YouTube or Vimeo videos, and any media stored on one's own computer.

Main features of Projeqt

- Presentations are more dynamic
- Create a social and interactive learning experience.
- Link together and connect as many presentations as one likes.
- Projeqt instinctively optimises the presentation.
- Upload document, add pulse and share.
- Create Projeqt once and have it update everywhere, instantaneously.
- No coding or robots required.

Projeqt in Classroom

- Real-time presentations with dynamic slides. With Projeqt, students can access,



Project

share, create and review their work from anywhere, at any time. It is possible to give comments and feedback and track student progress.

- Encourage creativity in the classroom. Project gives teachers and students an online learning tool to express their creativity, knowledge and skills in the classroom. Using the vast bank of resources available to them on the Internet, Project lets students use the information they've found online and compliment it with things they've created themselves.
- Create engaging presentations with the user-friendly dashboard. Using the

simple and intuitive platform, Project gives the tools to easily create dynamic presentations.

By tapping into the best of the web, Project makes it easy for students and educators to be creative. As a multi-dimensional digital storytelling tool it has lots of exciting potential for digital classrooms. Thus it is possible to use this presentation software to revamp the instructional processes at all stages of learning.

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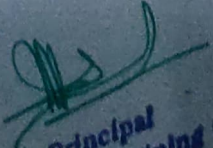
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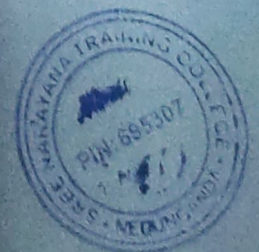
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AWARNESS AND ATTITUDE OF SECONDARY SCHOOL STUDENTS TOWARDS SOCIAL SCIENCE LEARNING WITH REGARD TO EDUTAINMENT

Anju Krishna K. S.
Dr. Sheeba P.

Introduction

Edutainment is an act of learning which is wedded with education entertainment. This is very apt for social science learning. Most of the students dislike social science learning. They have a monotonous approach towards social science learning. There are several strategies to transact the curriculum in effective ways. Incorporating Edutainment in social science learning will support the students to develop positive attitude towards the subject. Edutainment helps to enhance creativity and positive attitude towards the subject. Some of the pupils are lacking interest in their studies because of monotony in teaching learning process. This can be solved through by edutainment to a certain extent.

Abstract

Edutainment means entertaining education. Edutainment is an approach in learning that educates and entertains. Student's interest towards Social Science learning is decreasing day by day. This problem can be solved through developing Joyfulness of Learning by incorporating Edutainment aspect in teaching learning process. In this study, the investigator is trying to analyse awareness and attitude of secondary school students towards edutainment in social science. The method adopted for the study is normative survey method with a sample size of 300 secondary school students. The result shows that the male students have high level of awareness and attitude towards edutainment than their female counterparts.

Key terms: Edutainment, Awareness, Attitude, Social Science

Need and importance of the study

Edutainment or the educational entertainment is helpful for both the learners and teachers as well. This helps the teacher and the students very well. Normally those students who are interested in science subjects dislike social science. So while incorporating edutainment with teaching learning process, it avoids the negative attitude of students towards the subject of


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social science and helps to develop interest towards the subject and study it in a systematic manner. Divya and Sujith (2018), Naseerali (2018), Hansberry and Moroz (2001) made detailed studies on edutainment and arrived at a conclusion that education through entertainment helps the class room activity more lively and interesting. Most of the students are familiar with the usage of technology in learning process. Through this study the investigator tries to analyse the awareness and attitude of secondary school students towards edutainment.

Statement of the problem

The study is intended to analyse "Awareness and Attitude of Secondary School Students towards Social Science Learning with regard to Edutainment".

Definition of key terms

Edutainment

According to Singhal and Rogers (1999), "Edutainment is entertainment education and is the process of purposively designing and implementing a media message both entertain and educate, in order to increase audience members' knowledge about an educational issue, create favourable attitudes and change overt behaviour".

Awareness

"Awareness is an understanding of the activities of others which provides a context for your own activity" (Dourish, 2001).

Attitude

In Psychology, Attitude refers to a set emotions, beliefs and behaviour towards a particular object, person, thing or event.

Secondary level

Those students who are studying in 8th, 9th and 10th respectively are considered as Secondary level students

Objectives of the study

1. To find the awareness on Edutainment in Social Science learning of male and female students at secondary level.
2. To find the attitude of male and female students of secondary level regarding Edutainment in social science learning.

Hypothesis of the study

1. There is no significant difference between male and female students in terms of awareness on Edutainment in social science learning.
2. There is no significant difference between male and female students in terms of attitude towards edutainment in social science learning.

Methodology adopted for the study.

Normative survey method is conducted on a random sample of 300 secondary school students from Thiruvananthapuram Educational district. The tools used were an attitude scale on Edutainment in Social Science and an awareness scale on Edutainment in social science were prepared by the investigator. The investigator distributed the tools among the sample and collected the responses. The responses were tabulated and made ready for the analysis

Tools used for the study:

- t-test for comparison of awareness of Edutainment based on Gender.
- t-test for comparison of attitude towards Edutainment in Social Science based on Gender.

Analysis and interpretation of the data

The scores obtained due to data collection were processed for the following analysis. The analysis was done by taking the hypothesis one by one.

Hypothesis 1

There is no significant difference between male and female students in terms of awareness on Edutainment.

TABLE 1

Data and result of t test for comparison of Awareness of Edutainment based on Gender

Gender	N	Mean	Standard Deviation	t-test	Level of significance
Male	186	82.20	11.62	3.56	S
Female	114	72.81	14.42		

Description

From table 1, it is found that t value is higher than the table value 2.58 at 0.01 level. This shows that there is significant difference between the males and female students in terms of awareness on edutainment.

To test the significance of difference between males and females on their awareness towards Edutainment 186 males and 114 females were taken. The mean and SD of males regarding their awareness on Edutainment was found to be 82.20 and 11.62 respectively. The mean and SD of male and females are found to be 72.81 and 14.42 respectively. Hypothesis 1 states that 'there is no significant difference between male and female students in terms of awareness on Edutainment'. Hence hypothesis 1 is rejected.

Hypothesis 2

There is no significant difference between male and female students in terms of attitude towards edutainment.

Table 2

Data and result of t test for comparison of attitude on Edutainment based on Gender

Gender	N	Mean	Standard Deviation	t-test	Level of significance
Male	186	79.15	12.01	1.09	NS
Female	114	74.17	15.65		

Description

From table 2 it is found that the calculated t value 1.09 is lower than the table value 2.58 at 0.01 level. Therefore, the obtained t value is not significant. This shows that there is no significant difference between the males and females regarding their attitude towards edutainment. To test the significance difference between males and females on their attitude towards edutainment, 186 males and 114 females were taken. The mean and SD of males regarding their attitude is 79.15 and 15.01 respectively. The mean and SD of female students in this regard is 74.17 and 12.65 respectively. Hypothesis 2 stated that 'there is no significant

difference between male and female students in terms of attitude towards edutainment' is accepted.

CONCLUSION

From the study it is seen that the mean of male students towards their awareness on Edutainment is 82.20 and that of female students are 72.81. This shows that the male students are more aware than female students with regard to Edutainment in Social science learning. In the case of attitude also the mean of male students are 79.15 and that of female students are 74.17. It reveals that the male students have a good level of attitude than female students with regard to Edutainment. To conclude it can be said that we can change the attitude of secondary school students by using edutainment as a medium for learning Social Science.

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EFFECTIVENESS OF ICT INTEGRATED LEARNING STRATEGY FOR ENHANCING OCCUPATIONAL AWARENESS ON CULTIVATION OF ORCHIDACEAE FAMILY OF PLANTS

Dr. Dhanya B. Chandran

Introduction

The significance of vocational education is very important in this age. Vocationalisation of Higher Secondary Education aims at rising employment potential of the people through education for self-employment which emphasis agriculture and allied occupations, including miniature, small, cottage and agro-industries or through training for specific competencies in different vocations. Through vocational education learners prepare for jobs that are based on manual or practical activities, traditionally non-academic and completely allied to a specific trade, occupation or vocation. Kerala has an agriculture based economy. Most of the people depend on agriculture for their livelihood. Agricultural products do have a high sensitive price market in Kerala. Agriculture has been a powerful instrument that is vital in the growth and prosperity of every village, city, and country. A great number of economic factors continuously contribute to price fluctuations of agricultural

Abstract

The present study is an attempt to find out the effectiveness of ICT integrated learning strategy for enhancing occupational awareness among higher secondary school students regarding the cultivating Orchidaceae family of plants. ICT integrated learning strategy helps to increase student's retention, develop various skills and promote students self-esteem and high level thinking. In the classroom ICT integrated learning strategy can bridge the gap between theory and practice by giving students the opportunity to practice what they have learned in safe and controlled environment. In schools, technology curricula include multi-media presentations as a required skill for students. The sample of the present study consisted of 55 higher secondary school students. The results of t-test analysis of the pre test and post-test mean occupational awareness score revealed statistically significant difference between occupational awareness level of higher secondary school students. From this it can be inferred that students taught through the ICT integrated learning strategy is better for enhancing occupational awareness on cultivation of Orchidaceae family plants.

Key words: ICT Integrated learning strategy, occupational awareness, plant cultivation, Orchidaceae family.

products, and one of them, undoubtedly, is wages of the people employed in the agricultural industries.

Orchids are most highly prized ornamental plants. The orchid family is probably one of the most important of plant families from a horticultural point of view. It is the second largest family of flowering plants, with about 880 genera and some 26,000 species distributed nearly worldwide. Orchid, (family Orchidaceae), any of approximately 1,000 genera and more than

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25,000 species of attractively flowered plants distributed throughout the world, especially in wet tropics. Orchidaceae is a member of Asparagales, an order of monocotyledonous flowering plants that also includes the asparagus and iris families. The orchid flowers are in great demand and are much more sought after than any other flowers.

The only commercially important product derived from orchids is vanilla. Most vanilla is produced from one species, *Vanilla planifolia*, although two additional species are also cultivated commercially (*V. pompona* and *V. tahitensis*). *Vanilla planifolia* is an economically important orchid that has been cultivated for its flavoring pods. Though it is propagated using stem cuttings, this method is labour-intensive, time consuming and not economically viable. In recent years, the propagation using tissue culture techniques has shown advantages compared with conventional methods.

In this 21st century, the term "technology" is an important matter in many fields including education. This is because technology has become the knowledge transfer highway in most countries. Technology integration nowadays has gone through innovations and transformed our societies that has totally changed the way people think, work and live (Grabe, 2007). ICT can be used in various ways where it helps both teachers and students to learn about their respective subject areas. A technology-based teaching and learning offers various interesting ways which includes educational videos, stimulation, storage of data, the usage of databases, mind-mapping, guided discovery, brainstorming, music, World Wide Web (www) that will make the learning process more fulfilling and meaningful. Integration of Information, Communication, and Technology (ICT) in education refers to the use of computer based communication that incorporates into daily classroom instructional process. In conjunction with preparing learners for the present digital era, teachers are seen as the key players in using ICT in their day-to-day classrooms. This is due to the

capability of ICT in providing dynamic and proactive teaching-learning environment (Arnseth & Hatlevik, 2012). While, the aim of ICT integration is to improve and increase the quality, accessibility and cost-efficiency of the delivery of instruction to students, it also refers to benefits from networking the learning communities to face the challenges of current globalization (Albirini, 2006, p.6). Process of adoption of ICT is not a single step, but it is ongoing and continuous steps that fully support teaching and learning and information resources (Young, 2003).

Integration of technology in education is the need of the hour. In the present scenario technology has the potential to provide solution to many of the challenges in vocational education and hence it increases the flexibility in imparting education so that learners can access knowledge at any time and where ever they may be. Technology enhanced learning will play a very important role in the development of a lifelong learning culture and has the capacity to empower learners by providing them with multiple pathways.

With the advent of computers there is a phenomenal development in all the fields of education, research, inventions, innovations and also living styles of human life and their social status. The world is witnessing many innovations and inventions, which are modernizing the human race in many ways. All these have become a possibility due to the facilitation offered by ICT. Supplementing these developments are the learning methodologies, which emerged with the evolution of computers. Such learning methodologies being e learning, web-based learning, multimedia learning, etc. Internet provision provides every one easy access to the necessitated information without any hassle and difficulty. In the present day context, such emerging learning techniques have become the order of the day and this provision also develops creativity and imagination in the minds of learners. At the same time teachers also facilitate the learners to become more active in their learning process.

Technology based teaching and learning can make several modifications in school that needs for proper scheduling and policy making. The integration of ICT in classroom is getting more significant as it support student in enhancing their collaborative learning skills as well as evolving transversal skills that stimulates social skills, problem solving, selfreliance, responsibility and the capacity for reflection and initiative. The new era of ICT in education should be developed quickly to appropriate extent in order to matching the capability of students as well as teachers in educational experience due to the development of new information technology.

Need and Significance

In the present knowledge based and technology driven era, each individual should be able to choose the right type of vocation beneficial to him. By means of teaching plant cultivation the students should be able to transfer- the scientific and technical knowledge of plant cultivation to earn a living and to modernize it. The conventional method does not encourage the habit of independent thinking. Researchers, Mohanan (2004), Bindu (2007), Reshmi (2009), Mathew (2014) and Lakshmi (2014) reported that ICT enabled and individualized instructional techniques yield better results when compared to ongoing practices in generating and enhancing essential competencies among students of vocational education. For attaining the objectives fruitfully, interests are to be developed among students. For this, innovative strategies are to be used while transacting the content in plant cultivation. In the present era the mode of education has switched from teacher centered learning to student centered learning. Using multimedia learning package in teaching and learning is of greatest importance.

The teaching-learning materials including textbooks, local environment, experiences designed within and outside the four walls of the classrooms play an significant role in learning. Also we need to ensure and enable every child as a self-learner, independent, critical and creative

thinker and problem solver. For this purpose the child requires to collect data, analyse, synthesise, make presentations on those data, share with others. These processes help children in concept formation. Hence, the child needs to go beyond textbooks and use more and more digital and physical resources. In view of the above conditions, Information and Communication Technologies (ICTs) can play a vital role to enhance teaching learning environment. ICT has become, within a very short time, one of the basic building blocks of modern society. Now a days, understanding of ICT and mastering the basic skills has become a part of the core of education, along with reading, writing and numeracy. Pillai & Shaji (2017) conducted a study on the analysis of training needs of vocational trainers in skill development- a case study from VHSE, Kerala. This study revealed that vocational trainers need to improve their teaching skills and core technical skills and to recognise what is important to students so that they can motivate student learning. The study suggested that the usage of ICT especially the multimedia is an important area that trainees needed.

ICT has revolutionised all the spheres including teaching-learning. It has an impact on the way new age teachers look at the content, deliver the content using appropriate methods, integrate suitable resources and adopts strategies for the extension of learning and assessment. Keeping in view the advancement in the digital world, teachers need to equip themselves with necessary professional abilities for using ICT for teaching and learning. ICT integration in teaching learning doesn't simply mean the use of internet and digital devices but to consider using these as a means to attain the objectives and learning outcomes related to the content to be taught and learnt. It can help the students to learn more effectively, interestingly and thereby increase their vocational interest in the content area. It is hoped that the ICT integrated learning strategy being employed in the study helps to develop in students

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a positive attitude towards plant cultivation as an income generating occupation or a part-time business, besides achieving the primary aim of equipping the students for their terminal examination. It is in this context the investigator decides to study the effectiveness of ICT integrated learning strategy for enhancing occupational awareness on cultivation of Orchidaceae family of plants.

Objectives of the Study

The objectives of the study are:

1. To prepare and validate ICT integrated learning strategy for enhancing occupational awareness on cultivation of Orchidaceae family of plants
2. To test the effectiveness of the ICT integrated learning strategy for enhancing occupational awareness on cultivation of Orchidaceae family of plants by comparing the Pre and Post test scores of the treatment group
3. To compare the Post-Test occupational awareness scores on cultivation of Orchidaceae family of plants of the treatment group for sub-samples based on Gender and locality of school

Hypotheses of the Study

The hypotheses formulated are presented below:

1. The ICT integrated learning strategy is effective for enhancing occupational awareness on Orchidaceae family of plants cultivation among higher Secondary School students
2. When the Treatment Group is exposed to treatment there is significant difference between the Pre test and Post test Occupational awareness scores
3. When the experimental Group is exposed to experimental teaching there is significant difference in the Post-Test scores in plant cultivation of sub-samples based on:

(i) Gender

(ii) Locality of Residence

Methodology

The study was intended to develop ICT integrated learning strategy for Higher Secondary School level with a view to enhance occupational awareness on Orchidaceae family of plants cultivation in students. Experimental method was used in the study for determining the effectiveness of ICT integrated learning strategy. The experimental design adopted in the present study was non-equated single group 'Pre-Test Post-Test' design. The study was carried out on a sample of 55 higher secondary school students.

Tools

ICT integrated learning strategy and an Occupational awareness scale on Orchidaceae family of plants cultivation for students studying in Higher Secondary School were used as tools for the study.

Statistical Techniques Used

The researcher used the statistical techniques such as Arithmetic Mean, Standard Deviation, t test and z-test, for analysing the data.

Procedure Adopted for the Study

The investigator developed and validates the ICT integrated learning strategy on Orchidaceae family of plants cultivation. In the next step, 55 students were selected for the study and, the level of performance of the pupils in respect of their occupational awareness on Orchidaceae family of plants cultivation was assessed by means of the pre-test. Then students were and exposed to experimental teaching. The post test was given in order to investigate their improvement in their occupational awareness test scores. The data collected thus were analysed using appropriate statistical techniques to verify the hypotheses.

Analysis and Interpretation

The effectiveness of the ICT integrated learning strategy on Orchidaceae family of plants cultivation for enhancing occupational awareness among higher Secondary School students was

tested by comparing the Pre and Post test scores of experimental group.

Comparison of Pre- Test and Post-Test Scores of Students in The Experimental Group

The Pre-Test and Post-Test scores of students in the experimental group were compared using test of significance of difference between two means (t-test). The details of the comparison of the Pre-Test and Post-Test scores of treatment group are given in the Table 1.

Table 1
Data and results of test of significance of Pre-Test and Post-Test Scores of students in the experimental Group

Groups	Number	Mean	S.D	t- value	Significance
Pre- Test	55	12.27	4.08	15.98	Significant
Post- Test	55	23.78	3.46		

t value is significant at 0.05 and 0.01 level of significance

From the table it is clear that the calculated mean values were 12.27 and 23.78 and the corresponding standard deviations were 4.08 and 3.46 respectively. The 't' value obtained is 15.98 which is greater than the table value at 0.01 level for 54 degrees of freedom. Since the obtained t (15.98) is greater than the table value at 0.01 level of significance, there is significant difference between pre-test and post-test scores of the total sample (C.R=15.98;p<0.01). From

this it can be inferred that ICT integrated learning strategy, was effective for enhancing occupational awareness on Orchidaceae family of plants cultivation among Higher Secondary Schools students.. Hence the hypothesis formed in this context viz. H1 & H2 is accepted.

Comparison of the Post- Test Scores of Students Among Experimental Group Based on Gender

In order to test whether there is any significant difference between the Post-Test scores of Boys and Girls in the Experimental group, the investigator calculated the critical ratio of Post-Test scores. The data and the result of the test of significance are given in the Table 2.

Table 2
Result of Test of Significance of Difference between the Mean Post-Test scores of Boys and Girls in the Experimental Group

Group	No of students	Mean	Standard Deviation	t-value	Result
Boys	24	22.14	2.53	1.46	Not Significant
Girls	31	20.98	3.42		

t value is not significant at 0.05 and 0.01 level of significance

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From the table it is clear that the calculated mean values were 22.14 and 20.98 and the corresponding standard deviation was 2.53 and 3.42 respectively. The 't' value obtained is 1.46 which is not significant at any level of significance. Since the obtained t (1.46) is less than the table values at any level of significance, there is no significant difference in the mean post test occupational awareness scores of boys and girls by means of following ICT integrated learning strategy. (C.R= 1.46,p>0.05).

Comparison of the Post-Test scores of Boys and Girls in the Experimental Group revealed that there is no significant difference between the Post-Test scores of Boys and Girls in the Experimental Group (t=1.46). Hence the hypothesis formed in this context viz. H3(i) is rejected.

Comparison of the Post-Test Scores of Students Among Experimental Group Based on locality of Residence

In order to test whether there is any significant difference between the Post-Test scores of Rural and Urban in the experimental group, the investigator calculated the critical ratio of Post-Test scores. The data and the result of the test of significance are given in the Table 3.

Table 3
Result of Test of Significance of Difference between the Mean Post-Test scores of Rural and Urban in the Experimental Group

Group	No of students	Mean	Standard Deviation	t-value	Result
Rural	33	23.17	2.18	1.31	Not Significant
Urban	22	22.38	2.24		

't' value is not significant at 0.05 and 0.01 level of significance

From the Table, it is clear that 't' value obtained for Post-Test scores of Rural and Urban in the Experimental Group is 1.31 which is less than the table value at 0.05 level of significance. Hence there is no significant difference between the Post-Test scores of Rural and Urban students in the experimental Group.

Comparison of the Post-Test scores of Rural and Urban students in the Experimental Group revealed that there is no significant difference between the Post-Test scores of Rural and Urban students in the Experimental Group (t=1.31). Hence the hypothesis formed in this context viz. H3(ii) is rejected.

Conclusion

From the findings of the study it was explicitly proved the effectiveness of ICT integrated learning strategy for enhancing occupational awareness on Orchidaceae family of plants cultivation. ICT integration enables learning through exploration, discovery and experience. That role belong to the learning needs of students with ICT, the process of learning can become more goal oriented, more participatory, flexible in time and space, un affected by distances and tailored to individual learning styles and increase collaboration between teachers and students. ICT integrated learning enables learning to become fun and friendly, without out fear of inadequacies or failure. It is hoped that the ICT integrated learning strategy on Orchidaceae family of plants cultivation would be helpful to the students to activate their senses, open up new avenues of learning, and get them involved in activities that promote their inquisitiveness and awareness in engaging in worthwhile vocation for earning a living. Moreover, those

who continue or discontinue their studies can be equipped to engage in this occupation as part time or fulltime, so that they can secure some form of profitable employment.

Educational Implications of the Study

- The major contribution of the study is the development of ICT integrated learning strategy on Orchidaceae family of plants cultivation for enhancing the occupational awareness of Higher Secondary School students.
- The ICT integrated learning strategy developed by the investigator was found to be effective for enhancing the occupational awareness on Orchidaceae family of plants cultivation of Higher Secondary School students and it can be utilized to all students who studying Orchidaceae family plants cultivation.
- ICT integrated learning strategy on Orchidaceae family of plants cultivation helps to develop in students a positive attitude towards plant cultivation as an income generating occupation or a part-time business.

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TEACHING COLLABORATIVE ATTRIBUTES THROUGH INNOVATIVE CLASSROOM INSTRUCTION

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1. Introduction

Collaboration refers to the ability to share thoughts and viewpoints explicitly with other persons and to turn up with a collective answer, response or solution for a specific matter or problem. Through collaboration, individuals would be able to merge various ideas, beliefs and theories into a single tangible explanation or solution, which reflects the multiplicity of the group itself. Collaboration is thus a viewpoint of interaction and individual lifestyle where persons are accountable for their activities, including learning and respect the capabilities and contributions of their colleagues. Learning in collaboration is an educational approach to teaching and learning that includes groups of learners working together to resolve a problem, accomplish a task, or generate a product. In the collaborative learning (CL) atmosphere, the learners are challenged both socially and emotionally as they attend to diverse perceptions, and are necessitated to communicate and stand for their ideas. In doing so, the learners start to create their own distinctive conceptual structures and not depend merely on the viewpoints of an expert or subject matter from a text.

2. Need for the Study

The 21st century classrooms are learning spaces with a collaborative environment which promote the development of new ideas and expose students to challenging viewpoints. The students get countless opportunities for creative expression, thereby enhancing their confidence level. The energetic learning environment in and out of the classroom offers a pleasant opening to provide students with opportunities to improve achievement in learning.

In 1996, John Kotter, in his book 'Leading Change', examined what people did to transform their establishments. By following the 8-Step Change Model described by Dr Kotter, organizations can minimise failure and become competent and adapt well to the change. According to Kotter, once the need for an urgent change is recognized, we have to assemble a group with the power and energy to lead and support a collaborative change effort, by putting a cautiously selected group in charge of guiding the change. This may include educational experts, administrators, teachers, students, parents and other staff

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The people have to be assured about the necessity of the change. This often takes strong leadership and visible support from key people within the system. It should be ensured that there is a powerful group guiding the change- one with leadership skills, credibility, communication skill, authority, analytical skills, and a sense of urgency.

The Successive Approximation Model (SAM) developed by Dr. Michael Allen is a method for the development of instructional design products that adopt the implementation need through repetitions of small steps instead of perfectly performed huge steps. Since the SAM does not contain buy-in at each stage, the iterative design procedure emerges fast and energetically. The flexibility of SAM permits for the development of learning and training materials that justify the likely errors at each step that is often corrected with teamwork and collaboration. Employing SAM for learning and training reasons permits the design of materials that take into the consideration their actual world application.

The globally identified and projected 21st century learner skills namely creative thinking, critical thinking, problem solving, communication and collaboration skill, which we strive to incorporate in the new generation learners, underline and propose the characteristics of ingenuity in a different mode. Thus it is imperative to sprinkle the seeds of collaboration in learners through well-designed and well-planned classroom instruction. This paper strives to encourage three main collaborative attributes namely Co-create, Blend and Transmit in learners.

3. Statement of the Problem


This study is entitled 'Sprinkling Collaborative Attributes in 21st Century Learners through Classroom Instruction'.

4. Objectives of the Study

- 1) To identify the learning implications of co-create, blend and transmit in the present-day classrooms.
- 2) To explore the theoretical background of co-create, blend and transmit.
- 3) To frame operational definitions for co-create, blend and transmit in the learning context.
- 4) To design outcome indicators to assess the extent of co-create, blend and transmit in learners.
- 5) To suggest activities to promote co-create, blend and transmit in learners.
- 6) To construct objective type questions from various disciplines for the application of the collaborative traits like co-create, blend and transmit in actual classroom situations.

5. Methodology Adopted

The methodology adopted comprised a Focus Group Discussion, whose chief objective


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was to investigate the influence of applied instructional objectives in science classrooms to gratify the needs of the 21st century learners. Significant ideas arose from the participants who were experts in the educational field with widespread abilities and futuristic attitudes. The investigator fused their viewpoints so as to outline certain advanced implications helpful for transforming the educational ideas into practice.

A key perspective that evolved in the discussion was the crucial need to mould a new generation of completely society-supported learners in the 21st century. This highlighted the need for integrating the concepts in the classroom instruction, which provides scope for collaborative and cross-cultural problem solving, and designing and sharing information for global communities, so as to survive better with others. The investigator also conducted numerous informal interviews with educational experts; secondary school teachers cutting across the subject disciplines, who mould the 21st century learners; and numerous other personnel.

6. Discussion of Findings

6.1. Meaning and Learning Implications of the Collaborative Traits

Through intense review and analysis of the 21st century learners' ability to cope with the emerging changes around them, the investigator identified the meaning and learning implications of the collaborative traits like co-create, blend and transmit in the contemporary classrooms. These are summarised below.

6.1.1. Learning Implications of Co-create

Etymologically, co-create refers to learning together with mutual responsibility to create fresh learning experiences. This implies construction of new understandings and associations of students with their peers and the classroom setting. It encourages students to exhibit an intensified sense of accountability and commitment towards learning, and strengthens the learning experiences. Students can be made to engage better in group works, reflect on instructional materials and resolve problems together.

As far as the teacher is concerned, co-creation equips the teacher to create situations where student interest steers the learning process. It prepares the teacher to be accountable to the students by defining and assigning their roles and responsibilities and by providing them with ample time and chances to accept responsibility at different learning levels. It also facilitates collaborative brainstorming between teacher and the students so as to get a feedback of their anticipated rankings of the different topics and assignments. Once the skeleton of the learning experiences is co-created, the teacher penetrates into the information generated by the class to locate the missing elements and add the significant ones in order to give a comprehensive picture to the material.

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6.1.2. Learning Implications of Blend

Blend refers to the creative mixing of smart thinking with technology and exploring the options beyond the four walls of the classroom. It indicates the exploration of human information integration leading to construction of meaning, which involves a series of open actions for combining dynamic intellectual models in a network of mental spaces. This articulates a set of compositional processes, which operates in a creative construction of meaning through analogy, metaphor, conceptual structures, counter arguments, factual series and even semantic structure of grammatical compositions. Blending facilitates a boosting of the enthusiasm and learning pace of students through the usage of new and varied technological tools in the classroom.

Through blending, the students gain control over the time, place, path and pace of the integrated curriculum, under the guidance of the teacher. It gives students the opportunities to ensure an overall understanding of the concepts before progressing to the next. Each student is provided with exceptional learning experiences through the fusion of face-to-face interaction and digital content. It maintains communication between the teacher and students outside the classroom through consistent sharing of ideas, doubt clarification and well-timed feedback. Teacher and students benefit from the flexibility and suitability of an online interaction, without losing the essence and pleasure of the face-to-face classroom experience.

6.1.3. Learning Implications of Transmit

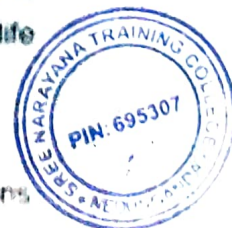
Transmit refers to communicating or conveying information from one person or place to another across mediating space or distance so as to make learning ubiquitous. This enables students to learn anywhere, anytime in a virtual environment using mobile technologies and portable computers, beyond the four walls of the classroom. It promotes the online transfer and exchange of lecture materials and control information from a local smart classroom to another smart classroom in a remote location.

Transmit indicates learning in a flexible and relaxed environment, free from space-based or time-based restraints, which prepares them to be lifelong learners, capable of learning and sharing information throughout their lives. The teacher monitors the students' learning, helps them to examine and evaluate the knowledge resources and alleviates the hindrances. He/she redefines and restructures the classroom environment so as to accommodate the changing learning experiences, inspirations and applicability to the life situations.

6.2. Theoretical Background of the Collaborative Traits

The collaborative traits like co-create, blend and transmit are used in varied dimensions

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in different contexts. The theoretical backgrounds of the collaborative traits like co-create, blend and transmit are explored and briefed below.

6.2.1. Theoretical Background of Co-create

1) Information Technology

- ◆ Networked Value Co-creation represents both provider and customer resources actively participate and where dealings are as significant as the consequences.

2) Psychology

- ◆ Couple Power Therapy Model demonstrates a positive approach to couples treatment in which partners co-create a unified vision for their relationship and achieve a shared identity as a couple.

3) Organisational Studies

- ◆ Customer Co-creation is an open innovation with customers, which is a product (or service) development approach where users and customers are actively involved and take part in the design of a new offering.
- ◆ Value Co-creation is a business paradigm describing how customers and end users might be included as dynamic contributors in the scheme and development of personalized products, services, and experiences.

6.2.2. Theoretical Background of Blend

1) Curriculum and Instruction

- ◆ Blended Learning is a formal education program in which a student learns at least partially through provision of content and training by means of digital and online media with some element of student control over time, place, path, or pace.

2) Behavioural Science

- ◆ Stress Coping Model at work indicates the extent of mixing of everyone's professional or career with home life leading to generation of clear-cut boundaries between the two.
- ◆ Service Learning Model considers the mixing of academic learning and community service to meet real community needs.

3) Neurological Science

- ◆ Conceptual Blending Theory states that elements and vital relations from diverse scenarios are blended in a subconscious process, presumed to be omnipresent to routine belief and language.

- ◆ The Synesthesia Model elaborates a neurological blending of senses. A combination of sound, light, touch, taste and smell happens in surprising patterns.



though which are unknown to public but are common in social life.

4) **Physics**

• Alpha Blending is the process of combining a semi-transparent front colour with a background colour, thereby producing a new blended colour.

5) **Chemistry**

• Polymer Blend or Polymer Mixture is a constituent of a set of substances similar to metal alloys in which at least two polymers are mutually blended so as to produce a new substance with dissimilar physical properties.

• Gas Blending is the process of combining gases for a distinctive objective where the constitution of the resulting mixture is indicated and regulated.

6) **Biology**

• Blending Inheritance Theory states that inheritance of traits from two parents produces offspring with characteristics that are intermediate between those of the parents.

7) **Aerospace Engineering**

• Blended Wing Body (BWB) is a fixed-wing aircraft without a well-defined separating line between the wings and the main body of the craft.

8) **Visual Arts**

• Blend Modes or Mixing Modes in digital image editing are made use of to decide how two layers are blended into each other.

9) **Computer Science**

• Boolean Arithmetic Blend Modes combine the binary expansion of the hexadecimal color at each pixel of two layers using Boolean logic gates.

• Blended Threat is a software threat, which in turn involves a combination of attacks against different vulnerabilities.

10) **Organisational Studies**

• Blended Value refers to an emerging conceptual structure wherein non-profit establishments, companies, and assets are evaluated based on their ability to create a blend of economic, societal, and ecological value.

11) **Linguistics**

• Blend Word is a word formed from parts of two or more other words.

12) **Transportation**

• Travel Blending is a technique, developed in Australia, for encouraging individuals to formulate more effective and environmentally suitable transportation options.


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6.2.3. Theoretical Background of Transmitt

1) Electronics and Telecommunications

- ◆ Transmitter or Radio Transmitter is an electronic device, which produces radio waves, with the aid of an antenna
- ◆ Transmitter Station or transmission facility is an installation made use of to transmit radio frequency signals for wireless communication, broadcasting, microwave link, mobile telephone or other purposes.
- ◆ Television Transmitter is a device, which broadcasts an electromagnetic signal to the television receivers.
- ◆ Transmission Tower or Power Tower is an elevated construction made use of to support an overhead power line.
- ◆ Transmission Line is a specific cable or other constitution intended to carry alternating current of radio frequency.
- ◆ Transmitter Hunting is an action in which participants employ radio track locating techniques to detect one or more radio transmitters concealed within a selected search area.

2) Computer Networking

- ◆ Transmission Control Protocol (TCP) refers to a fundamental protocol of the Internet Protocol suite, which provides reliable, ordered, and error-checked distribution of a set of octets between applications progressing on hosts communicating over an IP network.
- ◆ Maximum Transmission Unit (MTU) refers to the size of the greatest protocol data unit, which the layer can pass onwards, expressed in bytes or octets.

3) Spectroscopy

- ◆ Transmission Electron Microscopy (TEM) denotes a microscopy technique where a beam of electrons is transmitted through an extremely slim sample, interacting with the sample as it traverses it.

4) Acoustics

- ◆ Sound Transmission Class (STC) refers to an integer ranking on the perfection of the dividing wall of a building in reducing airborne sound.

6.3. Operational Definitions for the Collaborative Traits

The operational definitions for the collaborative traits like co-create, blend and transmittframed by the investigator in the learning context is as follows.

Co-create is operationally defined as the process of learning together with mubad



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responsibility by engaging in group works, reflecting on instructional materials and resolving problems together so as to create fresh learning experiences.

- Blend is operationally defined as the process of mixing creatively smart thinking with technology and exploring the options beyond the four walls of the classroom.
- Transmit is operationally defined as the process of communicating or conveying information from one person or place to another across mediating space or distance so as to make learning ubiquitous.

4.4 Outcome Indicators Designed for the Collaborative Traits

The investigator designed outcome indicators for the collaborative traits like co-create, blend and transmit to assess the extent of the learners' ability to work together and get along well with others and the surroundings. The outcome indicators designed are given in Table 1.

Collaborative Traits	Outcome Indicators
Co-create	<ul style="list-style-type: none"> • Exhibits an intensified sense of accountability and commitment towards learning • Reflects on instructional materials • Resolves problems with peers • Does collaborative brainstorming • Shows an in-depth awareness of the learning material
Blend	<ul style="list-style-type: none"> • Explores and integrates information • Fuses face-to-face interaction and digital content • Shows enriched enthusiasms • Acquires an increased learning pace • Gains control over time, place, path and pace of the integrated curriculum • Maintains flexibility of online learning, without losing the bliss of face-to-face experience
Transmit	<ul style="list-style-type: none"> • Gets preparation for lifelong learning • Shares information • Analyses the available knowledge resources • Redefines and restructures the class environment • Accommodates changing learning experiences, inspirations and applicability to the life situations

Table 1: Outcome Indicators of Collaborative Traits

4.5 Teaching-Learning Activities for the Collaborative Traits

To promote the collaborative traits like co-create, blend and transmit in learners, the teaching-learning activities that could be performed in the classroom are listed in Table



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Collaborative Traits	Teaching-Learning Activities
Co-create	<ul style="list-style-type: none"> • Group-based Concept Mapping • Collaborative Poetry Writing • Peer Discussion • Wonder Wall
Blend	<ul style="list-style-type: none"> • Flowchart Construction • Module Preparation • Venn Diagram Construction
Transmit	<ul style="list-style-type: none"> • Blogging • Newspaper Reporting • Letter Writing

Table 2: Teaching-Learning Activities for Collaborative Traits

6.6. Objective Type Questions Constructed for the Collaborative Traits

The objective type questions constructed from various disciplines for the application of the collaborative traits like co-create, blend and transmit in actual classroom situations are shown in Table 3.

CO-CREATE	
SCIENCE	<p>An animated film made by students on the topic 'rolling friction' may include</p> <ol style="list-style-type: none"> • Rubbing both hands together to produce heat • A train moving around a curve • A box pushed along the floor • An iron box pushed across the table
MATHS	<p>While constructing a graph in excel together, the students arrive at which of the following conclusions?</p> <ol style="list-style-type: none"> • A point whose x-coordinate is zero and y coordinate is non-zero will lie on the y-axis • A point whose y-coordinate is zero and x coordinate is non-zero will lie on the x-axis • A point with the same x and y coordinates will lie on the origin • A point with the value x-coordinate greater than y-coordinate will be closer to the y-coordinate
SOCIAL STUDIES	<p>While constructing a collage together on the dressing patterns of women in nineteenth century India, the students understand that women</p> <ol style="list-style-type: none"> • Preferred wearing traditional Indian dress • Switched over to more convenient western clothes • Were accorded a lower status than men in society • Brought about modernity and change in their life styles
ENGLISH	<p>While creating an animation on 'Bruno' in 'The Bond of Love', why was he sent away despite being a loving and playful pet?</p> <ol style="list-style-type: none"> • It started attacking others • It was getting too big to be kept at home • It wished to go to the zoo • It ate some poisons

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BLEND	
SCIENCE	To create a PowerPoint presentation on 'Orion Constellation', the facts gathered online may include a) The brightest star in the Orion Constellation is Alnitak b) Orion Constellation is visible only in the northern hemisphere c) The largest star in the Orion Constellation is Rigel d) The red supergiant star in the Orion Constellation is Betelgeuse
MATHS	In order to prepare an animation on right-angled triangles, what will be the length of the hypotenuse, if the adjacent sides of the triangle are 12 cm and 5 cm? a) 17 cm b) 7 cm c) 25 cm d) 13 cm
SOCIAL STUDIES	While exploring the internet, the survival factors to be considered for calculating the poverty line in India, as identified by students do not include a) Place of residence b) Minimum level of food requirement c) Clothing d) Footwear
ENGLISH	In order to make a powerpoint presentation on Baudhnath shrine, the facts gathered online about the atmosphere in and around the temple includes a) Saffron-clad Westerners trying to enter the temple b) A corpse being cremated on the banks of the river c) Stillness and serenity prevailing in the temple premises d) Monkeys fighting with each other
TRANSMIT	
SCIENCE	The appropriate blog response regarding the reason behind the use of hydrogen gas as rocket fuel rather than CNG would be a) Hydrogen gas is waste-free and clean b) Hydrogen gas is colourless, odourless and tasteless c) Hydrogen gas possesses the lowest density of all gases d) Hydrogen gas is about 14 times lighter than air
MATHS	The appropriate response for social media post on the framing a linear equation for the purchase of a tape recorder for Rs 500 and audio CDs for Rs 70 each will be a) $y = 70x + 500$ b) $x = 70y + 500$ c) $x = 500y + 70$ d) $y = 500x + 70$
SOCIAL STUDIES	The appropriate response obtained through chatting on the promising factors for globalization includes a) Restricted resource and industrial base of major countries b) Declining entrepreneurship c) Shrinking domestic market d) Availability of both quantitative and qualitative human resources
ENGLISH	In a social media post on what an albatross is, the appropriate response would be a) Kangaroo b) Dragon c) Horse d) Sea bird

Table 3: Objective Type Questions Constructed for the Collaborative Traits



7. Conclusion

Today, teachers make use of instructional simulations to involve students in profound learning that stimulates understanding through the learning of scientific methods, and learning to contemplate on and spread knowledge by transmitting it to fresh and thought-provoking problems and situations. This aids in enthusiastically engaging students in problem solving. The students exhibit the capacity to imitate real life circumstances and envisage their consequences. It also strengthens active learning experiences in students and inspires them to share meaningful knowledge and experiences in constructing new ideas and understanding. Thus the present educational system should help students to build up the collaborative traits and adjustment they need to be successful in life. This provides them a way to discover positive, self-regulatory coping skills to get along well with others.

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May 7, 2021

Dear Dr. Viji V,

Thank you for attending the 2021 Virtual Annual Meeting of the American Educational Research Association (AERA) held on April 8-12, 2021. The success of this year's Annual Meeting can be attributed to the contribution of you and more than 14,000 attendees who participated in more than 2,000 sessions.

Please accept this letter as AERA's official confirmation that you were invited to present "Taxonomy of Ingenuity and Connectedness: A Post-Bloom-Era Wave in Education" and you attended the virtual Annual Meeting and paid all the necessary fees.

I look forward to your continued participation in future AERA Annual Meetings.

Cordially,

A handwritten signature in black ink, appearing to read 'Felice J. Levine', written in a cursive style.

Felice J. Levine, Ph.D.
Executive Director

A handwritten signature in blue ink, appearing to read 'Sree Narayana', written in a cursive style.
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(An Interdisciplinary Peer Reviewed
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EXPLORING THE IMPACT OF UNIVERSAL CONNECTEDNESS IN THE CLASSROOM ECOSYSTEM

Dr. Viji V.

Introduction

Whatever may be the age level, an individual's personality develops through effective inculcation of 21st century skills, and all these skills are inseparable and develop in cohesion with each other. Students of the digital age are social by nature. They text, post, update, share, chat and constantly co-create in technological environments with each other. When they are unable to do this in school, they become disengaged and unattached to their learning. Establishing connectedness and collaboration with others are essential not only to their learning but their mental and emotional health. The ability to connect is essential for the 21st century learners. Connectedness is essential when it comes to living in a cooperative society. Globalization and new communication technology have changed the way we think about connectedness in the classroom and outside of it.

Abstract

Nassim Haremein's documentary 'The Connected Universe' developed by the Resonance Project Foundation, Canada, depicts an interconnected relationship of theoretical physics, cosmology, quantum mechanics, biological sciences, chemistry, ancient civilizations, cultural traditions, and anthropological routes across the globe, which evolves into a comprehensive interpretation of the fundamental organization of the universe. This paper is an upshot of the integration of Nassim Haremein's concept of Universal Connectedness being applied to the educational scenario. The impact of Connectedness in the classroom ecosystem and 21st century learners is explored and viewed from multiple dimensions. **Keywords:** Universal Connectedness, Classroom Ecosystem, 21st century learners.

Statement of the Problem

'Exploring the Impact of Universal Connectedness in the Classroom Ecosystem'.

Objectives of the Study

1. To explore the prospects of universal connectedness in the 21st century.
2. To identify the role of connectedness in the current educational system.

Methodology Adopted

By means of intense grounded theory approach and construct making, the investigator identified the relevance of infusing connectedness in the 21st century learners, and the factors that affect the requirement of connectedness. Correspondingly, the investigator suggested measures to

develop connectedness among the 21st century learners, which is indispensable to shape the contemporary learners into productive citizens of the 21st century.

Discussion of Findings

Concept of Universal Connectedness

A Swiss Physicist, Nassim Haramein, created the Unified Field Theory, in cooperation with the physicist Elizabeth Rauscher, which he called the Haramein-Rauscher Metric. Haramein's research into a range of disciplines including theoretical physics, cosmology, quantum mechanics, biology, chemistry and ancient civilizations has brought about a comprehensible interpretation of the fundamental organization of the Universe. This causes a thorough change in our recent awareness of physics and perception, and generates a motivating unified theory of space-time, which may demonstrate to be one of the most significant philosophical, scientific and technological innovations of the present times.

Nassim Haramein, in his documentary film 'The Connected Universe' explains his view of the universe and explores how different aspects of the universe are connected. Haramein ascertains that everything in the universe is connected from a cosmological level to a quantum level to form a unified theory of everything. It points out that everything in the universe, from the largest to the smallest extent, is connected out of a unified understanding of gravity. The acquisition of the interconnection between various aspects of the universe is attributed to existence and human experience. It indicates that besides the scientific dimension, there is a more emotional and human side, which brings different aspects together. This motivates and inspires us to look at the universe from a different perspective. Geometry bears the key to constructing a unified equation of the universe, and an intense connection between various aspects of the universe is deeply felt.

The concept of 'Connectedness' behaves as a universal integrator. A wide meaning of spiritual, philosophical, scientific learning ecosystem with varying theoretical and practical integration is expected out of the philosophy of connectedness. The universal connectedness philosophy by Nassim Haramein and Joseph Campbell propose a futuristic version of an evolving mega framework of universal thought beyond knowledge, which involves an ever expanding and progressive cosmic growth where social connectedness and spiritual connectedness assume significant parts to play. Joseph Campbell's universal connectedness theory also underlines this collective interdependence where a spiritual cohesiveness functions as a binding force, augmented by the binding energy, released out of the social connectedness.

Connectedness in Education

When we apply the theory of connectedness to the educational platform, we can see a firm connectedness between the learners' special interests, peer associations and success in intellectual, social or profession-based areas. Students learn best when energetically engaged, designing and solving problems they are concerned about, and encouraged by peers who value and appreciate their achievements. Connectedness pertains to the best of the learning disciplines to innovative technologies in a networked world. New networked and digital technologies enhance the development of connectedness among learners. Instead of spotting technology as a measure towards more effective and mechanical form of education, connectedness positions advanced, practical and student-centred methods as the key elements of technology-enhanced learning.

According to Marc Prensky, in order to make the teaching-learning process smooth and effective, the digital immigrants have to adapt to the changing scenario, so that they

get tuned with the digital natives. A connectedness ought to be established between the digital natives and digital immigrants, whereby mutual exchange of ideas is possible. This evokes a thorough transformation of the entire educational practices.

The present day teachers need to get away from traditional teaching approaches that are detached from the learning styles of today's students, so as to meet the distinctive learning requirements of the digital natives. They have to incorporate the world outside the classroom, which is familiar for the students, into the classroom instruction. The teachers have to empathize with the students and strive hard to integrate the ways in which the students employ digital tools to engage with their surroundings. The teachers can make use of strategies that enable them to reach the students. For this, they need to step outside their comfort zones, meet the students where they are, show willingness to work with them, and value their individuality and knowledge. Thus the digital immigrants can maintain themselves up-to-date and inspire lifelong learning.

Thus, the existing gap between the digital natives and digital immigrants has to be abridged to allow smooth exchange of ideas. The cultural/ value patterns inherited from the digital immigrants could be integrated with the technological base of the digital natives, in a definite knowledge platform, to yield an innovative educational structure. This can be achieved by means of designing a new methodology of instruction, which guarantees the attainment of up-to-date information, value patterns as well as a firm technological base, so as to bridge the generation gap.

In place of the previous notion of the classroom compelling students to think and learn in one position all day, the teachers have to restructure the classrooms with the purpose of making the learning space more flexible. The resources in the classroom need to be

developed and prearranged for the user-friendliness and suitability of all learners. The teachers need to guarantee that they are not just assisting one category of learner, but a comprehensive classes of learners with distinct multiple intelligences. This necessitates the creation of an adaptable learning environment that can convene the requirements of all learners. Such a reshaping of the classrooms to harmonise the necessities of every discrete learner will motivate learners to perform well in a pressure-free manner.

Connectedness in learning is characterized by plenty of information and public connection created by interactive and digital media. This influences extended access to opportunities and meaningful learning experiences. The element of connectedness in education is evident from the learning environments, which are mostly found to have a sense of shared intention and flexibly networked infrastructures.

Also, we find that for bringing about the overall development of the learners, it is necessary to establish a connectedness among the diverse aspects related to them. An interconnection between the internal and external environments of the learners should be maintained. This throws light into the creation of an instructional design, which gives equal weightage to the emotional and humane dimensions of the learners, together with other attributes. Thus for moulding the 21st century learners who possess ingenuity in all respects, an integrated framework is necessary, which ascertains a firm connection between the intellectual, value-based as well as technological spheres of human development.

A corollary of the same thought could be extrapolated or elicited out of the learning ecosystem anticipated by the Taxonomy of Ingenuity and Connectedness. A holistic network of physical, technological, digital and virtual infrastructures of the 21st century



classroom environments and the manifold rules, theories, principles, processes and philosophical paradigms that help to mould, govern and control the learning ecosystem of the 21st century classrooms come under the purview of 'connected universe' of the new taxonomy designed. All the contemporary learning theories also need to be subjected to a purposeful intertwining to establish a comprehensive picture of the 'universal connectedness' to be realized in the classroom environment (ecosystem).

From the earlier periods itself, the need for a strong constructive connectedness established through student-teacher interactions, student-student interactions and student learning and development; were underscored. The idea of connectedness highlights the extent of support and comfort felt by students in the classroom, and their overall feeling regarding the learning atmosphere within the classroom. The learners perceive the need for connectedness as to make learning a pleasurable experience, and help them appreciate and internalize the learned things in a better way. The increased involvement of students in class activities and their meaningful collaboration with the peers generate an open, lively and engaging atmosphere. By incorporating group activities, demonstrations, discussions, and short video presentations in classroom instruction, the teachers can instil in the students, a feeling of interdependence and social connectivity.

A solid connectedness is observed between the unique interests of students, their relationships with their companions, and their achievement in academic, social or work-based zones. The best output from students is obtained when they are actively involved in devising the solutions to the problems encountered. Besides this, they feel excited when they are cheered by peers. Connectedness attains its best with the integration of learning disciplines and

innovative digital tools and technologies in the classroom. Thus, the designing of effective classroom experiences, and incorporating the latest technological practices, which foster universal connectedness and interdependence, assist to bring out the trademark of the society to be shaped and dreamed to be, in the years to come.

Importance of Connectedness in the Classroom

Connectedness is capable of improving the academic performance of students. The reasons that emphasize the importance of connectedness in the classrooms include

- Increased motivation and investment: The feeling of connectedness makes the students work harder and enjoy the academic process more.
- Increased retention: Through connectedness, students could better internalize and understand the course material.
- Feeling of a sense of security and comfort: The more connected students feel, the more comfortable they are in class, which in turn leads to increased participation in class activities.

Teachers could play a great role in increasing connectedness in the classroom. Some means through which teachers could enhance connectedness in students are given below:

- Show excitement: Students enjoy learning from instructors who are truly excited about teaching and passionate about the material they are teaching.
- Show interest in students' personal lives and well-being: Students always appreciate caring teachers. This caring approach not only helps to start the class in a positive manner, but also builds a sense of solidarity between students, as well as between students and the teacher.

Strive to create an open and inviting atmosphere. Students love to attend to teachers who set an open and inviting tone in their classes.

Keep classes engaging: Students enjoy class more when their teacher integrates mini exercises, group activities, demonstrations, discussions, and short videos into class sessions.

Remind students about resources outside the classroom: Students appreciate referring to relevant and important resources outside the classroom. These reminders could encourage the students to explore their environment.

Conclusion

Effective connectedness in education leads to numerous benefits including better persistence, engagement and effort in the educational institution, as well as greater academic self-concept in students and their confidence in their ability to succeed. In general, a strong positive correlation could be established between positive student-instructor connectedness- both inside the classroom and out- and student learning and development. The investigator strongly aspires to project through this analysis, the impact of generating a fusion of 'Ingenuity' and 'Connectedness' as the classical title for the futuristic classroom, which is aspired to be materialised through the Taxonomy of Ingenuity and Connectedness.

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WEBWINDOW

LATEX

LATEX (pronounced lay-tech) is a document preparation system for producing professional-looking documents, it is not a word processor. It is created in 1985 by the American computer scientist Leslie Lamport as an addition to the TeX typesetting system. It is most often used for medium-to-large technical or scientific documents but it can be used for almost any form of publishing. Over the years it has been used to typeset many science, mathematics, and engineering journals. The American Mathematical Society (AMS) even has its own set of extensions, called AMS-LaTeX, that contributors use for its journal.

Producing a LaTeX document begins with a text file containing content that is tagged with special LaTeX codes used to indicate how the text will be styled. When the file is run through a LaTeX processor, typeset pages are produced. Because LaTeX typesetting requires wrapping text in complicated computer codes, it has a fairly steep learning curve. Although there are now software programs that help automate the creation of LaTeX documents, a working knowledge of LaTeX is still desirable for this kind of typesetting.

LaTeX Features

- Typesetting journal articles, technical reports, books, and slide presentations.
- Control over large documents containing sectioning, cross-references, tables and figures.
- Typesetting of complex mathematical formulas.
- Advanced typesetting of mathematics with AMS-LaTeX.
- Automatic generation of bibliographies and indexes.

- Multi-lingual typesetting.
- Inclusion of artwork, and process or spot colour.
- Using PostScript or Metafont fonts.

In preparing a LaTeX document, the author specifies the logical structure using simple, familiar concepts such as *chapter*, *section*, *table*, *figure*, etc., and lets the LaTeX system handle the formatting and layout of these structures. As a result, it encourages the separation of the layout from the content – while still allowing manual typesetting adjustments whenever needed. This concept is similar to the mechanism by which many word processors allow styles to be defined globally for an entire document, or the use of Cascading Style Sheets in styling HTML documents.

One of the most important reasons people use LATEX is that it separates the content of the document from the style. This means that once you have written the content of your document, we can change its appearance with ease. Similarly, you can create one style of document which can be used to standardize the appearance of many different documents. This allows scientific journals to create templates for submissions. These templates have a pre-made layout meaning that only the content needs to be added.

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GuruJyothi Research and Reflections

(An Interdisciplinary Peer Reviewed
Biannual Research Journal)

Sree Narayana
Training College
Nedunganda

Principal
Sree Narayana Training College
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MODERNISING THE EDUCATION DRIVE THROUGH ANIMATIONS

Chitra S.

Introduction

Technology is developing swiftly in the 21st century and these developments are bringing many innovations in education sector as well. The use of technology in education influences teaching and learning environments. It's time to adapt students with interactive learning systems so that they can improve their learning, catching, and memorizing capabilities. Technology becomes indispensable to create high quality and realistic leaning environment for students at all levels.

Animation as a multimedia tool is at the forefront of the current digital learning environment. It has been suggested that with the use of animation in education, there is a significant increase in the attitudes and academic achievements of the students in a positive way. Animations, as technological tools used in education, have contributed a lot to the students in terms of security, speeding and slowing time, examining very rare

Abstract

The present paper analyses the role of animation as a multimedia tool in the educational landscape. The use of technology in education revamps teaching and learning environments. Animation as a multimedia tool is at the forefront of the current digital learning platforms. With the use of animation in education, there is a significant increase in the attitudes and academic achievements of the students in a positive way. Animation allows for the design of education and training by offering a wider variety of learning processes and richer educational environments for learners. It is undoubtedly an incredible visual stimulant, which helps to visualize even the most complex information by creating a positive e-learning environment for everyone. In this era of digital strategy, a lot of animations are utilized on the internet for educational purposes. The creative potential of animation is enormous, and integrating animation activities into the school curriculum offers the possibility of tapping this potential to meet a wide range of educational objectives. It is found out that animations leave a deep-rooted impression on the malleable intellect of the learners.

Keywords: Animation, Educational Animations

events, simplifying complicated systems, being useful and cheap and motivation as well as providing a significant increase in students' attitudes and academic achievements towards the content/courses in positive manner. Animation allows for the design of education and training by offering a wider variety of learning processes and splendid educational environments for learners.

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Animation

Animation is a valuable e Learning tool and a training medium which offers exciting possibilities for meeting the needs of 21st century learners. It is undoubtedly an incredible visual stimulant, which helps to visualize even the most complex information by creating a positive e-learning environment for everyone. **Animation** is a method of photographing successive drawings, models, or even puppets, to create an illusion of movement in a sequence. To create the appearance of smooth motion from the drawn, painted, or computer-generated images, frame rate, or the number of consecutive images that are displayed each second, is considered. Animation can bring concepts or imaginations to real life through character sketching. Moving characters are usually shot "on twos" which just means one image is shown for two frames, totaling in at 12 drawings per second. 12 frames per second allows for motion but may look choppy. In the film, a frame rate of 24 frames per second is often used for smooth motion animation. There are several types of animation that employ different techniques to achieve their desired effect.

Different Types of Animation :

- Traditional Animation
- 2D Animation (Vector)
- 3D Animation
- Motion Graphics
- Stop Motion

Traditional Animation

This is one of cinema's oldest forms of animation. It's called cell animation, sometimes. Objects in traditional animation are drawn on transparent celluloid paper. The animator must draw every frame in order to create the animation sequence. Most frequently, Traditional animation is 2D animation.

2D Animation (Vector)

2D animation can fall under traditional animation. But there is something called Vector-based animation that can be 2D and not considered traditional. With Vector-based, the motion here can be controlled by *vectors* rather than *pixels*. Images with familiar formats like JPG, GIF, BMP, are pixel images. These images cannot be enlarged or shrunk without affecting image quality. Vector graphics don't need to worry about resolution. Vectors are characterized by pathways with various start and end points, lines connecting these points to build the graphic. Shapes can be created to form a character or other image. Below is an example.

Vector-based animation uses mathematical values to resize images, so motion is smooth. They can re-use these creations so the animator doesn't need to keep drawing the same characters over and over again. You can move around these vectors and animate that way. This is also helpful for animators who aren't the best drawers.

3D Animation

Today, 3D animation or computer animation is the most common type. But just because computers have stepped in instead of actual drawings, it's not necessarily easier. The computer is just another tool, and 3D animation is still a long, intense process.

In 3D animation, the animator uses a programme to move the character's body parts around. They set their digital frames when all of the parts of the character are in the right position. They do this for each frame, and the computer calculates the motion from each frame. Animators adjust and tweak the curvatures and movements their characters make throughout.

3D animation is also unique in that, unlike 2D, or other traditional methods, the character's entire body is always visible. If a



character turns to the side, the animator only needs to draw the side profile in 2D animation, but in 3D, the entire body still needs to be visible. So again, even though computers are being used, with new technology comes with way more considerations.

Whether you're using drawing in 2D or computing in 3D, animators and filmmakers alike look to storyboards to plan out each frame. Unlike live-action, animation movies can't rely on camera tricks in a shot. Storyboards are the lifeline for creating animation.

Motion Graphics

Motion Graphics are pieces are digital graphics that create the illusion of motion usually for ads, title sequences in films, but ultimately exist to communicate something to the viewer. They're often combined with sound for multimedia projects. They're a type of animation used mostly in business, usually with text as a main player.

Stop Motion

Stop motion animation encompasses claymation, pixelation, object-motion, cutout animation, and more. But the basic mechanics are similar to traditional animation or a flipbook. However, instead of drawings, stop motion adjusts **physical objects** in each frame. If moved in small increments, captured one frame at a time, the illusion of motion is produced. Whether puppets, clay, or even real people, these manual adjustments can make it a long, arduous process.

2.7 Animation in Education


Graphic representations of different styles are now given much more weight in the educational enterprise than they have ever been before. As animations have become increasingly ubiquitous in multimedia learning environments, the range of educational roles they have been given has expanded enormously. Animation is an art that plays a very crucial role in the all-

expansive tech fairy. Young students are fascinated by animation and animated stories and they enjoy the opportunity to create their own. In this era of digital strategy, a lot of animations are utilized on the internet for educational purposes. The creative potential of animation is enormous, and integrating animation activities into the school curriculum offers the possibility of tapping this potential to meet a wide range of educational objectives. There are various benefits that animation provides to the teachers and students. It plays a very important role towards the upliftment of educational procedures and enhance the teaching-learning process by achieving the desired educational outcomes.

The educational benefits of animation arise from its capacity to portray temporal change directly and explicitly. Teachers are always looking for better and innovative ways to improve the education techniques for the students. Research suggests children tend to learn better when they are enjoying the study. It's scientifically proven that retention of information is higher when it is communicated using both visual and verbal communication. These attributes allow animation to provide a better match between the way a subject is presented and the needs of the learner.

Animation serves mainly two functions in education. First purpose of animation in academics is to fulfill a cognitive function. In this role, animations are intended to support students' cognitive processes that ultimately result in them understanding the subject matter. Animation can be used to make very exciting and fun animations into which education and training can easily be incorporated. Instructors can also use animation to demonstrate things and concepts visually exactly how they want to since they have control of every aspect of the animation.

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It can be used to show how things come together and work together. In science for example, the computer animation might be used to show how nuclear fission occurs. Other subjects such as English, Mathematics, music, art etc. can also be taught by using animation. Secondly, as an affective learning tool that attracts attention, engages the learner, and sustains motivation aspect. Such Affective Animation Training is not focused on facilitating comprehension of any academic subject matter itself and often portrays activities that are interactive, creative, fun and motivational.

According to Lowe and Schnitz (2014), the following set of principles are to be considered in the design of animation for use in multimedia learning resources.

- Principle I : People learn better from an animation when the instructional purpose of the animation has been clearly defined.
- Principle II : People learn better from an animation when appropriate emphasis is given to spatial versus temporal information.
- Principle III : People learn better from an animation when perceptual attributes and cognitive requirements are closely aligned.
- Principle VI : People learn better from an animation when perceptual processing and cognitive processing are appropriately supported.
- Principle V : People learn better from an animation when interaction and opportunities accord with aims and learner expertise.

2.8 Benefits of Animation as an Effective Learning tool

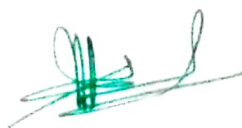
- Emphasises development of students' skills and understanding of creating and responding.
- Enables students to apply creativity and critical thinking.
- Enables students to invent and explore multiple solutions to a problem.
- Enables students to understand the value of reflection and critical judgment in creative work.
- Facilitates positive peer interaction, including receiving and using feedback.
- Encourages self-motivation to create and problem solve.
- Uses artistic literacy as a natural enhancement to learning in other content areas.
- Fosters positive attitudes toward Art & Animation.
- Introduces career possibilities.

Advantages for Primary Students

- Ignite the creative potential of students at a young age.
- Perfect introductory tools to learn animation.
- Can be used for presentations/ assignments in science, history, geography, language classes as well as in after school programmes.
- Contribute to increase focus and concentration in class while having fun

Advantages for Secondary Students

- Strengthen students' talent and skill set
- Strong tools to teach foundation of animation
- Promote creativity and motivate students
- Incorporate animation into different subjects to create more engaging presentations
- Develop story telling skills



2.9 Educational Animations

The benefits of incorporating educational animations that enhance the teaching-learning process in schools are manifold. It accelerates the overall expansion of a student's skills, by augmenting their grasping ability and problem-solving.

Educational animations visualize the textual materials and assist learners understand complicated or abstract concepts better. An animated cartoon is a film for the cinema, television or computer screen, featuring some kind of story or plot, which is formed exploitation drawings. Earlier Animated Cartoons were meant for the purpose of entertainment only. But in these days' they are being extensively used for other functions as well. Animated Cartoons are now being used for education and spreading awareness amongst people in addition to fun and entertainment.

The benefits that can be reaped by inclusion of animation in education are many. Animated

educational videos enhance creativity in learners and motivate them to explore complex dimensions of knowledge. The skills set of students gets honed through animated cartoon-based teaching. Presentations can be made more engaging by incorporating animation. Lessons can be narrated in story form which improves comprehension of the contents.

For the effective utilization of animation in education, understanding the students is important. They have grown up with technology surrounding them and it is in fact, an important part of their daily lives. Since students are more accustomed to advanced technology, they expect the use of similar technology in school also. Students these days need tools which support education in a creative and interesting manner. It is the duty of the teachers to motivate them to concentrate more in studies and along the way, create a worthwhile experience for them. Teachers should provide them the support and assistance as and when needed.

Drivers, Barriers and Success factors of implementing Animation in Education

Pedagogical

- Need for 21st century skills
- Students learn differently and interestingly
- Need for student-centered, media-rich and innovative practices

Technological

- Increased access to media-saturated world and digital communication
- Introduction of smart/hi-tech class rooms
- Greater number of mobile devices

Social

- New generation of tech-savvy teachers
- Learners proficiency with technology and affinity for animation

DRIVERS

BARRIERS

Technological

- Difficulties in technology access
- Poor internet connections
- Quality of equipments
- Difficulties with maintenance services

Legislative

- Requirements for special learners
- Deficiencies in Government funding
- Weak educational policies and programmes

Behavioural

- Attitude of the stakeholders
- Teachers' poor proficiency with technology
- Lack of time

Resource-based

- Unavailability of OER with animation
- Low quality of available e-resources
- Deficiencies in professional training programmes
- Absence of technical support

SUCCESS FACTORS

Apply animation principles in learning

- Functions of animation
- Spatial and temporal Information
- Perception and Cognition
- Verbal and Pictorial guidance
- Interactive learning

Build a foundation for learners

- Provide learners with edutainment
- Understand how to use animation in education

Invest in professional development

- Use animation technologies for teacher training programmes

Support from the authorities

- Empower and equip educators to incorporate animation into teaching.

Conclusion

Animation is a powerful digital tool and can work wonders if used in the right way. Hence, teachers and educational institutions should work together and use animation as an innovative tool to provide effective education to the students. They can create and use animated instructional materials keeping in mind that the content should be short, appropriate, and deliver clear message with least effort. Thus animations leave a deep-rooted impression on the malleable intellect of the learners.

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MENTAL FATIGUE AMONG ENGINEERING COLLEGE STUDENTS

Amjith S.

Mental fatigue among Engineering college students is a serious factor which alters their alertness and make them suffer in their cognitive function. It hampers productivity, irritability, and loss of appetite, insomnia, hormonal imbalance. Mental fatigue leads to serious health and psychological problems including anxiety.

Mental Fatigue can be defined as a state of reduced mental alertness that impairs performance. It may arise due to constant decision making, cluttering, medication, stress and ailments such as depression, fibromyalgia and autoimmune disease. It can be acute or chronic. Acute fatigue is short lived and is relieved after a brief period of rest which is normal in hectic life. But if it remained unaddressed, acute fatigue leads to chronic fatigue and ultimately leads to burn out. Although there is no actual cure for mental fatigue, it is better to try remedies in natural ways.

Abstract

Mental fatigue among Engineering college students arise due to constant decision making, cluttering, medication, stress and ailments such as depression, fibromyalgia and autoimmune disease. It can be acute or chronic. Acute fatigue is short lived and is relieved after a brief period of rest which is normal in hectic life. But if it remained unaddressed, acute fatigue leads to chronic fatigue and ultimately leads to burn out. Although there is no actual cure for mental fatigue, it is better to try remedies in natural ways. The main objectives of the study are to find out the extent of mental fatigue among Engineering students and to find out whether there is any difference in the mental fatigue among Engineering students with respect to gender and in different streams. Normative survey method is done using Mental Fatigue Scale among 70 engineering college students located in Attingal area of Trivandrum district. Statistical Techniques used were percentage analysis, t test and ANOVA. From the study, it was found that the extent of Engineering College students is average. Male engineering students showed more values in mental fatigue than that of female engineering students but there is no difference in mental fatigues with respect to different streams such as Mechanical, Electrical and Computer Engineering College students. Implications of the study suggests to includes yoga, medication, physical education, individualized instructions, proper rests and sleep should be given to students before starting the class.

Keywords: Mental fatigue, Engineering college student, depression, fibromyalgia and autoimmune disease.

1.1 NEED AND SIGNIFICANCE OF THE STUDY

Mental fatigue can happen when we extent too much stress on a task. Engineering students are expected to suffer the most

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in their professional as well as personal life as the field offers restricted curriculum which is lack of entertainments. Engineering world is a highly competitive field as the science and technology is rapid growing one and the students have to articulate their competence in technical and intellectual ways. The field includes continuous assessment, projects, pressure from teachers, peers as well as parents may leads to depression. Due to their strict curriculum and competition, suitable measures have to find out to overcome it. If the issues are left untreated, these can become devastating and life threatening.

Rajeswari, Hemanathan; KurupSreelekha, Bhaskara; Nappinai, Seran ; Subrahmanyam, Udathu; Rajeswari, Vaidyanathan (2020) conducted a study on Impact of accelerated recovery program on compassion mental fatigue among 120 nurses in South India through simple random sampling. Results showed that there was a statistically significant difference in the ProQOL score between the intervention and control groups, which demonstrated a significant difference between the groups.

Li, Gang; Huang, Shan; Xu, Wanxiu et.al. (2020) conducted a study on "The impact of mental fatigue on brain activity: a comparative study both in resting state and task state using EEG". Twenty healthy male engineering participants were recruited to do a consecutive mental arithmetic task for mental fatigue induction, and electroencephalogram (EEG) data were collected before and after each task. The power and relative power of five EEG rhythms both in resting state and task state were analyzed statistically. The results of brain topographies and statistical analysis indicated that mental arithmetic task can successfully induce mental fatigue in the enrolled subjects. Furthermore, we found that it is of great physiological significance to divide alpha frequency band into alpha1 band and alpha2 band in fatigue related studies, and at the same time improve the statistical differences of sub-bands. While referring so many books, journals etc, the researcher found that, there was a scarcity of research in the field of mental fatigue among engineering college students. Hence the researcher decided to conduct a study in order to fill the knowledge gap in the respective field.

1.2 TITLE OF THE PROBLEM

The problem is entitled as "MENTAL FATIGUE AMONG ENGINEERING COLLEGE STUDENTS"

1.3 DEFINITION OF THE KEY TERMS

Mental Fatigue

"A condition of low alertness or cognitive impairment usually associated with prolonged mental activities or stress"

Engineering college students

A person trained and skilled in the design, construction and use of engines or machines or in any of various branches of engineering; a mechanical engineer, a civil engineer"

1.4 OBJECTIVES

- 1) To find out the extent of mental fatigue among Engineering students
- 2) To find out whether there is any difference in the mental fatigue among Engineering students with respect to gender.
- 3) To find out whether there is any difference in the mental fatigue among Engineering students with respect to different streams.

1.5 HYPOTHESES

- 1) The extent of mental fatigue among Engineering students is average.
- 2) There is no significant difference in the mean scores of mental fatigue among Engineering students with respect to gender.
- 3) There is no significant difference in the mean scores of mental fatigue among Engineering students with respect to different streams.

1.6 PLAN AND PROCEDURE

a) Method

Normative survey method as adopted in the study.

b) Population and Sample

The population consists of the Engineering students located in Attingal area of Trivandrum district.

A sample is the subset of population and the investigator selected 70 students who are studying in various engineering college students located in Attingal area of Trivandrum district.

c) Tools

Mental Fatigue Scale developed by the investigator which consists of 30 questions.

d) Statistical technique

- i) percentage analysis
- ii) t-test
- iii) ANOVA

1.7 DELIMITATION OF THE STUDY

1. This study was delimited to Engineering students only.
3. Only 70 students belong to Attingal area of Trivandrum district were selected as samples.

1.8 ANALYSIS AND INTERPRETATION OF DATA

Hypotheses testing using percentage analysis

Hypothesis-1

- 1) The extent of mental fatigue among Engineering students is average.

TABLE 1.01

Extent of Mental Fatigue among Engineering College Students

Extent of Mental Fatigue	low	%	average	%	high	%
	10	14.29	24	34.29	36	51.43

From the table 1.01, it was inferred that 14.29% of Engineering students have low level of mental fatigue, 34.29% of Engineering students have average level of mental fatigue, and 51.43% of Engineering students have high level of mental fatigue. From the analysis, it was found that the Hypotheses 1 "The extent of mental fatigue among Engineering students is average" is rejected. This showed that the extent of mental fatigue among Engineering College students is high. Due to the restrictions in their curriculum and competition in field, engineering College students suffer mental fatigue in high level.

HYPOTHESES TESTING USING t-TEST

HYPOTHESIS - 2

- 2) There is no significant difference in the mean scores of mental fatigue among Engineering students with respect to gender

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TABLE 1.02
Data and Results of t-Test: Comparison of Male and Female Students in their Mental Fatigue

Variable	Gender	N	Mean	SD	t	Remarks
Mental fatigue	F	28	125.5	3.235	7.964	S
	M	42	119.3	3.124		

From the table 1.02, it was found that the calculated t- values were greater than that of table value 1.97 at 0.05 level of significance. Therefore, on the basis of result, hypothesis -2 "There is no significant difference in the mean scores of mental fatigue of engineering students with respect to gender" was rejected. From the mean values, it was found that male engineering students showed more values in mental fatigue than that of female engineering students. This may be due to the fact that society is expecting more from male engineering students than from female and it may cause an additional stress to the students in addition to their curricular strain.

HYPOTHESIS TESTING USING ANOVA
HYPOTHESIS - 3

3) There is no significant difference in the mean scores of mental fatigue among Engineering students with respect to different streams.

TABLE 1.03
Data and Results of t-Test: Comparison of Mechanical, Electrical and Computer Engineering College Students in their Mental Fatigue

TABLE 1.03
Data and results of ANOVA-test: Comparison of Mechanical, Electrical and Computer Engineering College students

Variable	Sum of squares		df		Mean square variance			Remarks
	Between	Within	Between	Within	Between	Within	V	
mental fatigue	90.783	6345.23	2	67	45.3915	94.705	2.086	NS

The F- value presented in the Table 1.03 revealed that there existed no significant differences among student in their mental fatigue since the calculated F value lesser than that of the table value for the degrees of freedom (67,2) at 0.05 level of significance. Therefore, on the basis of the result given in the table 1.03, Hypothesis 3, "There is no significant difference in the mean scores of mental fatigue of engineering students with respect to different streams" was accepted. From the mean values, it was found that Engineering students showed no difference in mental fatigue with respect to streams such as Mechanical, Electrical and Computer Engineering College students. Even though there are of different streams, they are facing the society with same attitude and have same educational pattern.

1.9 FINDINGS

1. The extent of mental fatigue among Engineering College students is average.
2. Male engineering students showed more values in mental fatigue than that of female engineering students.

3. Engineering college students showed no difference in mental fatigues with respect to different streams such as Mechanical, Electrical and Computer.

1.10 CONCLUSION OF THE STUDY

From the study, it was found that the extent of Engineering College students is average. Male engineering students showed more values in mental fatigue than that of female engineering students but there is no difference in mental fatigues with respect to different streams such as Mechanical, Electrical and Computer Engineering College students.

1.11 IMPLICATIONS OF THE STUDY

1. Yoga, Meditations should be given to students before starting the class.
2. Physical Education classes should be given to students
3. Individualized instruction should be given to students
4. Suitable gap should be given in between the period of instruction
5. Encourage them to have proper rest and sleep.

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<https://www.dictionary.com/browse/engineer>


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GURUJYOTHI RESEARCH AND REFLECTIONS

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Ceena Chacko & Dr. Rosamma Philip

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Dr. Suma K.O.

Awareness and Attitude of Secondary School Students towards Social Science
Learning with regard to Edutainment
Anju Krishna K.S. & Dr. Sheeba P.

Making Learning an Active and Creative process with the help of Computer Graphics Organizers
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An Investigation on the Influence of Family on Consumer attitude of Higher Secondary School Students
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Sheena Joseph & Dr. Sreevinda Nair N.

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EFFECTIVENESS OF MULTIMEDIA LEARNING PACKAGE ON PISCICULTURE FOR ENHANCING OCCUPATIONAL AWARENESS AMONG HIGHER SECONDARY SCHOOL STUDENTS

Dr. Dhanya B. Chandran

1. INTRODUCTION

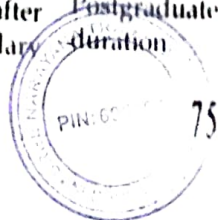
The role of education in facilitating social and financial progress has long been recognized. Education expands practical and analytical ability and thereby opens up opportunities for individuals and groups to achieve greater access to labour markets and livelihoods. Education is not only an instrument of enhancing efficiency but is also an effective tool of widening and augmenting democratic participation and upgrading the overall quality of individual and societal life. India's present education system mainly encompasses primary education, secondary education, senior secondary education, and higher education. Elementary education consists of eight years of education. Each secondary and senior secondary education consists of two years of education. Higher education in India starts after passing the higher secondary

Abstract

Multimedia combines text, graphics, animation, audio, and video which are everything we can see and hear in our daily life. (Vaughan, 2006). This study finds out the multimedia application for educational purposes. Multimedia learning strategy helps to increase student retention, develop various skills and promote students' self-esteem and high-level thinking. A multimedia learning strategy can bridge the gap between theory and practice in the classroom by allowing students to practice what they have learned in a safe and controlled environment. In schools, technology curricula include multimedia presentations as a required skill for students. The present study attempts to find out the effectiveness of multimedia learning package for enhancing occupational awareness among higher secondary school students regarding Pisciculture. The sample of the present study consisted of 60 higher secondary school students. The results of t-test analysis of the pre-test and post-test mean occupational awareness score revealed a statistically significant difference between occupational awareness levels of higher secondary school students. From this, it can be inferred that the multimedia learning package effectively enhances occupational awareness on Pisciculture among higher secondary school students.

Keywords: Multimedia Learning Package, Occupational Awareness, Pisciculture, Higher Secondary School Students

education or the 12th standard. Depending on the stream doing graduation in India can take three to five years. Postgraduate courses are generally of two to three years of duration.



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Technical and Vocational Education plays a vital role in the country's human resource development by creating skilled human resources, enhancing industrial productivity, and improving the quality of life. Vocational training refers to lower-level education and training for professional or semi-skilled workers in various trades. It does not enhance their level concerning general education. If given extreme attention, vocational education will produce graduates who will be self-employed and can deliver goods of export quality, thereby increasing our foreign earnings. If the youths are given the proper training in vocational education, it will create jobs for our teeming children that are roaming in the street, and this will consequently lead to a reduction in social vices such as robbery, stealing, prostitution, rapping, drug addiction, etc

They keep in mind that the education system should cater to the needs of the manpower requirement for the country's economic development. The government of India has accorded high importance to vocational education and training. While elaborating on the essence and role of Education, the National Policy on Education (NPE), 1986 (as modified in 1992) has recognized that Education develops workforce for different economic levels. The NPE also envisages the introduction of systematic, well-planned and rigorously implemented programmes of vocational education, which can be rigorously enforced to enhance employability, reduce the mismatch between demand and supply of skilled manpower, and provide an alternative to those pursuing tertiary education without particular interest or purpose. The policy envisages that efforts will be made to provide children at the higher secondary level with generic vocational courses that cut across several occupational fields and are not occupation-specific.

Vocational Education, in a much broader sense, covers education and skill development at all levels from post-primary to tertiary education - both through formal and non-formal programs. Vocational Education at the +2 stage, also known as higher secondary stage, develop competencies (knowledge, skills, and attitude) required by a specific occupation or a group of occupations, through diversified vocational courses to prepare pupil for the world of work, especially for self-employment.

The significance of vocational education is very important in this age. Vocationalisation of Education aims at rising employment potential of the people through education for self-employment which emphasis agriculture and allied occupations, including miniature, small, cottage and agro-industries or through training for specific competencies in different vocations. Moreover, it is to impart life skills required by the youth to enter the world of work and assume the responsibilities of adulthood. A number of aquaculture practices are used world-wide in three types of environment i.e., freshwater, brackish water, and marine for a great variety of culture organisms. Freshwater aquaculture is carried out either in fish ponds, fish pens, fish cages or, on a limited scale, in rice paddies. Brackish water aquaculture is done mainly in fish ponds located in coastal areas. Marine culture employs either fish cages or substrates for molluscs and seaweeds such as stakes, ropes, and rafts.

The fish species which live and grow in fresh water is called fresh water fish. Fish species of fresh water fish farm cannot be survive in salt water. Some of the fresh water fish species are Catla, Bele, Rui, Mirgal, Tilapia, Rohu, Common Carp, African Catfish, Snakehead, Eel, Trout, Gouramy, Trout, Pike, Tench, Salmonids, Palaemonids, and the giant freshwater prawn *Macrobrachium* etc. Freshwater aquaculture refers to raising and



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breeding aquatic animals (fish, shrimp, crab, shellfish, etc.) and plants for economic purposes by the use of ponds, reservoirs, lakes, rivers, and other inland waterways (including brackish water), which play an important role in the aquaculture industry

Integration of technology in education is the need of the hour. Technology enhanced learning will play a very important role in the development of a lifelong learning culture and has the capacity to empower learners by providing them with multiple pathways. Using technology in classrooms can greatly enhance the efficacy of student's learning and academic achievement. In this sense multimedia is powerful tool which can provide individual or group interaction with adequate motivation in entertainment environment.

Multimedia applications can be defined as an application that uses a combination of many media sources such as texts, graphics, audios, videos and animations. It is often used to deliver information which is more powerful than printed learning resources such as printed text book. It also allows users to interact with the information quickly and accurately. Educational multimedia applications enable students to get information in various formats. Examples of multimedia applications are World Wide Web, courseware, interactive TV, computer games, and virtual reality. There has been an increase in demand of educational multimedia applications at all level of citizens for them to apply their knowledge in different field of study and situations. Multimedia applications had greatly influenced the education in many ways. They give teachers or lecturers to prepare study materials for students in a more clearly and comprehensive way such as demonstrate and visualize the study material in a multimedia presentation (Milkova, 2012). Multimedia applications can also be used as a source of information.

Multimedia applications can be developed to enhance the learning process and increase the interaction between students and lecturers. Lecturers can make the lessons more interesting by using the multimedia presentations. As the information is presented in variety ways, multimedia applications enhance the user experience and make the lessons easier to grasp the info (Singh, 2011).

2. NEED AND SIGNIFICANCE OF THE STUDY

India has one of the most significant technical workforce in the world. However, compared to its population it is not significant and there is a tremendous scope of improvement in this area. In India, the emphasis has been on general education, with vocational education at the receiving end. This has resulted in large number of educated people remaining unemployed. Kerala is the state known for its literacy. There are many people in our state today who have got higher education in various fields. Most of them are unemployed. This is due to the inadequacy of vocational education. It is common in our country today for many people to be unemployed with a bachelor's or master's degree. Vocational education is the way to do this. Vocational education should be made available to all students from the school level. Nowadays, education is not only a means of acquiring knowledge but also a means of earning a living. Vocational education can help avoid unemployment and lead the country to progress.

The field of education is changing rapidly. Multimedia has a huge impact on education. The application of multimedia in education is quite obvious. In modern day, classroom is equipped with latest electronic audio and video gadgets. Using multimedia, especially with the advent of PC-based system, there is a scope and efforts to integrate all these in one system. With the introduction of multimedia, several new aspects are being included in the

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domain of educational technology. Multimedia approach can stimulate the inquisitiveness among the learners and give them vivid impressions. With multimedia, the learning becomes more focused, mainly because the developmental-based educational kits have to be restricted to a narrow focused domain. This benefits the user in terms of customized in-depth learning. Students are inside and submerged in the learning module. It helps to retain the information for a long time. The graphical user interface allows the learner to experience the simulated real like environment. While interacting with the learning module, students also receive explanations for a set of actions embedded in the multimedia application. Effective remediation programmes can be implemented through the multimedia approach. It provides direct or firsthand experience to the students.

Many schools use different types of computer based teaching software based on multimedia. Teachers or lecturers can make the lesson more interesting by using the multimedia applications. In the present study, while preparing the Multimedia Learning Package on Pisciculture the investigator takes proper care to include content to enhance Occupational awareness in Pisciculture among Higher Secondary School students. It can help the students to learn more effectively, interestingly and thereby increase their occupational awareness in Pisciculture. It is hoped that the Multimedia Package being employed in the study helps to develop in students a positive attitude towards Pisciculture as an income generating occupation or a part-time business. It helps the learners to find his own her employment. It inculcates mental courage in the learner to face unfavourable situation and also enable the learner to understand social problems and react appropriately.

3. OBJECTIVES OF THE STUDY

The objectives of the study are:

- 1) To prepare and validate a Multimedia Learning Package on Pisciculture for enhancing occupational awareness among Higher Secondary School students
- 2) To test the effectiveness of the Multimedia Learning Package on Pisciculture by comparing the Pre and Post test scores of the treatment group
- 3) To compare the Post test scores of Higher Secondary School students for the subsample based on Gender

4. HYPOTHESES OF THE STUDY

The hypotheses formulated are given below:

- 1) The Multimedia Learning Package is effective for enhancing occupational awareness on Pisciculture among Higher Secondary School students
- 2) There is a significant difference in the mean Post-test scores of Higher Secondary School students based on Gender

5. METHODOLOGY OF THE STUDY

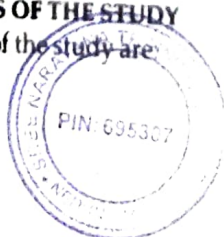
The experimental method was adopted for the present study for determining the effectiveness of Multimedia Learning Package on Pisciculture. A sample of 60 Higher Secondary School students in Kerala state was selected for the study. The experimental design adopted in the present study was non-equated single group 'Pre-Test Post- Test' design. The collected data were subjected to statistical analysis in order to verify the hypotheses.

6. SAMPLE SELECTED FOR THE STUDY

The study was conducted on a sample of 60 Higher Secondary School students (N=60) in Kerala.

7. TOOLS AND MATERIALS USED

1. A Multimedia Learning Package developed on Pisciculture for Higher Secondary School students (Prepared by the Researcher)
2. Occupational awareness on Pisciculture for students studying in Higher



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Secondary School (Prepared by the Researcher)

8. STATISTICAL TECHNIQUES USED

The researcher used the statistical techniques such as Arithmetic Mean, Standard Deviation, t-test and z-test, for analysing the data.

9. RESULT AND DISCUSSION

The effectiveness of the Multimedia Package on Pisciculture for enhancing occupational awareness among Higher Secondary School students was tested by comparing the Pre and Post test scores of experimental group.

9.1 COMPARISON OF PRE-TEST AND POST-TEST SCORES OF STUDENTS IN THE EXPERIMENTAL GROUP

The Pre-Test and Post-Test scores of students in the experimental group were compared using test of significance of difference between two means (t-test). The details of the comparison of the Pre-Test and Post-Test scores of treatment group are given in the Table 1

Table 1

Data and results of test of significance of Pre-Test and Post-Test Scores of students in the experimental Group

Groups	Number	Mean	S.D	t-value	Significance
Pre-Test	60	9.35	4.13	16.87	Significant
Post-Test	60	21.67	3.87		

't' value is significant at 0.05 and 0.01 level of significance

From the Table 1, it is clear that the 't' value obtained is 16.87, which is greater than the table value at 0.01 level. Therefore there is significant difference between the mean Pre-Test and Post-Test Scores of students in the experimental Group ($C.R=16.87; p<0.01$) and the mean of Post-Test ($M=21.67$) was greater than that of the Pre-Test ($M=9.35$) for enhancing the occupational awareness on Pisciculture after the experiment. Comparison of Pre-Test and Post-Test Scores of students in the experimental group revealed that there is significant difference between the Pre-Test and Post-Test scores of students. Hence the hypothesis formed in this context viz H1 is accepted.

9.2 COMPARISON OF THE POST-TEST SCORES OF STUDENTS AMONG EXPERIMENTAL GROUP BASED ON GENDER

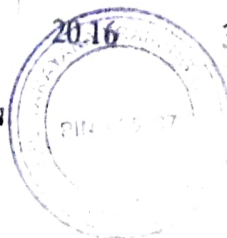
In order to test whether there is any significant difference between the Post-Test scores of Boys and Girls in the Experimental group, the investigator calculated the critical ratio of Post-Test scores. The data and the result of the test of significance are given in the Table 2.

Table 2

Result of Test of Significance of Difference between the Mean Post-Test scores of Boys and Girls in the Experimental Group

Group	No students	Mean	Standard of Deviation	t-value	Result
Boys	26	21.34	3.95	1.76	Not Significant
Girls	34	20.16	3.46		

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't' value is not significant at 0.05 and 0.01 level of significance

From the Table 2, it is clear that 't' value obtained for Post-Test scores of boys and girls in the Experimental Group is 1.76 which is less than the table value at 0.05 level of significance. Hence there is no significant difference between the Post-Test scores of Boys and Girls in the experimental Group. Hence the package is equally effective for both boys and girls.

Comparison of the Post-Test scores of Boys and Girls in the Experimental Group revealed that there is no significant difference between the Post-Test scores of Boys and Girls in the Experimental Group ($t=1.76$). Hence the hypothesis formed in this context viz. **H2** is rejected.

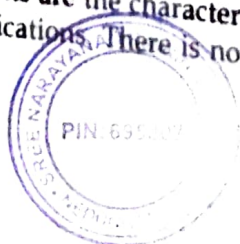
10. CONCLUSION

According to Richard Mayer's Cognitive Theory of Multimedia Learning, information received via auditory and visual channels is processed in different parts of the brain. When students are able to learn through both of these channels simultaneously, they absorb more sensory information and are able to commit more of the lesson to memory. From the findings of the study it was explicitly proved the effectiveness of Multimedia Learning Package for enhancing occupational awareness on Pisciculture. Multimedia applications are excellent tool for educational purposes. It can improve the effectiveness of learning outcome by deliver the information to the students. Multimedia applications can use to deliver information in an interesting way by combining the elements of texts, images, audios, videos, animations and user control. Multimedia applications have a lot of advantages for the education purposes which can help students have further understanding on certain information or topics. Screen design, interaction and feedback, navigation, video and audio elements are the characteristic of multimedia applications. There is no doubt

that the multimedia applications can be used as a tool to assist teachers to achieve educational effectiveness. It is hoped that the Multimedia Learning Package for enhancing occupational awareness on Pisciculture would be helpful to the students to activate their senses, open up new avenues of learning, and get them involved in activities that promote their inquisitiveness and awareness in engaging in worthwhile vocation for earning a living. Moreover, those who continue or discontinue their studies can be equipped to engage in this occupation as part time or fulltime, so that they can secure some form of profitable employment. Vocational education therefore provides an increase in the skill options available to the learner for an effective survival in the economy.

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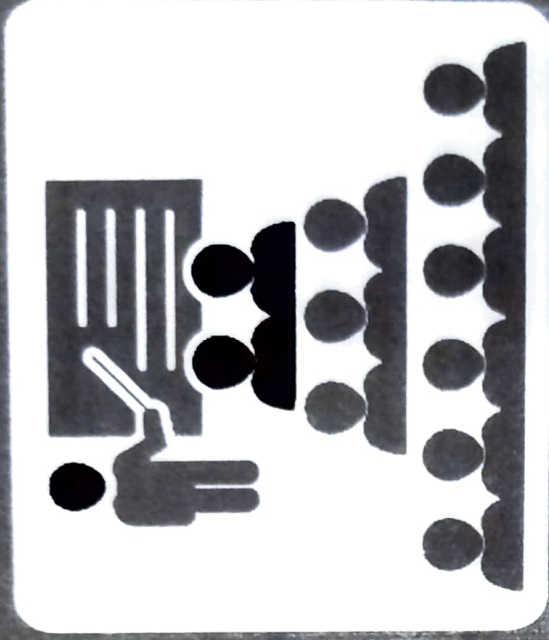
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Research Article

DEVELOPMENT OF A TEACHING APTITUDE TEST BATTERY FOR B.ED. STUDENTS

Jobi Thomas & Smitha S.

Abstract: The revitalization and strengthening of the teacher education system is a powerful means for the upliftment of educational studies in the country. Out of so many teacher training programs for different stages, the secondary teacher education program is considered as a vital one. There is always need to evaluate the efforts which are being made by the training institutions to achieve the desired goal. It is highly recognized that the aptitude of teacher contribute a lot for successful teaching. An aptitude is a special ability or specific capacity which is different from the general intellectual ability which helps an individual to acquire the required degree of proficiency or achievement in a specific field such as in teaching. So, by obtaining the knowledge about the aptitude of prospective secondary teacher trainees it helps us in future references and to predict the degree of attainment or success of teacher trainees in teaching. In view the investigator undertakes the development of a Teaching Aptitude Test for B. Ed. teacher trainees.

Key words: Teaching Aptitude, Test battery

Introduction

“A teacher can never truly teach, unless he is still learning himself. A lamp can never light another lamp unless it continues to burn its own flame”. – Rabindranath Tagore

Education is an important instrument in bringing out potentialities of human beings while effectiveness of a system of education is mainly dependent upon its teachers. That is why, among all the dimensions of education, teacher education is considered to be the most crucial. Teacher education programme is intimately related to the society and is conditioned by ethos, culture and character of the nation. The revitalization and strengthening of the teacher education system is therefore a powerful means for the upliftment of educational studies in the country. Out of so many teacher training programs for different stages, the secondary teacher education program is considered as a vital one. There is always need to evaluate the efforts which are being made by the training institutions to achieve the desired goal. It is highly recognized that the aptitude of teacher contribute a lot for successful teaching. An aptitude is a special ability or specific capacity which is different from the general intellectual ability which helps an individual to



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acquire the required degree of proficiency or achievement in a specific field such as in teaching. So, by obtaining the knowledge about the aptitude of prospective secondary teacher trainees it helps us in future references and to predict the degree of attainment or success of teacher trainees in teaching. Ability concerns itself only with the present condition but aptitude has predictive nature. Also aptitude tests are concerned with specific abilities so the knowledge of aptitude acquaints us with the specific abilities and capacities of an individual to succeed in a particular field of activity like teaching.

Aptitude

"An aptitude is a combination of characteristics indicative of an individual's capacity to acquire (with training) some specific knowledge, skill or set of organized responses, such as the ability to speak a language, to become a musician, to do mechanical work" (freeman (1971)). In the 'Dictionary of Education' aptitude is described as "Pronounced innate capacity for or ability in a given line of endeavour, such as a particular art, school subject or vocation."

Aptitude Testing

An aptitude test is a test designed to discover what potentiality a given person has or learning some particular vocation or acquiring some particular skill. In other words, aptitude test measures abilities and interests. The main function of standardized tests of aptitude is, therefore, to help in estimating the probabilities that a person would be likely to follow successfully in an occupation he is considering.

Types of Aptitude Tests

Aptitude tests may be divided into alternative groups from a number of different points of view. One of the most important of these alternatives relates to the specificity of the aptitude aimed at. On this basis, the tests may be divided into two parts; (i) those designed to detect specific or particular aptitudes; and (ii) those designed to detect general or average aptitudes. There is hardly an aptitude test composed of a single test unit in use at the present time. Batteries are practically the universal form of aptitude test.

Aptitudes are, thus, very important for a person's choice of vocation and his efficiency in the job. If a person chooses a vocation befitting his aptitudes, he

proves successful in his job; and he gets chances of promotion. Success in the job in turn has a great influence on the individual's personality. If an individual proves inefficient in his job, it has an adverse effect on his emotional life, and he is likely to be maladjusted. Thus, aptitudes play a very important part in the development of an individual's personality.


Aptitude for Teaching

There is a great need of making a correct selection of teachers. The persons with high aptitude for teaching should be spotted out through proper testing and advised to join the teaching profession. The service conditions in the profession should be so modified as to attract persons with real aptitude for teaching to join the profession. No person with aptitude for teaching should be tempted to join another profession simply because of better prospects.

With a view to test the teaching aptitude of B.Ed. students of Kerala, the investigator, validated a teaching aptitude test after discussing with educational experts, experienced teachers and experts in the field of psychology and education. It is obvious from the review of literature, that different investigators stress different aspects of teaching aptitude among students. These factors must go hand in hand while developing an aptitude test in teaching. For the development of the Teaching Aptitude Test, the investigator selected ten components from a long list of teaching aptitude dimensions that have been mentioned in the literature and found applicable to class room teaching and learning. Fifty Seven items related to teaching aptitude under the above ten dimensions were prepared.

1. Mental Set and Professional Interest

Learners should have habit of readiness. This habit is also known as law of motivation. Woodworth calls it law of mental set. The teacher should arouse the attention and interest of the students by asking suitable questions. Curiosity is indispensable for learning. It is obvious that if one has interest in this profession, one would naturally have interest in reading because one cannot be upto the mark without having interest in reading. A person having interest in profession would take interest in matters related to education.


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Eg: An effective teacher should:



- (b) experts for teaching a difficult topic can be arranged and others can be benefited from them
 - (c) very large classes are made possible and thus it is economically advantageous
 - (d) All the above
5. Professional Knowledge

This is related to the teacher's built in equipment, beliefs and reaction on the methods of teaching, medium of instruction, evaluation techniques, curriculum, co-curricular activities, behaviour with children, school inspection, classroom interaction and school administration.

Eg:- Which one of the following is the most important quality of a good teacher?

- (a) Punctuality and sincerity
- (b) Content mastery
- (c) Content mastery and reactive
- (d) Sociable

6. Professional Ethics

This is to judge how far a prospective teacher is sincere in his/her work, views and temperament. A prospective teacher should be honest not only in the matters of money, but more so in his/her words and deeds. Also he/she is impartial enough to treat all his/her students equally as also to know the extent to which he/she would be objective in his/her teaching and in his/her treatment.

Eg:- An ideal teacher's qualities are

- (a) Maintaining distance from students
 - (b) Helping students to secure high marks in examination
 - (c) Completion of course before examination
 - (d) Making all possible efforts for student's welfare
7. Problem Solving Ability

This factor is to reveal if a prospective teacher can handle the class effectively. This would also bring out the authoritarian or democratic attitude in him/her. Teacher should be able to identify the reasons of disciplinary problems among students and should try to eliminate them.

Eg:- If you find a child in your class who always isolates from the rest of the class, you would ...

- (a) ask the child to be normal by taking example of his classmates
- (b) try to understand the reason and attempt to solve

- (a) Induce the students to learn
 - (b) Increase pass percentage
 - (c) Help the students in preparing good notes
 - (d) Finish the course in time
2. Emotional Maturity

A stable teacher is an asset to any society. Emotionally matured teachers are most wanted when a country passes through a transition period. The change in society creates upheavals of great consequence which affect the immature minds of the pupils. To mould such pupils to the desired goal is the work of an emotionally stable teacher. Hence, maturity and stability are the precursors of a good stable teacher.

Eg:- Which of the following is the most important single factor in underlying the success of beginning a teacher?

- (a) Scholarship
 - (b) communicative ability
 - (c) personality and its ability to relate to the class and to the pupils
 - (d) organisational ability
3. Social Commitment

Social work cannot be initiated by imitating other people. One must have a positive attitude towards the work. By having positive attitude for social work in ample quota, he would make a successful and efficient teacher. A teacher is always ready to go an extra miles for other people or society.

Eg:- There is fear of social-evils affecting the schools. What will be your attitude to prevent it?

- (a) Indifferent
 - (b) Similar to other teachers
 - (c) Optimistic
 - (d) Pessimistic
4. Technical skill

The knowledge of pedagogy does not make a good teacher. It is the implementation of the knowledge in classroom that makes a good teacher. So a teacher having a repertoire of various skills can make a good teacher. Hence technical skill of a teacher is a great asset that would make him/her an effective teacher.

Eg:- Teaching on TV is superior to class room instruction because

- (a) Teaching materials can be filmed for reuse



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- (c) leave the child alone so that the child comes out of his own
 (d) inform the authorities that his presence may affect the performance of other students in the class
8. Continuous Learner
 A real teacher cannot rest with doing the work assigned to him/her. He/she would be zealous, industrious and insightful to take the lead. He/she should not be only receptive to new ideas, but should take the initiative in discussions.
 Eg:- A teacher learns most from
- (a) Teacher's training (b) Students (c) Books
 (d) Other teachers
9. Attitude towards children
 Attitude towards children includes attitude of the teacher towards the needs, nature, problems, behaviour (of his/her students or fellow teachers), in a group or as individual, inside the school or out of it. This goes to show how a teacher reacts to the children in various situations.

Eg:- Students who ask questions in the class should be-

- (a) Advised to meet the teacher after the class
 (b) Encouraged to participate in the discussion in the class
 (c) Encouraged to continue asking questions
 (d) Encouraged to search answers independently
10. Skill in teaching

Skill in teaching is the fact that a teacher possesses in teaching his/her subject. This is something more than the method of teaching. A skillful person would always lead his/her students to learn with three Es - Easiness, Effectiveness and Economy. He/she would teach without making his/her student feel that they are being taught.

Eg:- Which of the following is related to Teaching Skill ?

- (a) Black-board writing (b) Solving Questions
 (c) Asking Questions (d) All the above

Construction of Test items

A draft test consisting of 57 multiple choice items was prepared. The items were prepared based on the selected dimensions of teaching aptitude. Items were given to experts for getting their suggestions for improvement. The modifications were made accordingly.

Pre-try out

The modified version of 57 item test was administered to twenty five student-teachers and required changes were effected.

Try out

The test was then administered to a group of 100 student-teachers from Teacher education institutions from Thiruvananthapuram and Kollam districts. Enough time was given to students to complete the test. Separate answer sheet was provided for answering. The scoring was done by giving one point credit to each correct response and zero for wrong response.

Item analysis

The quality of each item was established by item analysis. Items with Difficulty Index between 0.3 and 0.7, Discriminating Power above 0.4 were selected for the final test.

Distracter Analysis

The test consists of multiple-choice items only. Hence, there is a chance of guessing the answers. If the distracters were properly given, guessing can be eliminated. So the distracter analysis was done to eliminate defective distracters.

Preparation of Final test

Out of 57 items, 50 items were selected for the final test based on the Difficulty Index and Discriminating Power of items. Items selected were arranged according to their difficulty level starting with easy items. The duration of the test was fixed as 90 minutes (1 1/2 hrs).

Reliability and Validity of the Teacher Aptitude Test

Reliability of the test was ensured by split-half method. Then the reliability coefficient of the whole test was calculated using Spearman Brown Prophecy formula, $R=2r/(1+r)$, with $r=0.71$, and Reliability Index was obtained as 0.84. Hence the test is reliable.

Validity of the Test

Face validity was established by expert's opinion. To ensure the content validity, items were selected from different source, viz, course text books and standard reference books. The items were finalised on the basis of suggestions of subject experts, Criterion related validity also was established by correlating the test score with the First Semester marks scored by the student-teachers. The



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comparison was made for a sample of 80 student-teachers. The validity coefficient of test obtained as 0.82

Table 1 Weightage Given to Various Dimensions of Teaching Aptitude for the preparation of Teaching Aptitude Test

Sl. No	Components	Marks
1	Mental set & Professional Interest	4
2	Emotional Maturity	5
3	Social Commitment	4
4	Technical Skill	4
5	Professional Knowledge	5
6	Professional Ethics	5
7	Problem Solving Ability	6
8	Continuous Learner	5
9	Attitude towards Children	4
10	Skill in Teaching	8
	Total	50

Objectivity

In the prepared test, Objectivity was ensured by including objective type items and the preparation of scoring key.

Practicability

The prepared test is easy to administer as it is in the booklet form. Duration of the test is 90 minutes. Type of items included and preparation of scoring key ensured practicability of the present test.

Conclusion

The constructed test was found to be reliable and valid instrument and it will be consistent in determining teachers' potential, quality and skills. Similar tests may be developed for the teachers of Kindergarten, high school, college and university to evaluate teaching aptitude & study the differences. It is as a consequence suggested that there should be a comprehensive written test for selecting teachers to test their teaching aptitude and attitude towards teaching.

Personnel with high teaching aptitude and attitude if enter into teaching profession will become competent teacher. This process will also help to ensure less misconduct in the teaching profession

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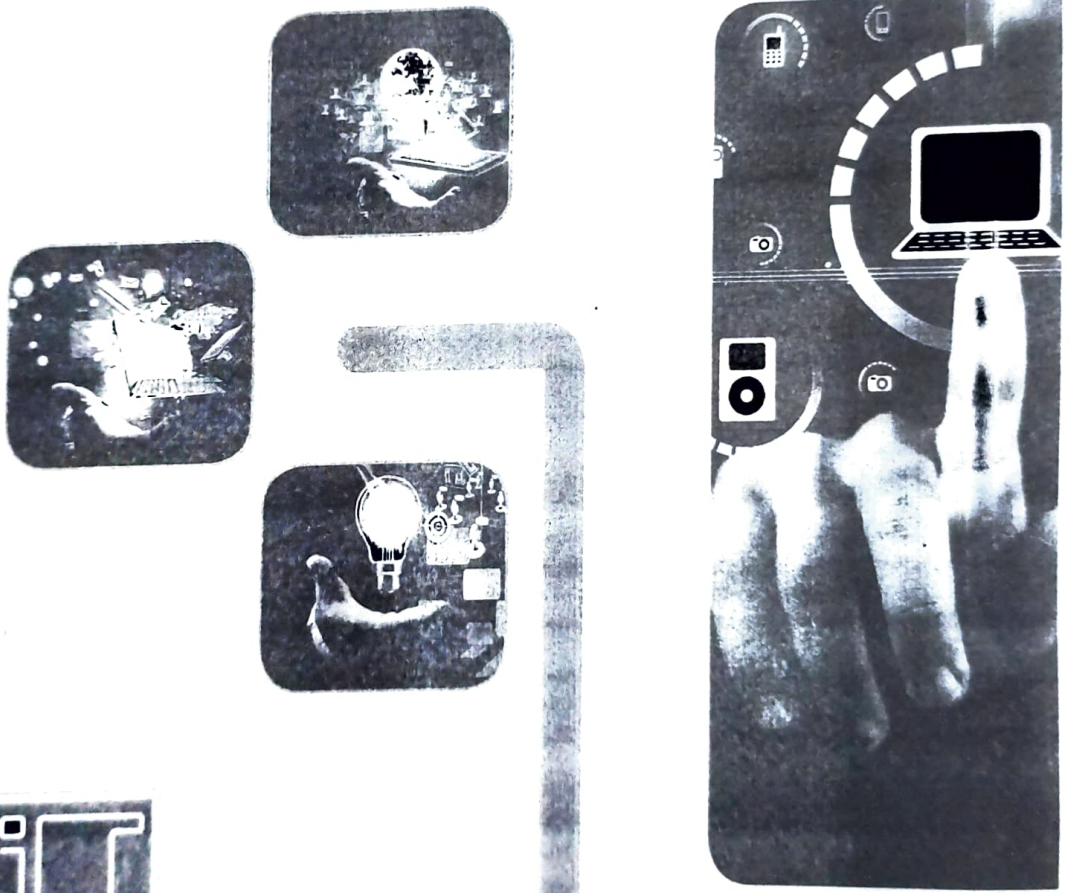
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Revamping The Post-Flood Kerala: An Educational Perspective

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Abstract - Kerala had victimized an incomparable and unparalleled natural calamity during August, 2018, a remarkable and unforgotten year in the history of Kerala. Even in the midst of this agony, Kerala stood as an ideal for others through our unity and strength. During the rescue and relief operations, Keralites displayed a high level of intra-and inter-community trust, helping mentality, mind power, empathy and networking. The fine coordination of the authorities and the ever salutable commitment of fisher folks made the situation acquiescent. The tech-savvy coordinated the rescue works effectively through social media platforms from various parts of the globe, saving thousands of lives and mitigating the suffering of many others. Student fraternity undoubtedly did amazing voluntarily work which highlighted the collaborative unity of young Kerala. The State faced its worst disaster since 1924, and it is now important to rebuild infrastructure and rehabilitate the displaced population. It will be a long road ahead, for the authorities as well as to each individual of the state to restore normalcy.

After the flood relief activities, the major threat faced was the sanitation and flood waste disposal activities. To a great extent, it was also managed through our collective efforts. It has outshined various critical aspects such as the roles and responsibilities of the institutions involved in relief and cleaning, deployment of increased number of volunteers to ensure quick action and the manner in which people should segregate and store flood waste at the household level for collection by local authorities later. Within one month itself, cleaning and allied activities could attain the aim. Now, it's time to move ahead more courageously, more consciously, with more determined mind for an enlightened Kerala which consists of all brightness of sustainable future. The paper discusses certain drop balls in the perspective of education which can act as pillars while revamping the post-flood Kerala.

Keywords - Revamping, Post-flood, Kerala, Educational

Perspective

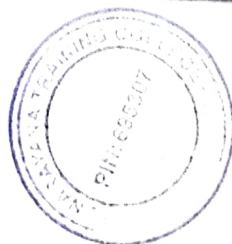
INTRODUCTION

Kerala's achievements in social welfare growth and quality of life are commendable and inspiring. The State's human development index is in tune with that of developed countries in the world. These achievements are attained through continuous hard work, great struggle and excellent supervision in education, economic and other allied sectors for a long time. The society attaches so much importance to education and schools like educational institutions in Kerala have become the key to societal development.

Kerala had victimized an incomparable and unparalleled natural calamity during August, 2018, a remarkable and unforgotten year in the history of Kerala. Even in the midst of this agony, Kerala stood as an ideal for others through our unity and strength. During the rescue and relief operations, Keralites displayed a high level of intra-and inter-community trust, helping mentality, mind power, empathy and networking. The fine coordination of the authorities and the ever salutable commitment of fisher folks made the situation acquiescent.

The tech-savvy coordinated the rescue works effectively through social media platforms from various parts of the globe, saving thousands of lives and mitigating the suffering of many others. Student fraternity undoubtedly did amazing voluntarily work which highlighted the collaborative unity of young Kerala. Even schools and other educational institutes have been affected, as many of them have been converted to relief camps. This has affected students, especially those who are in Class X and XII. This is an important challenge to a state where education is a top priority aspect.

The State faced its worst disaster since 1924, and it is now important to rebuild infrastructure and rehabilitate the displaced population. It will be a long road ahead, for the



authorities as well as to each individual of the state to restore normalcy.

After the flood relief activities, the major threat faced was the sanitation and flood waste disposal activities. To a great extent, it was also managed through our collective efforts. It has outshined various critical aspects such as the roles and responsibilities of the institutions involved in relief and cleaning, deployment of increased number of volunteers to ensure quick action and the manner in which people should segregate and store flood waste at the household level for collection by local authorities later. Within one month itself, cleaning and allied activities could attain the aim. Now, it's time to move ahead more courageously, more consciously, with more determined mind for an enlightened Kerala which consists of all brightness of sustainable future.

Involving each and every people to the rebuilding process of our state will be a better strategy so that they can be more aware of the reality of the situation as well as they all will get a sense of 'we feeling' towards the essentiality. Combined effort with complete involvement will make the process much easier with all avenues of Social capital, Revenue generation, managing perfect time and above all in avoiding future criticisms in terms of unknowingness. Social capital created by reciprocal relationships in society will be vital in 'rebuilding Kerala' because recovery and reconstruction after mega disasters cannot take place through infrastructural or economic endeavour alone. The reconstruction and rebuilding of the state is a long and costly process. It is a greater matter of fact that the people of Kerala have proven that they are stronger than any adversity and there is unity even in the midst of many diversities. It is very important for better planning, policy development, which ensures the futuristic vision taking into account of similar disasters, to increase the dignity and quality of life of every people of Kerala.

The major objective of any reformation or development program is to increase the current status of the beneficiaries in terms of dignity of life, economic and social up gradation. Such a goal can be attained through material, non-material and ethical grounds. One of the most powerful tools for reforming the traditional social structure is education, which provides values, training and skills to persons otherwise held back. In addition, education in a progressive political environment can enhance the self-conceptions of the poorest and most oppressed individuals so that they will participate more fully and consciously in the development process. Kerala stands out among all the states and regions of India for its remarkable achievements in raising the literacy level of its people. We have achieved the 100% literacy status. Hence, in that sense, all our deeds should be as much as ideal that become model to others. It would be grateful, if the points mentioned in the paper would

be useful in the rebuilding process of Kerala. While thinking in an educational perspective, the following points are presented. Let's see one by one.

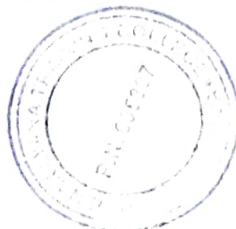
1. Social service should be a compulsory part of curriculum for Education.

Students pick up good values and habits during their studentship days. When they grow up, these values go a long way in moulding them into responsible adults. Even though National Service Scheme (N.S.S.) and National Cadet Corps (N.C.C.) are functioning in Colleges, they are not compulsory to all students. If social work is made mandatory just like other subjects and activities in Institutions, they will learn the importance of living together and giving back to the society. It teaches them to share what they have with others, for the greater good. They learn to be more tolerant. When students step outside of their colleges, they get busy in building a career and making a living. They weigh everything with money. If there is a previous exposure to social community work in their early years of education, chances are they will be more grounded and not be tied down by the materialistic worldly things.

2. Life skills should be a part of Curriculum for all courses

Connection of education and community is fruitfully possible through the application of Life skills. The three pillars of education such as Knowledge, Skills and Values should be attained through the process of education. Our educational scenario is more theoretical. Equal importance should be given to both theory and practice. Through the theoretical aspects, students can gain knowledge, but the skills and values are to be attained only through practical aspects. Improving the skill development of learners in higher education would contribute to placing higher education as the foremost pillar on which our society is built. The academic world has serious doubts on the movement of our society in many respects. We all know that the students going through higher education become the citizens who determine the future of our society. Thus, education has a crucial opportunity to affect the future of our society. Hence it is imperative to include life skill education in the curriculum of all courses so that the 'value' concept be ensured in education.

3. Swimming, driving, diving etc. should be given options even in school education itself. Swimming, driving, diving etc. like the essential skills should be given provision in school education days itself.
4. Documents including textbooks, notebooks and other learning materials etc. to be kept in digital formats even



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by students

Flood experiences show that it would be safe if students also keep their notebooks, text books and all other learning materials in digital formats, especially through digital communication media.

5. Voluntary community-service by teachers

Community service by teachers should also get due recognition. As an acknowledgement, it should be entered into the service book which can be considered as mandatory requirement for promotion by Accreditation agencies like NAAC, UGC, and AICTE etc.

6. Introduction of cloud storages in Education

Cloud storage is growing in popularity due to the benefits it provides, such as simple, lower costs, anywhere access and the removal of maintenance and storage management. It is the delivery of data storage as a service, from a third party provider.

7. Mobile App development for viewing the classes taken by teachers

The educational value of mobile app design and development activities, and the possibility and practicality of teaching/learning mobile app design online, which can further encourage educators to explore and experiment on the potential of incorporating these learning activities in their diverse settings.

8. Disaster Management training

Disasters may happen anywhere at any time. Our Disaster Management Cells to be strengthened at any cost. Disaster awareness as well as Disaster Management Training should be included in education, especially school level onwards, so that our grooming generation will be more sensitized on the manmade environmental issues which indirectly make them prepare to lead a sustainable lifestyle.

9. Community Extension activities for all courses

Extension and outreach programs, we sensitize the students to develop social values, widespread their responsibilities and knowledge in societal issues and problems by making them to involve with the community people.

10. Localization of Education to be promoted

Education should be made more localized. The curriculum, textbooks, etc. should be made suitable to the local

11. Always be ready to face and manage any disasters

As becoming the most densely populated state, Kerala has to be ready at any time to face any disasters. It is not only a factor of Kerala, but the global scenario. The resources are being utilized, getting reduced; man is encountering into the ecosystem and thereby disturbing it. It is the reality that nothing can be done on the resource utilization as because of the population growth. What we have to do is that we should have a clear picture on how the ecosystem is getting losing its naturality, where it affected much and what are the precautions to be taken in order to save the life of people through protecting our earth. Hence we should be ready to face and manage any disasters at any time.

12. Rebuilding should be done with due consideration of environmental issues

The rebuilding and reconstruction processes must consider the future environmental needs also. Integrating ecosystem management and environmental sustainability are inevitable. Experts are of the opinion that the impact of the floods could have been mitigated if prior environmental assessments had not been ignored. The Western Ghats, which have naturally served as a water reservoir for Kerala along with five other States, were the subject of a 2010 environmental protection assessment report, which recommended a ban on mining and quarrying, and limited various economic activities in the Ghats. The report was not implemented and subsequently ignored down, and this excessive stone quarrying and deforestation of sensitive areas may have contributed to the scale of flooding and destruction. Hence an urgent discussion on the matter is crucial which is not only for disaster prevention, but also for human sustainability and existence.

13. Conscientization programmes on Insurance literacy to be done

It is felt necessary to educate youth and adults on the importance of pursuing insurance as a secure step in ensuring financial security to their assets. It is essential to make people aware and recognize the role insurance in protecting wealth and valuable belongings. People should be made aware of their insurance rights even before and after flood, so that they can avail the flood insurance policy like coverages.

14. Construction and Rebuilding should be done in a new format in tune with climatic and environmental conditions of places



Ravi Chander, a Bengaluru-based activist for proper urban planning, said rebuilding efforts should not involve repeating some of the same mistakes. "It is important to respect nature's lines. Do not build along the valleys, contours and the low points. We should also learn not to repeat our mistakes and build houses in the same area where they have been affected, because they interfere with nature's path."

15. Sustainable development should be planned and implemented

To establish an environment that fosters sustainable development, it is imperative to include flood management strategies in the development processes. Capacity building activities are to be planned and implemented.

16. Village Disaster Management Plan to be done-before, During and After the disaster

The village level activities of risk and disaster management to be well planned and strengthened at any cost and should be equipped in all means for a better management before, during and after any disaster.

17. There should be well coordinated communication among different sectors of government for the successful implementation of the plan.

It is seen that various government departments are functioning as watertight compartments. There is no communication and coordination among the departments which ultimately results in heavy workload or no work progress to the society. Correct information is not being transmitted to people. To avoid misconceptions and get clarity of information, there should have well coordination among the departments.

18. Rehabilitation Centers should not be the Schools

Rehabilitation centers should not be in a school or educational institutions since students are missing their golden time for education even though they are not the direct victims. Whenever a disaster happens or any other public occasion like Election and all, we always point out

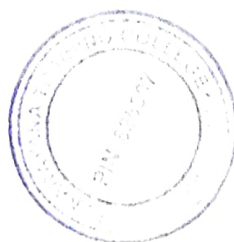
educational institutions as the centers of work. If one or two days or at least for one week, it would be considerable. But, more than that, as policy implementers, we do total injustice to the students as they miss a lot unknowingly. Time once lost means, lost forever. Even though, the lessons and portions will be cleared afterwards, it cannot do justice to students. Students may enjoy the holidays. But, as responsible elders, it's our duty to protect their rights. Hence government should take initiative to start permanent rehabilitation centers which some other states possess.

CONCLUSION

The responsibility of reconstructing and rebuilding an achieved and progressed State through commitment and hard work is not an easy task. It is a huge responsibility upon the government. As sensible citizens of the state, we all can share the task with sincerity and futuristic vision. Kerala has achieved great positions, especially in educational field. The characteristics of an educated society should be revealed and reflected upon our actions. Thus let our actions become intellectually mature, socially committed, spiritually inspired, culturally awakened and innovative in all means for the fulfillment of the dreams of around four crores of people of our Kerala. Let it be a role model to others so that they can follow our unity of strength and ideas. This holds equally true for rebuilding Kerala with the additional goal of people-centric adaptation.

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Editorial

The rapid changes and increased complexity of today's world present new challenges and put new demands on our education system. There has been generally a growing awareness of the necessity to change and improve the preparation of students for productive functioning in the continually changing and highly demanding environment. In confronting this challenge it is necessary to consider the complexity of the education system itself and the multitude of problems that must be addressed. Clearly, no simple, single uniform approach can be applied with the expectation that significant improvements of the system will occur.

Among the most difficult problems faced by the education system are those associated with teaching effectiveness? The current preparation of teachers for specific age levels, specific subject matter, specific academic skills, etc., does not take into consideration sufficiently the complexity of factors such as students' various characteristics. There is a strong need to train teachers to adapt instruction to the diverse student abilities, learning styles, personality traits and needs by using more differentiated teaching strategies. A teacher needs to be able to formulate, construct, arrange, modify and make sense of information so that it understood as knowledge.

It's tempting to say that no matter how much technology pushes on education, every teacher will always need to know iconic teacher practices like assessment, curriculum design, classroom management, and cognitive coaching. This may end up being true—how education changes in the next 20 years is a choice rather than the inevitable tidal wave of social and technological change it's easy to sit back and wait for. Think of the very limited change in education since 2000 compared to the automotive industry, computer industry, retail consumer industry, etc. Huge leaps forward are not a foregone conclusion.

As we are all aware the 21st century learner is a self directed learner, globally aware, a communicator, an innovator, a problem solver, a collaborator, information and media literate and a critical thinker. That is a lot that the learner of today needs to achieve. To create such learners our teachers must go above and beyond the basics of knowledge sharing to embracing the 4 C's—communication, Collaboration, Critical Thinking and Creativity, the 'Super Skills' for the 21st Century!

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Reflective Teaching: A Challenge to Teacher Education

Dr. Sheeba. P

Abstract

Teacher educators should apply reflective practice in classroom in order to observe and reflect on the results so that the classroom becomes a kind of laboratory where the teacher can relate teaching theory to teaching practice. By adopting reflective teaching teacher educator imparts inspiration among teacher trainees, so as to enable them to practice the same in their teaching practice sessions. The present paper focuses on the importance of reflective teaching that should be practised in teacher education to sustain quality in teaching among teacher trainees. The effect of reflective teaching was experimented on a group of 80 student teachers in Sree Narayana Training College Nedunganda. The teacher trainees were trained to adopt the reflective teaching during their practice teaching period. The result was found to be favourable as it reflected on better Quality of Instructional Performance of the students who practised reflective teaching during their practice teaching.

Key words: reflective teaching, practice teaching, teacher education

Introduction

Teachers are the greatest assets of any education system. They stand in the interface of the transmission of knowledge, skills and values. Teacher education plays a vital role in reforming and strengthening the education system of any country. Training of teachers has emerging global trends in education and the overall needs and aspirations of the people. The Quality of education depends on the quality

teachers and teaching. The way teachers are trained is an important aspect to improve quality. Hence the teachers should apply reflective teaching in their classrooms so that the classroom becomes a kind of laboratory where the teacher can relate teaching theory to teaching practice. By adopting reflective teaching, teacher educator imparts inspiration among teacher trainees, so as to enable them to practice the same in their teaching practice sessions.

Reflective teaching means looking at what you do in the classroom, thinking about why you do it, and thinking about if it works - a process of self-observation and self-evaluation. By collecting information about what goes on in our classroom, and by analyzing and evaluating this information, we identify and explore our own practices and underlying beliefs. This may then lead to changes and improvements in our teaching.. As individuals possess their own background and experience, bring certain beliefs, assumptions, knowledge, attitudes and values to teaching.

It is also seen that teaching takes place in a social setting that has its own unique characteristics, opportunities and constraints. The practice of Reflective teaching explores the implications of all these complex factors with the intention of understanding and improving teaching -learning practice. Schon (1993) suggested that reflective teaching practice is a continuous process and involves learner thoughtfully considering one's own experience in applying knowledge to practice while being taught by professionals. It helps the individual's to develop their own personality.

Reflective practice is used both in pre-service and in-service levels of teaching. Coaching and peer involvement are two aspects of reflective practice seen most often at the pre-service level. In 1993 a study on how student teachers develop the skills necessary for reflective teaching during their field experiences, Ojanen explores the role of the teacher educator as coach. Teacher educators can most effectively coach student teachers in reflective practice by using students' personal histories, dialogue journals, and small and large-group discussions about their experiences to help students reflect upon and improve their practices. Sellars (1996) analyzed the students' reflective writings and

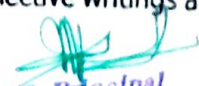
interviewed them extensively about their reflective practices. They found that the student teachers by practicing reflective teaching enables them to challenge existing theories and their own preconceived views of teaching resulting in professional development that would be useful throughout their teaching careers. Several research studies have proved that critical reflection upon experience continues to be an effective technique for professional development. Freidus (1997) describes a case study of one teacher/graduate student struggling to make sense of her beliefs and practices about what constitutes good teaching. Her initial pedagogy for teaching was based on the traditions and practices of direct teaching. Her traditional socialization into teaching made it difficult for her to understand that her views of good teaching were being challenged in her practice. After implementing reflective teaching technique in her classroom enabled her to acknowledge and validate what she was learning. The present paper work highlights the importance of practicing reflective teaching pedagogy by teacher trainees during practice teaching, so that they develop competitive attitude.

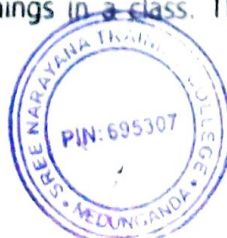
Some Strategies Used for Reflective Teaching

Self/Peer observation - Teachers were motivated to self assess in order to identify the problems themselves. Then peers and sometimes superiors also sat in their classes but only with the prior knowledge of these teachers. The observations and reflections of all three categories of teachers were pooled in and remedies were given with regard to language use, knowledge enhancement and class control.

Teacher Diary - After each lesson, the teachers recorded in a notebook all the happenings in a class. They were made to

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describe their own actions and reactions during the class as well as those they observed on the part of the students. This helped them to identify how certain lessons were very successful and certain others were not and also when, where and why student behaviour was good or bad.

Brain storming and Group Discussion -
This part of the research took place in the staff room where all faculty brain stormed and had group discussions on problems faced by each teacher with regard to the syllabus, students' response, attitude and errant behaviour, and tips to motivate and enhance student interaction in class.

Student feedback - Feedback provided by students also formed a basis for the senior teachers to counsel and advice these teachers. The opinions and perceptions of students added a different and valuable perspective to realize what students expect from language teachers.

Objectives of the study

1. To find the level of reflective practicing strategies undertaken by the teacher trainees during their practice teaching
2. To identify the most frequently used strategy for reflective teaching by the student teachers during their practice teaching.
3. To find the relation between Reflective teaching practice and the quality of Instructional Performance of the students.

Methodology

As it is evident that reflective teaching is an effective method of practice teaching by the teacher trainees to develop self inquiry urge in them resulting in reflection of the same attitude among learners. The strategies selected for reflective practice are self/Peer observation, Teacher Diary/reflective Diary; Brain storming and Group Discussion and Student feedback.

The sample, the 80 student teachers was given training in the reflective teaching methodology using the said strategies during their pre-practice teaching training period. They were made to practice these strategies during their practice teaching in different schools.

A repeated practice of the method enables the teacher trainees to develop professional training in applying reflective practice in teaching- learning process. A tool consisting of 20 statements evaluating the implementation of reflective practice strategies by the student teachers during practice teaching period was given. The teacher trainees were asked to tick the truthful option based on the five point scale. The reflective practice teaching of the individual student teacher is the total score obtained for the 20 statements. After completing the 20 statements, they were asked to rate the different strategies they have used for reflective practice during the practice teaching period. The quality of instructional performance of each teacher trainee was obtained from the score given by the teacher educator when evaluating the classes during the practice teaching with the evaluation proforma published by University of Kerala.

The scores thus obtained are subjected to statistical analysis.

Sample

The present study was conducted by choosing 80 teacher trainees enrolled for bachelor of Education degree in Sree Narayana Training College Nedunganda. during the academic period 2016-18

Tools used for the study

In the present study the investigator used the tool Reflective teaching Scale for evaluating the implementation of reflective practice strategies by the student teachers during practice teaching period. The tool consisted



of two sections - the first section with 20 statements which was used to collect the data regarding the practice of reflective learning strategies and the second section gives details of most frequently strategy used by the student teacher to implement the reflective learning practice during their practice teaching.

Secondly for evaluating the quality of instructional Performance of the teacher trainees the investigator used the rating scale prepared by the University of Kerala for evaluating the practice teaching sessions

Statistical Techniques Used

For the present study the investigator used mean, standard deviation, percentages and Carl Pearson's Product Moment Coefficient of Correlation.

Analysis and Interpretations

After collecting the data the investigator analysed it and the details of analysis are given in the following pages.

1. level of reflective practice undertaken by the teacher trainees during their practice teaching

The arithmetic mean and standard deviations were computed for the total group and for different sub-groups. The values obtained for the arithmetic mean and standard deviation for the whole group and subgroups were shown below:

Table 1
Mean and standard deviation of the reflective practice undertaken

sl.no	group	N	mean	standard deviation	M-ó	M+ó
1	whole group	80	54.7	4.6	59.3	50.1
2	science group	37	56	4.8	60.8	51.2
3	non science group	43	55	4.3	59.3	50.7

M-ó and M+ó were used for classifying the students with respect their level of reflective practices undertaken during practice teaching as below average, average and above average. That is, the number of student teachers whose score below is 50.1 is treated student teachers with below average reflective practice and who got score more than 59.3 as student teachers with above average reflective practice and the students teachers whose scores between 59.3 and 50.1 are considered as student teachers with average reflective practice. The number of students belongs to each of these three categories is given in the following table.

Table 2
Number and percentage of students in different levels of Quality of

	No. of Student teachers	Teaching efficiency due to reflections		
		Below average	average	Above Average
Whole group	80	10(12.5%)	25(31.25%)	45(56.25%)
Science	37	2(5.4%)	10(27.02%)	25(67.6%)
Non-science	43	3(6.97%)	14(32.55%)	26(60.46%)

The above table shows that out of the 80 student teachers, 56.25% (45 student teachers,) of student teachers are practicing above average level of reflective practice and 31.25% (25 student teachers) student teachers are with average level of reflective practice and only 12.5% (10 student teachers) student teachers have below average level of reflective practice. For science group student teachers 67.6% are having above average level of reflective practice and 35.1% and 8.1% students are respectively in the average and below average level of reflective practice. For non-science group, 6.97%, 32.55% and 6.97% student teachers are respectively having the above average, average and below average level of reflective practicing.

2. The most frequently used method for reflective teaching by the student teachers during their practice teaching.

Table: 1

Table showing student teachers' preferences on the strategy for implementing reflective practice during practice teaching

Sl.No.		First Preference in%	Second preference in%
1	Self evaluation	28	16
2	Peer observation	30.	11
3	Teacher Diary	25	15
4	Brain storming	18	22
5	Reflective journal	63	18
6	Student feedback	6	14

From the collected data it is clear that 63% of the student teachers teaching in high school classes use reflective journal as the most frequently used strategy for practising reflective practice in their class rooms. That is, majority of student teachers are using reflective journal as the first preference among the various strategies. Through reflective journal they reflect each and every activity inside and outside the classroom. Peer observation has the second preference (30%) and self evaluation got the third preference (28) and so on and student feedback has the least preference (6%) in implementing reflective practice during their practice teaching period.

The relation between Reflective Practice Teaching and the Quality of Instructional Performance among the Student Teachers.

The investigator, being a teacher educator evaluated the Quality of Instructional Performance of student teachers by direct observation of the classes of student teachers using the "practice teaching-observation schedule and obtained the scores of Quality of Instructional Performance due to teacher evaluation of student teachers. The scores of the Quality of Instructional Performance by the teacher Educator and reflection of student teachers were used for calculating Carl Pearson's coefficient of correlation coefficient. The details are given in the following table:



Table 3

Relation between the reflection and teacher evaluation of teaching efficiency of student teachers

Variable	N	Pearson's r	Fisher's t
Reflective practice of student teachers	80	0.634**	12.16
Quality of Instructional Performance of student teachers			

** represents significance at 0.01 level

The coefficient of correlation between the reflective teaching practice of student teachers and their Quality of Instructional Performance is 0.634 which shows that there exists a positive substantial relationship between the two variables. The Fisher's t-value (12.16) shows that the relationship is highly significant, as the value exceeds the limit (2.58) set for significant at 0.01 level of significance. Hence it can be concluded that there exists a significant positive correlation between the Reflective practice among student teachers and their Quality of Instructional Performance.

Conclusion

The student teachers at secondary teacher training level possess good quality of Instructional Performance through reflecting their lessons. That is, we can say there is a positive and significant relation between reflective teaching and quality of Instructional Performance among secondary school student teachers. The teacher, the national integrator is the backbone of the society. With the passage of time, the preparation of teachers and the expectations of the society have changed. The student-teachers should possess the qualities of teaching and positive perception towards the training course. From the study we can conclude that student teachers who are

practising reflective teaching leads them towards professional development. In view of this, it would recommend that efforts should be taken by the teachers for reflective practice and thereby improving and maintain their quality instruction. The finding is supported by the evidence from earlier studies by Canning (1991) explained that reflection is an interpersonal experience leading to insight about individuals as actors in their own worlds. Clarke & Croft, (1998) suggested that reflective practice has the broad meaning of being able to look at our own professional behaviour and practice with the intention of improving and developing. Hence, this development and improvement involve different areas in our profession, such as our knowledge, skills, attitudes and awareness, through reflective teaching.

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Extent of Awareness of Ethical Principles for Women Empowerment among Pre-service Teachers

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Abstract

The concept of empowering women requires so much analysis and evaluation in the contemporary period. The status of women is low when compared to men. It is a popular belief that women are inferior to men. It is a fact that mostly women are under the control of men. Women are seen as objects or property or even as instruments to be used as they desire. Women often do heavy jobs with low status and have become one of the disadvantaged groups in society. Plato in his Republic highlights the equal responsibility of men and women and proposed that both of them have same responsibilities and should perform the same tasks. We strongly hold that society is patriarchal and that women should be subordinated to men.

Empowering of women pre-supposes a drastic dynamic and democratic change in the perception of and expectation from women in our society. To help women to attain economic independence is the first priority for such a change. Thus women empowerment is empowering the women to take up their own decision for improving their social, economic, political and legal strength. It should ensure sense of self-esteem and dignities so that they can exercise equal right in social, religious and public activities. When a woman attains economic independence she naturally becomes the mistress of her own body and author of her own decisions. A scientific perception of women's needs is essential for the process which leads to the empowering.

The present paper throws light on the extent of awareness of ethical principles for women empowerment among Pre-Service Teachers. The central aim of this paper is to highlight the major features of ethical principles and applications of this for improving the overall development of women in all areas of life.

Key Words: - Ethical Principles, Women Empowerment, Pre-service Teachers

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Key Words: - Ethical Principles, Women Empowerment, Pre-service Teachers

Introduction

"Yatra Naryastupujante, Rmante Tetra Deva"

It means the God resides in those places where women are worshipped. In India during the Vedic period women occupied a very important place which was not less than that of men, but during the middle period the status of women suffered severe setbacks. That time of India history relegated the status of women to such an extent that it resulted in restricted liberties and educational backwardness to them. The trend continued during the British rule, with the exception of certain reformers like Ishwar Chandra vidhya sagar, Mahatma Gandhi, Raja Ram Mohan Roy who tried to restore the position of women in society. To understand the Indian scenario, history tells that there were distinct states of rise and fall in the status of women. The present paper throws light on the extent of awareness of ethical principles for women empowerment among Pre-Service Teachers. The central aim of this paper is to highlight the major features of ethical principles and applications of this for improving the overall development of women in all areas of life.

Ethics

Ethics is the science of customs or habits of men. Ethics may be broadly defined as the science of morality or as the study of right conduct or duty. It evaluates the voluntary actions and habitual actions of persons and considers their rightness and wrongness of conduct. In education ethics is to decide what implies and disposition in children should embrace all departments of human action exert and elevating influence upon them, and raise humanity to a higher level. Moral insight into duties makes a better and possible

performance in all areas of human interactions. Ethics indirectly exerts a paramount influence on all departments of our practical life. The right solution of the vital problems of religion, politics, economics, legislature, education, equality etc. depends upon the correct notions of right and wrong. "If an action is right in a particular situation, we ought to do it, i. e., it is our duty to do it.

Women Empowerment

The empowerment is the process which enables one to gain power authority and influence over others institutions or society. The concept of empowering women requires so much analysis and evaluation in the contemporary period. The status of women is low when compared to men. It is a popular belief that women are inferior to men. It is a fact that mostly women are under the control of men. Women are seen as objects or property or even as instruments to be used as they desire. Women often do heavy jobs with low status and have become one of the disadvantaged groups in society. Women are often exposed to indiscrimination with reference to selection or employment of jobs in typical informal sectors. These often lead to poor working conditions, lesser pay and generally subjected to all kinds of exploitation. All these factors have major implications for women's general health condition, overall well-being, economic and physical security, and specifically the welfare of children.

Need and Significance of the study

Empowering of women is a necessary sustainable development of a community. Women play variety of significant roles in our society from their birth till the end of life. Even after playing her all the roles and all the job timely in efficient manner in the modern society,

she is weak because men are still strongest gender of the society. They are being ill-treated for many years and used just as things to fulfill the wishes of men. Considering them as goddess is not enough to give them full women empowerment in the society; however it needs positive continuous effort and participation of both men and women to really bring women empowerment. wife, mother, mother-in-law, grandmother, etc. By following such a big responsibility in the family, they are fully able to come out and do job for bright future of own, family and country. Women are considered as the goddess in the Indian society from the ancient time however it is also true that they are not treated as goddess. They are being ill-treated for many years and used just as things to fulfill the wishes of men. Considering them as goddess is not enough to give them full women empowerment in the society; however it needs positive continuous effort and participation of both men and women to really bring women empowerment.

Being teachers, it is the responsibility of teachers and education that the concept of women empowerment is to be strengthened in the society. The role of education is to mold socially responsible desirable citizens. It is the need of the hour that women are to be strengthened and empowered from discrimination on the basis of gender. Student teachers are to be made aware of the need for women empowerment and the ethical principles for empowering women.

Objectives of the Study

The central objective of this study is to understand the extent of awareness of ethical principles and its application for improving the overall development of women in all areas of life by the student teachers

Hypotheses of the Study

The following hypotheses were formulated by the investigator to lead the study

Student teachers are aware on the ethical principles and its application for improving the overall development of women in all areas of life by the student teachers.

Methodology

Population and profile of the sample

In this paper the researcher made an attempt to understand the extent of ethical principles and its application for improving the overall development of women in all areas of life by the student teachers

The sample selected were 100 student-teachers from six different optional subjects of Sree Narayana training College, Nedunganda. The samples were selected using random sampling technique.

Instruments, participants and procedure
A twenty four item questionnaire was prepared based on the ethical principles Autonomy, Benevolence, Non-maleficence, Justice and Truthfulness. Each item follows with options of Yes or No. The questionnaire prepared was distributed among 100 students and their responses were collected back. Appropriate statistical technique like Percentage Analysis was used for assessment and interpretation.

Data Analysis

Sl. No	Items	Yes	No
1	'Any development strategy neglects the need for enhancing the role of women cannot lead to comprehensive socio- economic development'. Do you agree with this?	96%	4%
2	Do you think that for the development of women, need some values and morals within herself?	92%	8%

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3	Women need equal environment opportunity and education without gender bias. Do you agree?	96%	4%
4	Do you share your feelings with your mother?	100%	0%
5	Do you help your mother at kitchen?	87%	13%
6	Women play variety of significant roles in our society from their birth till the end of life. Do you agree?	100%	0%
7	Education plays an important role in the foundation of girls development towards adult life. Do you agree?	100%	0%
8	Reproductive health care is fundamental to women's well-being. Government must take affirmative measures to ensure it. Do you agree?	96%	4%
9	Do you think that women also have the right for family planning?	100%	0%
10	The most inspiring person behind your life is your mother, or a women. Do you agree?	58%	42%
11	Do you think the most pertinent problem faced by women is basically related to lack of education and unemployment?	83%	27%
12	Do you support the dowry system in marriages?	4%	96%
13	Do you agree with the view that the sons of the family earn money for his parents in their lifetime, while the girls will get married one day and go away?	0%	100%
14	The instances of large number of reported crimes against women are positive sign of women speaking up and the police records their complaints. Do you agree?	90%	10%
15	Do you think that a women must be a subject in her own life and for the world, not an object?	92%	8%
16	Do you think that women empowerment is needed for the development of women?	100%	0%
17	Do you agree that women need some inherent morals and ethical principles?	79%	21%
18	Liberty is the first condition for growth. So women need a proper environment to develop her- own abilities. Do you agree?	84%	16%
19	Women empowerment does not mean the development of the women alone but the whole society. Do you agree?	76%	24%
20	Do you agree that women need an equal status and justice with everybody?	99%	1%
21	Have you ever helped a woman from a critical situation?	72%	28%
22	Do you have any dissatisfied situation in your life?	60%	40%
23	In Indian philosophy women is considered as a mother or the primary subject to respect. Do you agree?	96%	4%
24	Can you take a pledge that "I will not hurt any women and it is my duty to help her in a critical and dangerous situation"?	100%	0%

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92% of the total sample believe that development of women; need some values and morals within her. According to 96%, Women need equal environment opportunity and education without gender bias and not only that Women empowerment does not mean the development of the women alone but the whole society (76%). Liberty is the first condition for growth. So women need a proper environment to develop her- own abilities (84%). The instances of large number of reported crimes against women are positive sign of women speaking up and the police record their complaints (90%). Out of the 100 participants, 99 of them think that women need an equal status and justice with everybody.

Findings

- Development of women, need some values and morals within herself
- Women play variety of significant roles in our society from their birth till the end of life
- Education plays an important role in the foundation of girls development towards adult life
- Reproductive health care is fundamental to women's well-being
- Most pertinent problem faced by women is basically related to lack of education and unemployment
- The instances of large number of reported crimes against women are positive sign of women speaking up
- Women empowerment does not mean the development of the women alone but the whole society.

The study results reveal that eventhough the participants were aware on the need for empowerment, Government must take affirmative measures to ensure it.

Conclusion

In terms of government policies on women's education, it was observed that while there is no explicit discrimination by gender in most places, neither is there a real commitment

to provide sustainable programmes for women. There is such a perceived gap between the rhetoric and policies of decision-makers that many of the women considered the policies as simply paying "lip service" to women's concerns. Even in developed countries, the proportion of resources that is being allocated to women's needs is small considering the many diverse needs of the women.

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PERCEPTION OF VALUE ORIENTED PROGRAMMES AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

Value oriented education is an extension of value education aimed at the development of proper attitudes, values, beliefs and principles of students of the economy. So value oriented programmes are organising in schools to help students among them to know the value. This study was aimed to find out the level of perception of value oriented programmes by the secondary school students who are implemented in secondary schools and to find out if any differences in the perception of value oriented programmes by the secondary school students with reference to gender, age and type of schools. 322 samples were selected from a population of VIII, IX and X secondary school students of Attingal Educational District. The investigator used a rating scale on Perception of Value Oriented Programme among secondary school students. Analysis of the survey data was done by percentage analysis, ANOVA and t-tests. The results showed that the level of perception of value oriented programmes by the secondary school students is low. Female students showed higher perception in their perception of value oriented programmes than that of male students. Students in age group of 14 and 15 showed higher value perception of value oriented programmes than that of 12 year old students. Government school students showed greater perception of value oriented programmes than that of a day and private school students and it may be due to the transmission or modelling of good values from teachers to students because of the friendly relationship. Also Government is paying interest in the well functioning of the schools and for the betterment of the students in all respects.

Keywords: Perception, values, Value Oriented Education, National Reconstruction, Abstract Value

INTRODUCTION

A value signifies that quality of an individual or things which makes an individual or things important, respectable and self. But from philosophical and educational point of view, values signify neither a thing nor an individual, but a thought or a point of view. As such, anything which is useful to an individual becomes valuable to them. From this view, values refer to objects that we cherish or desires and worthy of acquisition. These may be material objects like food, clothing, shelter etc. and abstract qualities like truth, beauty, goodness, peace, happiness etc. These values have immense worth for human beings. "In case of human beings, the values differ from society to society. What is regarded by one social group as good may be bad in the

eyes of the others. Yet there are certain moral qualities or abstract values viz. honesty, kindness, benevolence, generosity, truthfulness, goodwill etc. which are regarded good by almost all the human societies still there may be differences in this respect as well" (Sharma, 2006).

Values are firmly ingrained in Indian philosophy and culture. The Vedas and Upanishads speak widely on values. Value based education imparts social, moral, integrity, character, spirituality and more. It builds the qualities of humility, strength and honesty in a person. People with high ethical values will never cheat others. These gems make their life happier and work hard to make others happy too.

Education at schools today has reduced to a bread and butter formula. A profit minded educational institution can



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2014-15 due to the fact that government is imparting value oriented education to the students through various means.

Implications of the Study

To the Teachers

- Provide periodical lecturing on current deterioration of values among secondary students by quoting incidents and should give suggestions to improve
- Subject teachers by interdisciplinary approach should convey the importance of values in educational field
- Teachers must be given special charge to convey value oriented programmes to students in secondary level

To the Government Authorities

- Department of Human Resource Development should support value oriented programmes among secondary schools
- Curriculum should be reformulated in such a way to provide value-oriented education among secondary students

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Strengthening Critical Thinking Skills of Prospective Teachers Through Applications Of Vedic Mathematics

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Introduction

Good teachers form the foundation of good schools, and improving teachers' skills and knowledge is one of the most important investments of time and money that local, state, and national leaders make in education. Our changing goals for learning, coupled with shifts in curriculum emphasis and a deeper understanding of teacher learning and student thinking, have led to new findings about the impact of teacher professional development and how best to sharpen teachers' skills and knowledge. Teachers are expected to teach as per the curriculum, take care of all round development of children, develop abilities such as learning how to learn, problem solving, creative thinking, which are crucial for living effectively in the world rapidly changing with the developments in science and technology. A person who does not possess the skills and competencies required for the tasks expected of the teacher cannot be called a teacher. What matters most is what teachers learn. Professional development should improve teachers' knowledge of the subject matter that they are teaching, and it should enhance their understanding of student thinking in that subject matter.

Responsibility of Teacher Education Institutions

The growth of teacher education institutions in the country has shown mathematical trend-producing graduates who are finding it difficult to find employment. This resulted in a drastic down gradation of the standards in our education system and a high rate of rejection of their products. This is the result why we have such a huge number of qualified teachers un/under employed. We have to ensure quality and accountability in the perspective teachers who are the future social engineers. Unless quality is brought into our education sector, it is going to suffer a major setback in the present race of competition. The new breed of teachers should have all the competencies expected of them for performing the exacting educational tasks of the 21st century. We have to create a system of teacher education which can compete with the best anywhere in the world. Delor's report - 'Learning: The treasure Within' has rightly emphasized on four pillars of education for the 21st century namely learning to know, learning to do, learning to be and learning to live together. Thus the professional preparation of teachers by ultimately ensuring quality and accountability is the need of the hour.

Competencies For 21ST Century

According to Benjamin .S. Bloom (1956) learning is the basis of development in the three imaginative domains of an individual viz: cognitive, affective and psychomotor domain. Traditional and modern classroom learning focus on enhancement of knowledge through preliminary concepts that fall under the cognitive domain as described by Bloom. Should we still focusing on these three domains? Definitely not. Apart from developing basic skills, nowadays twenty first century skills are to be inculcated among learners. Hence it is essential to stress the need for the prospective teachers to 'leave the institution

with a deeper understanding of their subjects and with the skills needed to respond to an unbounded but uncertain 21st century – skills to use their knowledge, to think critically, to collaborate, to communicate, to solve problems, to create and to continue to learn’. Prepare them for critical thinking is the major concern. Critical thinking is a process that challenges an individual to use reflective, reasonable, rational thinking to gather, interpret and evaluate information in order to derive a judgment.

Table 1: Twenty First Century Skills

Learning and Innovation Skill	Digital Literacy Skill	Carrier and Life Skill
Critical Thinking and Problem Solving	Information Literacy	Flexibility and Adaptability
Creativity and innovation	Media Literacy	Initiative and Self Direction
Collaboration	ICT Literacy	Social and Cross Cultural Interaction
		Leadership and Responsibility
		Productivity and Accountability

(Source:<http://www.p21.org/overview> retrieved on 23/01/2014)

Increasingly, the onus is on Teacher Education Institutions (TEI) to ‘rethink’ how they can most effectively prepare future teachers to teach these skills for success in a complex, rapidly changing world.

Vedic Mathematics, A Suitable Solution For Enhancing Critical Thinking

Vedic Mathematics offers an approach to resolving the current crisis in education (Puri & Weinless, 1988; Puri, 1988). It is not simply a collection of new computational techniques; rather, it provides an entirely different approach to mathematical computation, based on pattern recognition (Puri, 1991). It has since been shown that the system is equally applicable to more up-to-date aspects of mathematics both at an elementary level as well as in more sophisticated fields (Nicholas, Williams, & Pickles, 1984). The reason that this is possible relies on the nature of the sutras. They frequently describe how the mind approaches, or deals with, a problem in the earliest way (Puri & Weinless, 1988). The Vedic system teaches this sort of approach systematically rather than leaving it to chance and hence we find a number of different possible methods for any particular sum. This is of tremendous use because it enhances variety of strategy. It also enables the subject to be kept alive by directing the attention towards underlying pattern and relationship (Stoddard, 1962; Starkey & Gelman, 1982). It is a system with mental multi choice procedures, which keep the mind alert and agile. It is a complete and most natural Vedic System, which develops our brain to wonderful levels, stimulates critical thinking (Reyes, 1984). Puri points out that the naturalness and ease of Vedic Sutra based computation “brings smiles on the face and joy in the heart” of the students which bring mental strength and confidence (Puri, 1986). Further, Vedic Mathematics reduces anxiety and increases playfulness.

This spark tempted the investigator to apply Vedic computational strategies in improving computational speed and critical thinking ability of prospective teachers and thereby empower them to be skillful enough in order to meet the situational challenges of their career and life.

Objectives of The Study

The study was conducted among members of prospective teachers. The present study was undertaken with the following objectives:



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1. To test the effectiveness of the Supreme power of Vedic Mathematics in strengthening Computational Speed and Critical Thinking Ability of prospective teachers
2. To equip the prospective teachers with self-confidence by attaining skills of Computational Speed and Critical Thinking Ability through Indian intellectual tradition of Vedic Mathematics

Hypotheses of The Study

The following **hypotheses** were formulated by the investigator to lead the study

1. Vedic Mathematics applications are very much effective in strengthening Computational Speed and Critical Thinking Ability of prospective teachers.
2. Acquisition of the skills of Vedic Mathematics applications is a true solution in equipping prospective teachers with adequate skills.

Methodology

Population and Profile of The Sample

In this paper the researcher made an attempt to strengthen the Computational Speed and Critical Thinking Ability of prospective teachers. The sample selected were 100 B.Ed.students from various disciplines of Sree Narayana Training College, Nedunganda of Thiruvananthapuram District of Kerala State, India. The samples were selected using random sampling technique. Study was undertaken for a period of one week.

Instrumentation

The tools used for the study were

1. Modules prepared on Vedic mathematics ‘Ekadhikena Purvena’, Ekanyunena Purvena, ‘Nikhilamnavatascharam Dasatah’ and, ‘‘Urdhva Tiryagbhyam’’ Sutras.
2. Computational Speed Test (developed and standardized by the investigator) and Critical Thinking Ability Test (Excerpted from: From Critical Thinking Skills Success In 20 Minutes a Day. 2010 by Learning Express, LLC).

Design, participants and procedure

The Research Team intended to test the effectiveness of the prepared Modules on Vedic Mathematics. Thus an experimental study was designed. Hence selected the Non-equivalent Pre test-Post test Control Group Design (Gay, 1987) which is one of the strongest of the Quasi Experimental Designs. It was decided to conduct the experiment in the casual classroom groups and to equate the group statistically by applying the technique of analysis of covariance. Experimental and Control Groups were divided with 50 trainees in each group. Both groups shared the same Team Member as the mathematics teacher. Before the intervention, a pre-test was conducted among the sample. The Control group was given the existing instructional system of Mathematics and the Experimental Group, Vedic Mathematics instructional system. At the end, Post-Test was administered and the scores were collected. After an interval of 1 month, a retention test was given without any notice. The same tools were used for administering the retention test. Analysis of Co –Variance was applied (ANCOVA) to compare Pre Test-Post Test Scores.

Data Analysis

Table 2.

Mean values and Standard Deviations of computational speed scores in pre, post tests of prospective teachers in experimental and control groups

Group	N	Mean	SD
Pre Experimental	50	19.65	2.88
Post Experimental	50	9.13	0.87
Pre Control	50	19.13	2.47
Post Control	50	16.16	2.68



Table 3.

Summary of ANCOVA of Computational Speed scores in Post & Retention Tests of prospective teachers in the experimental and control groups

Test	Source	Sum of Squares	df	Mean Squares	F-ratio
Post test	Pre Speed	254.90	1	254.90	41.53**
	Between Groups	2437.44	1	2437.44	397.14**
	Within Groups	1454.57	97	6.14	
	Corrected Total	3917.73	99		
Retention Test	Rt Rt Speed	129.22	1	129.22	17.83**
	Between Groups	1474.75	1	1474.75	203.53**
	Within Groups	1717.29	97	7.25	
	Corrected Total	3200.25	99		

**significant at 0.01 level

In the post test, the obtained F-ratio for the Between Groups is 397.14 ($F_{(1, 97)} = 397.14, p < 0.01$). This indicates that the mean difference between experimental and control group is statistically significant.

Table 4

Comparison of pre-test score and post- test score of Critical Thinking Ability and Computational Speed of prospective teachers in experimental group

Particulars	Pair	Mean	SD	Mean Difference	t-value
Critical Thinking Ability	Pre Score	18.03	2.213	8.12	17.000*
	Post Score	26.15	1.703		
Computational Speed	Pre Score	19.65	2.88	10.52	18.008*
	Post Score	9.13	0.87		

* Significant at 5% level

The statistical analysis using t test reveals that there is significant difference between the Pre-test and Post-test scores of experimental group regarding Critical Thinking Ability and Computational Speed of prospective teachers. ($t:17.00, P \leq 0.05$) and ($t:18.008, P \leq 0.05$).

Discussion

When the results of Analysis of Covariance of post-test scores on Computational Speed Test of participants were taken, the difference between the means was found to be statistically significant. In the post test, the obtained F-ratio for the Between Groups is 397.14 ($F_{(1, 97)} = 397.14, p < 0.01$). This indicates that the mean difference between experimental and control group is statistically significant. Also the statistical analysis using t test reveals that there is significant difference between the Pre-test and Post-test scores of experimental group regarding Critical Thinking Ability and Computational Speed of prospective teachers. ($t:17.00, P \leq 0.05$) and ($t: 18.008, P \leq 0.05$). The result clearly gives the evidences that Vedic Sutras are very effective in strengthening Critical Thinking Ability and increasing Computational Speed among the sample of study. Research on the effects of Vedic Mathematics on improving Computational Speed includes the works by Nicholas, Williams & Pickles (1984), Hope (1987), Muchlman (1994), and Haridas (2004) who concluded that “ Vedic Mathematics provides very easy, one line, mental and superfast methods”.

Findings

1. Vedic Mathematics applications are very much effective in strengthening Computational Speed and Critical Thinking Ability of prospective teachers.
2. Acquisition of the skills of Vedic Mathematics applications is a true solution in equipping prospective teachers with adequate skills.



Conclusion

One of the most important streams of higher education is teachers' training. It is from here that thousands of young men and women spread out to teach children in schools, virtually holding the destiny of the future generations in their hands. Teacher Education is ever-evolving and dynamic. In order to prepare teachers who are competent to face the challenges of the dynamic society, Teacher Education has to keep abreast of recent developments and trends.

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WOMEN EMPOWERMENT THROUGH VEDIC MATHEMATICS- A STUDY CONDUCTED AMONG KUDUMBASHREE UNIT MEMBERS OF KERALA



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ABSTRACT

The concept of empowerment as a goal of development projects and programmes has been gaining wider acceptance. By women empowerment would be able to develop self-esteem, confidence, realize their potential and enhance their collective bargaining power. Women's empowerment can be viewed as a continuum of several interrelated and mutually reinforcing components (Marilee, Karl, 1995). Indian Constitution in its fundamental rights has provisions for equality, social justice and protection of women. These goals are yet to be realized. Still women continue to be discriminated, exploited and exposed to inequalities at various levels. Inadequate education and skills development keep economies trapped in a vicious circle of low education, low productivity and low income. Skills development is central to improving productivity. Women self-help groups are at present playing a vital role in the personality and skill development of women in India. Kudumbashree, Launched by the Government of Kerala in 1998 for wiping out absolute poverty from the State is today one of the largest women-empowering projects in the country. The present paper shares the experiences of an initiative taken towards developing skills among the members of Kudumbashree unit through our intellectual traditions of Vedic Mathematics. The findings of the study throw light on the unlimited impact of Vedic One line Mental calculations in capacity enhancement among the participants through improved skills. Thus the study suggests the need of popularizing and implementing our traditional treasure of Vedic Mathematics even in the area of women empowerment.

KEYWORDS: Empowerment, Vedic Mathematics, Kudumbashree unit.

WOMEN EMPOWERMENT IN INDIA

Indian Constitution in its fundamental rights has provisions for equality, social justice and protection of women. These goals are yet to be realized. Still women continue to be discriminated, exploited and exposed to inequalities at various levels. So the concept of empowerment as a goal of development projects and programmes has been gaining wider acceptance. By women empowerment would be able to develop self-esteem, confidence, realize their potential and enhance their collective bargaining power. Women's empowerment can be viewed as a continuum of several interrelated and mutually reinforcing components (Marilee, Karl, 1995). They are: Awareness building about women's situation, discrimination and rights and opportunities as a step towards gender equality. Collective awareness building provides a sense of group identity and the power of working as a group, capacity building and skill development, especially the ability to plan, make decisions, organise, manage and carry out activities to deal with people and institutions in the world around them and participation and greater control and decision making power in the home, community and society. Thus empowerment is a process of awareness and capacity building leading to greater participation, greater decision making power and control and transformative action. The empowerment of women covers both an individual and collective transformation. It strengthens their innate ability through acquiring knowledge, power and experience. The industry and the government need to address skill development in a large way. For a rural development program like the National Rural Livelihood Mission (NRLM) a Make in Village drive with adequate skill development program for optimum use of local resources and sustainable livelihood is necessary.

Inadequate education and skills development keep economies trapped in a vicious circle of low education, low productivity and low income. Skills development is central to improving productivity. In turn, productivity is an important source of improved living standards and growth. One of the powerful approaches to women empowerment and rural entrepreneurship is the formation of Self Help Groups (SHGs) especially among women. Women self-help groups are at present playing a vital role in the personality and skill development of women in India. It is considered that Indian women are generally far behind men in aspects such as entrepreneurship skills, managerial skills, marketing skills etc. A self-help group is a voluntary association of poor women which empowers them in almost all spheres of life.

KUDUMBASHREE

Launched by the Government of Kerala in 1998 for wiping out absolute poverty from the State through concerted community action under the leadership of Local Self Governments, Kudumbashree is today one of the largest women-empowering projects in the country. Kudumbashree - State Poverty Eradication Mission has been designated as the State Rural Livelihood Mission under the NRLM. The Mission has also been designated as a National Resource Organization by the Ministry of Rural Development, for providing support to other States for taking up work under NRLM.

KEY ISSUES IN MICROFINANCE IN KUDUMBASHREE UNITS

Majority of the members in the Kudumbashree units are not well educated and

hence may lack in financial literacy. In situations of various responsibilities of money management such as Managing loans, managing debt, dealings on savings, transactions with Banks, profit management, purchasing of goods and managing day-to-day financial activities, they need help from experts.

STUDIES ON SELF HELP GROUP AND WOMEN EMPOWERMENT

Manjusha (2010) assessed the level of empowerment achieved by the women-folk of Ulladan Tribe of the North Paravur Taluk in Emakulam District of Kerala. The study is an attempt through Kudumbashree units. The findings show that a significant change has come about in the socio-economic life of the women folk in the Taluk. The study suggested that for future development, training and awareness programmes should be conducted for empowering the poor women in that area.

Kenneth and Seena (2012) studied the impact of various programmes that were introduced in order to raise the women from below poverty line in Puthanvelikkara Grama Panchayat of Emakulam, Kerala. The results of the study show that economic development is the base for other developments and Kudumbashree units drastically changed economic independence of the women and their living status.

Beevi and Devi (2011) conducted a study with an aim to assess the role of Self Help Groups in empowering rural women and to identify the major constraints faced by women in Kollam District of Kerala. Jaya (2004) evaluated the functioning of SHGs and identified the factors contributing to the successful functioning and sustainability of groups in Kerala.

VEDIC MATHEMATICS

Vedic Mathematics offers a new approach to resolving the current crisis in Mathematics education (Puri & Weinless, 1988; Puri, 1988). It is not simply a collection of new computational techniques; rather, it provides an entirely different approach to mathematical computation, based on pattern recognition (Puri, 1991). Vedic Mathematics provides very easy, one line, mental and superfast methods along with magic speed cross checking system (Puri & Weinless, 1988). As such Vedic Maths is a boon for all competitions. Vedic methods are easy to understand and their variety, speed and ease bring joy in the heart and smile on the face of the students. Williams of London says, "This element of choice in the Vedic System, even of innovation, together with mental approach, brings a new dimension to the study and practice of Mathematics. Vedic Maths with its multiple choices makes maths a playful and interesting subject, which naturally brings frequent smiles on the face and joy in the heart of learners (Puri, 1991; 1986).

WORKING MEMORY CAPACITY

Alan Baddeley defines working memory (WM) as "a brain system that provides temporary storage and manipulation of the information necessary for such complex cognitive tasks as language comprehension, learning, and reasoning" (Alan Baddeley (1992). Working memory refers to a complex cognitive system that is responsible for the storage and processing of information in the short term. Also working memory known as a mental workspace, that involved in controlling, reg-

ulating, and actively maintaining relevant information to accomplish complex cognitive tasks (e.g. mathematical processing)(Ashcraft, (1994)). Working memory capacity (WMC) is essential for important cognitive abilities including reasoning, comprehension and problem solving (Case, (1974)). There is a weight of evidence suggesting that working memory is a good predictor of mathematical skills (Denis et al. (2012)). There is also direct evidence that WMC has an impact on children's ability to perform mathematical tasks at school. Gathercole and co-workers (Gathercole et al 2004) found significant impairments in WMC in a group of children who had scored below the expected level in national mathematics tests at age 7. Moreover, Pickering & Gathercole (2004), have found that the students with high WMC are more capable of solving math word problems compared to those with low WMC.

To perform mental calculations in Vedic Mathematics Learning, learners have to temporarily hold and manipulate the digits in the memory system and then find the answers. By doing such activities or exercises, working memory gets sharpened. Because the ability to focus is needed to do well on almost any cognitive task one can name, such as mental calculation, people with higher working memory capacity also do better on any sphere of life.

NEED AND SIGNIFICANCE OF THE STUDY

In India, women constitute nearly 50 percent of national population and a very important human resource for the nation's development. According to the survey report Indian women constitute 47 percent of total urban population. The participation of women in the country's GDP is as low as 8 percent though their work participation was 19.7 percent in 1981. In India according to the Census 2001, the female labour force participation rate in their total population is 25.7 percent but it is 31 percent in rural and 11.6 percent in urban areas. They are engaging in different sectors. SHG consists of economically backward members from homogenous background and hence lack basic education. They can be easily exploited by intermediaries in financial disbursement and marketing of their products.

India has a large number of women SHGs and they are a more vulnerable section of the poor. Equipping them with skill will bring economic freedom. In India traditionally women are responsible for upbringing of children and care taker of old members in the family. A more empowered mother would make a difference to the future generation in the hinterland.

Kudumbashree unit at Nedunganda, Anchuthengu Grama Panchayat, Thiruvananthapuram, Kerala

These women are from different caste groups such as Scheduled Caste (SC), Scheduled Tribes (ST), most backward Caste (MBC) backward caste (BC) and minority groups (Muslims). Most of them are illiterates/semi-literates. Only 15 percent of this population own economic assets, such as weaving looms, fish marketing, cows and goats, or a petty shop business. If they need money, they cannot go to a bank to get a loan, so often their only choice is to get a loan from a local money-lender, who usually charges outrageous interest rates (sometimes more than 100%!). Often such debts cannot be paid off in time, and the individual or the family gets in deeper poverty, and sometimes leads to suicide. The situation is especially poor for women, because they have often little or no economic status, and especially when their husband is working elsewhere, they have to face severe financial hardship. It is essential to impart certain account training to them.

Skill development makes sense when foundation is made strong by imparting the basic R's. It was reported by the Report of Voluntary Operation in Community Planning Commission and Environment (VOICE) Government of India, A Report on the Success and Failure of SHG's in India - Impediments and Paradigm of Success, (2008) that "Motivation training for income-generating activities and technological training for capacity building should be organized by competent agencies with greater seriousness, Training programme on (a) Health education (b) formal education for school going, school dropout children and awareness about prevalent social evils should be given adequate priority". Hence conscientizing women on the intellectual traditions of Vedic Mathematics and empowering them through its mental computational applications for economic literacy, self sufficiency, self reliance and above all better home makers and thus Nation builders is the need of the hour. Here lies the significance of the study

OBJECTIVES OF THE STUDY

The study was conducted among the Kudumbashree members of Thiruvananthapuram District in the Kerala state. The present study was undertaken with the following objectives:

1. To identify the impact of Vedic Mathematics in enhancing Computational Speed of Kudumbashree members
2. To test the effect of the Supreme power of Vedic Mathematics in stimulating the Working Memory Capacity of adults, especially women
3. To empower women by attaining self reliance through Indian intellectual tradition of Vedic Mathematics

HYPOTHESES OF THE STUDY

The following hypotheses were formulated by the investigator for the study

1. Vedic Mathematics applications are very much effective in enhancing Computational Speed of Kudumbashree members of Kerala.
2. Vedic Mathematics applications are having the Supreme power in stimulating the Working Memory Capacity of adults, especially women.
3. Vedic Mathematics applications are powerful in empowering women through enhancing their cognitive skills with respect to Computational Speed and Working Memory Capacity

METHODOLOGY

Population and profile of the sample

The study is mainly based on primary data, and the secondary data is used to supplement and support the primary data.

The population of the study is the Kudumbashree members of Thiruvananthapuram District. Awareness classes cum demonstration on select Vedic sutras were carried out covering all areas of Thiruvananthapuram District. The sample population includes those members who were active in the Kudumbashree group of Nedunganda during the period, April 2015- November 2016 and were assembled at a common venue of Sree Narayana Training College, Nedunganda as well in their meeting place weekly. The Kudumbashree members were individually met for collecting accurate data directly. A random sample of 250 members was selected for the study

Table 1 Age -Wise Classification of Respondents Numbers.

Respondents	No.	Percentage
18 - 30 Years	37	15
31 - 42 Years	64	26
43 - 54 Years	120	48
Above 55 Years	29	11
Total	250	100

Design, participants and procedure

A package of select vedic sutras, pre-tested computational speed test, a Working Memory Capacity test and a structured questionnaire prepared in local language were used as tools. Before the intervention, a pre-test was conducted among the group members. At the end, Post-Test was administered and the scores were collected. After an interval of 1 month, a retention test was given without any notice. The same tool was used for administering the retention test. Appropriate statistical technique like Repeated ANOVA, LSD test of post hoc comparison were used for testing the impact of Vedic sutras in attaining pre-determined objectives and interpreted accordingly.

DATA ANALYSIS

Mean values and Standard Deviations of Working Memory Capacity Test scores in pre, post and retention tests of experimental group

Group	N	Mean	SD
Pre Experimental	250	123.27	17.85
Post Experimental	250	39.70	6.26
Retention Experimental	250	39.79	6.27

Summary of Repeated ANOVA of Working Memory Capacity Test scores in pre, post and retention tests of experimental group

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	562485.07	2	281242.53	2378.00**
	Between Subjects	19096.93	249		
	Error	28143.60	498		
	Total	609725.60	749	118.25	

**Significant at 0.01 level;

*Significant at 0.05 level

Results of LSD Test for significance between pairs of means Working Memory Capacity Test scores of the experimental group

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental	123.27	83.57**
	Post-Experimental	39.70	
2	Pre-Experimental	123.27	83.48**
	Retention Experimental	39.79	
3	Post-Experimental	39.70	
	Retention Experimental	39.79	

**Significant at 0.01 level



Mean values and Standard Deviations of computational speed scores in pre, post and retention tests of experimental group

Group	N	Mean	SD
Pre Experimental	250	17.71	3.48
Post Experimental	250	8.10	0.88
Retention Experimental	250	10.00	0.18

Summary of Repeated ANOVA of Computational Speed scores in pre, post and retention tests of experimental group

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	6213.94	2	3106.97	716.95**
	Between Subjects	510.20	249		
	Error	1031.39	498	4.33	
	Total	7755.53	749		

**Significant at 0.01 level

Results of LSD Test for significance between pairs of mean scores of Computational Speed Test of experimental group

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental	17.71	9.61**
	Post-Experimental	8.10	
2	Pre-Experimental	17.71	7.71**
	Retention Experimental	10.00	
3	Post-Experimental	8.10	1.90**
	Retention Experimental	10.00	

**Significant at 0.01 level

DISCUSSION

When the results of Variance of post-test scores on Working Memory Capacity Test and Computational Speed Test of participants were taken, the difference between the means was found to be statistically significant ($F(1,249) = 2378; p < 0.01$) and ($F(1,249) = 716.95; p < 0.01$). The result clearly gives the evidences that Vedic Sutras are very effective in enhancing Computational Speed and Working Memory Capacity among the sample of study. Research on the effects of Vedic Mathematics on improving Computational Speed includes the works by Nicholas, Williams & Pickles (1984), Hope (1987), Muchlman (1994), and Haridas (2004) who concluded that "Vedic Mathematics provides very easy, one line, mental and superfast methods".

FINDINGS

1. The Vedic Methods are effective in improving Computational speed among the Women Self Help Groups.
2. The practice and application of Vedic Mathematics helps in enhancing the Working Memory Capacity among the Women Self Help Groups.
3. The continuous practice and application of Vedic One line method of computation indirectly empower the women community in their overall personality development

CONCLUSION

Women empowerment is the best strategy for poverty eradication. Rural women, who were regarded as voiceless and powerless started identifying their inner strength, opportunities for growth and their role in reshaping their own destiny. The process of empowerment becomes the signal light to their children, their families and the society at large. In the midst of various skill development programmes which are being successfully conducted by the Government, inclusion of training programmes on Vedic Sutras, our traditional treasure of intellectual culture will surely make them self reliant in all means. It makes incredible changes in our India.

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Vedic Mathematics - an Instructional Strategy for enhancing Mental Computation among Visually Challenged Students

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Abstract

The present paper shares the experiences of an initiative taken towards developing skills among Visually Challenged Students through our intellectual traditions of Vedic Mathematics. Visually Challenged are a potential Human Resource. It is time to look at them in that light. Our perspective needs to shift from merely providing for them to investing in them. There is an urgent need for investing and upgrading the education that the blind child receives. These blind children need to grow up with dreams and desires to be part of the mainstream rather than to be reconciled to a reserved position in the Public Sector. In visually impaired children, this exercise could start with the learning of the rich treasure of Vedic Mathematics. The findings indicate that instructional strategies based on Vedic Mathematics Mental Computation for blind children can help to support and develop their intellectual capabilities, thus helping to close the gap between sighted and blind children.

Keywords: Vedic Mathematics, Mental Computation, Visually Challenged.

Introduction

Mental Computation

Mental computation is viewed as an essential prerequisite to the successful development of thinking faculties (The Australian Association of Mathematics Teachers Inc., 2000). Mental computation act as powerful means for promoting thinking, conjecturing, and generalising based on conceptual understanding. The ability to compute mentally with truncated and rounded numbers is a prerequisite for computational estimation. Additionally, mental strategies used to refine estimates may assist in the development of flexible approaches for calculating exact answers; getting closer may ultimately result in turning approximate answers into exact.

Number sense depends upon, and contributes to, the development of a deeper understanding of the structure of numbers and their properties. Further, nevertheless, despite the ongoing advocacy for an increased emphasis on teaching rather than testing mental computation, this has yet to significantly translate into classroom practice. For school mathematics to be useful, it needs to reflect the computational techniques used in everyday life.

Visually Challenged are Potential Human Resources

Blind person feels worthlessness and thinks that he or she is only a heavy, useless burden for the family or society (Bauman & Kropf (1979)). But, it is achievable to adjust to blindness with the support of family and society so that the

life becomes joyful and interesting. They require certain skills to support themselves. Doing mathematics with numerals

is important for children with and without sight since numerals are the symbolic notations for mathematics.

Visually Challenged are a potential Human Resource.

It is time to look at them in that light. Our perspective needs to shift from merely providing for them to investing in them.

There is an urgent need for investing and upgrading the education that the blind child receives. It might be difficult to setup an inclusive schooling system but the special schools can certainly be upgraded. There is a great need for quality teachers who deliver learning with passion and purpose. These blind children need to grow up with dreams and desires to be part of the mainstream rather than to be reconciled to a reserved position in the Public Sector.

Since no single device would be exclusively useful for visually impaired children for their calculations in mathematics, it is quite reasonable to look into the task of developing mental arithmetic abilities in them. Like all other activities, this too needs systematic instruction, practice and application. In visually impaired children, this exercise could start with the learning of the rich treasure of Vedic Mathematics.

Vedic Mathematics

In an attempt to find a better approach to learning mathematics, as an alternative option it is possible to apply calculation by using Vedic mathematics. Vedic mathematics is a calculation system based on 16 sutras (Sanskrit formulas) the basic feature of which is a simplicity of calculation without the written computation, which can stimulate the students' interest in mathematical thinking and creativity in finding solutions to mathematical problems (Miloloza, 2008.).

According to Sri Bharati Krsna Tirthaji, Vedic Mathematics is based on sixteen Sutras. With the help of Vedic mathematics any one can solve 'difficult' problems or huge sums without much difficulty. The problems can be calculated by mentally is one of the simplicities of Vedic mathematics. By using Vedic mathematics we have many advantages. One can use or discover his or her own method to solve their problems.

There are many methods to solve problems. One can select any method according to his/ her convenience. This helps the students to be more creative. Modern mathematics has established methods and allows the use of calculators. In the case of Vedic math, it is flexible and encourages the use of arithmetic, geometry & trigonometry.

This may contribute to brain development in children. It is the duty of teachers to preserve our traditions as well as lead our students to be self-dependent & solve the mathematics problems with confident. Mathematics being a compulsory subject of present curriculum and also getting basic mathematics education is each and every child's right. It is the duty of the teacher to give quality education to all students by teaching them the way they learn

Vedic Mathematics not only helps to boost the arithmetic and calculation skills but also actively engage the brain and strengthens concentration. Similar to all the other programmes offered to children, Vedic Mathematics classes too have therapeutic benefit on the children and are an excellent means of teaching the differently-abled children in a special way. The knowledge and practice of Vedic Mathematics helps them acquire skills that enhance their employability. Vedic One line mental computation sutras can be surely taken as a catalyst for special-needs education tools for students without sight.

Thus the application helps in creating a bright and sustainable future for visually impaired children through holistic education, skill development and self-empowerment. This enables to empower differently abled individuals to take their

place in society as confident, productive citizens and to stand on their feet and create a brighter future for themselves. The practice and application of Vedic Sutras helps them acquire confidence in securing good government jobs and a stable income and thus become independent and contributing members of society.

Research Framework

The present study aims at testing the effectiveness of an Instructional Strategy using Vedic Mathematics for enhancing Mental Computation among visually challenged students. The selected Vedic Sutras were “**Ekadhikena Purvena**”, “**Antyayordasakepi**” and “**Urdhva Tiryagbhyam**”

Thus, the **main questions** addressed here are:

Can Vedic Mathematics be considered as an alternate strategy in enhancing Mental Computation among visually challenged students?

Do Vedic Mathematics applications enhance the computational speed through Mental Computation among visually challenged students?

In an attempt to answer these questions the following **objectives** were sought:

The Specific Objectives of this Study are:

1. To review what is known from the research and professional literature about teaching mathematics to visually challenged students.
2. To develop an Instructional Strategy using Vedic Mathematics for enhancing Mental Computation among visually challenged students.
3. To test to what extent an Instructional Strategy using Vedic Mathematics skill training improve the computational speed of Visually Challenged students.
4. To evaluate the effectiveness of the Instructional Strategy using Vedic Mathematics by analysing the outcomes.

The following **hypothesis** was formulated by the investigator to lead the study

Vedic Mathematics applications are very much effective in enhancing Computational Speed of Visually Challenged students

Purpose and Method of study

The present study aims at testing the effectiveness of the Instructional Strategy using Vedic Mathematics with the application of Vedic Sutras for enhancing Computational Speed through Mental Computation among Visually Challenged students. The investigator selected the Single Group Pretest-Posttest Design (Gay, 1987).

Participants

The participants were 80 secondary school students from Kristu Jyothi Blind School, a well-known blind school in an urban area of Thiruvananthapuram District of Kerala State, India. These students had been diagnosed with severe visual impairedness as per the school authorities. Head Teacher and other teachers of the blind school were also participated in the intervention process for monitoring the classes. Fifty-five participants were male (68.8%) and twenty-five were female (31.2%).

Materials

The tools used for the study were:

1. Modules prepared on Vedic Mathematics “**Ekadhikena Purvena**”, “**Antyayordasakepi**”, and “**Urdhva Tiryagbhyam**” Sutras for multiplication.
2. Computational Speed Test

Teacher Training

The four mathematics teachers who taught the experimental groups attended a 3-day instructional program (15 hours of class instruction and 30 hours of home practice) on Vedic Mathematics. The content included (a) format of Modules, (b) basic knowledge of Number system and base numbers, (c) basic computational skills (addition, subtraction, multiplication, and division), (d) Sutras on “**Ekadhikena Purvena**”, “**Antyayordasakepi**”, and “**Urdhva Tiryagbhyam**” for multiplication. A master teacher (a professor in Curriculum and Instruction), and a researcher on Vedic Mathematics conducted the training program.

Intervention Stage

Before beginning the Intervention, students were randomly assigned to four experimental groups with $n=20$ in each group. Each group was taught by different teachers with the help of the prepared Modules and as per the instructions given at the period of Training. The study therefore consisted of 4 experimental groups. The intervention started with a rapport creation with the students by the Research Team Members followed by an oral pre-test. The pre-test on Mental Computation includes twenty questions on basic fundamental Multiplication as per the select sutras which have a scoring weightage of one mark each. The time taken to complete each question correctly was noted. After recording the Pre-test scores, the intervention has started and it continued for one week. On the final day, the same Mental Computation Speed Test was administered as Post-test. The scores were collected.

Data Analysis

T-Tests were performed to determine whether there were statistically significant differences between the Pre and Post scores of the experimental groups in Mental Computation skills including achievement and speed. (See Table 1 for comparisons means of the pre-test and post-test scores).

Table 1 - Results of T-Tests on Pretest and Posttest Scores for Experimental Group

Skill Area	Pretest (N=80)		Posttest (N=80)		t- Value
	M	S.D.	M	S.D.	
Achievement	8.6	2.4	17.4	1.6	49.16*
Computational Speed (Minutes)	34	4.2	18	2.3	64*

*significant at 0.05 level

T- Tests showed significant differences in Achievement Scores (49.16; $p<0.05$) and Mental Computation Speed scores (64; $p<0.05$). The findings with regard to Computational Speed are probably the most salient feature of this study. Statistical analyses reveal significant differences between the Pretest and Posttest scores of experimental group ($M_1=34$

Minutes and M2=18 Minutes) in the Computational Speed. Also the Achievement scores also differ significantly (M1=8.6 and M2=17.4) which again reveals the effectiveness of the strategy.

The extent to which a curriculum that includes Vedic One line mental computation skill training improves the computational abilities of visually challenged students was investigated in the study. These results suggest that having Vedic One line mental computation fully embedded into the existing math curriculum, it had a positive impact on computation. Results of this study are consistent with previous research in which Vedic mental calculation was found to be a powerful technique in enhancing students' computational skills (Nicholas, Williams & Pickles (1984), Hope (1987), Muchlman (1994), and Haridas (2004)) who concluded that "Vedic Mathematics provides very easy, one line, mental and superfast methods".

Findings

1. The Vedic Method of multiplication is effective in improving Mental Computation speed among Visually Challenged students.
2. Application of Vedic Sutra is more effective than the existing system of Mathematics instructional procedure in improving computational speed and positive mathematics attitude.
3. The Vedic Sutra for Multiplication is effective for the Secondary School Students in retaining their Computational Speed and positive mathematics attitude.

Educational Implications

Objectives for educating visually impaired students have been dealt with and often revised over the years as understanding of the educational implications of the impairment became more universal. Lowenfeld (1973) stated that: Education must aim at giving the blind child knowledge of the realities around him, the confidence to cope with these realities and the feelings that he is accepted as an individual in his own right. (p. 158). Education is a process of human enlightenment and empowerment for the achievement of a better quality of life. Mathematics education is crucial to the entire developmental process of the country. Mathematics is poorly taught and badly learnt, it is little more than burdening the mind with dead information, and it could degenerate even into a new superstition. Mathematics has added a new dimension to education and to its role in the life of the nation, but central to all this is the quality of education. This finding of the great applications of Vedic Mathematics should enlighten educational authorities to devise instructional strategies across the curriculum to enhance the Mental Computational abilities of Visually Challenged students. This, in turn, will go a long way in the uplifting the society and enriching education through our rich cultural heritage of Vedic applications.

Conclusion

Overall, the results of this study support the contention that Vedic mental calculation skill training has positive effects on visually challenged students' learning. It can be used to develop number concepts, increase efficiency in mathematical calculations, and improve students' ability to apply mathematical skills to real-life situations. Imbedding Vedic mental computational training into all aspects of a math curriculum is an innovative strategy in the current math curriculum reform for the visually challenged. Vedic one line mental calculation permits children to find different ways to perform computation and can meet the needs of students with special disabilities (Richards, 1994).

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Capacity Building in Fishermen Community through Vedic Mathematics

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ABSTRACT

Fisher folk form an important community in Kerala, but remain neglected and marginalized in spite of the higher socio-economic progress the state has made as a whole. While we consider fisher folk, they remain isolated from the main stream of development. They remained educationally backward also. It is well known that a rapid growth in educational attainment is the most successful medium for social empowerment of the disadvantaged. The path towards our goal of achieving progress and prosperity of the nation is necessarily through equipping the backward sections through knowledge and skills. They need to be empowered by equipping them with self-sufficiency and existence skills such as Self Confidence, Problem Solving Ability, Logical thinking, Decision Making Power, Computational Speed and Reasoning etc. The present paper throws light on the Supreme power of Vedic Mathematics in enhancing these skills.

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Introduction

The State of Kerala, India, well known as God's own land is abundantly rich with marine, backwaters, rivers and fresh water resources. Kerala being a maritime State has tremendous potential resources teeming with fish. It is one of the leading maritime states in India. The coast of Kerala provides one of the richest fishing zones in the world. The fishermen resources include both artisanal and mechanized groups. The population of fisher folk of Kerala is about 12 lakhs, which includes 8.46 lakhs in the marine sector and 3.2 lakh in the inland sector. Out of this the number of active fishermen is estimated as 2.54 lakhs, of this 1.91 lakh is in the marine sector. The fishermen settlements are spread over in 222 fishing villages in marine sector. Those who depend upon the marine sector of the State for the livelihood constitutes about 8.46 lakh, which comes to about 2.51% of the State's total population. The number of fishermen households is estimated to be 1.61 lakhs. The number of active fishermen is 1.91 lakh and almost an equal number of people are presently engaged in fishery related activities such as vending, processing and marketing. The density of population in the marine fishing villages works out to 2162 per sq. km as against 819 of the average density of Kerala.

Fisher Folk Community and Problems of Education

Fisher folk form an important community in Kerala, but remain neglected and marginalized in spite of the higher socio-economic progress the state has made as a whole. While we consider fisher folk, they remain isolated from the main stream of development. Although, Kerala boasts of the highest quality of life in the country as measured by human development indicators, the state's fishing community has largely been left out of the general development experience. For example, the literacy level, educational attainment of fisher folk is much lower than that of the general population (Department of Fisheries, 2005). Other development related indicators such as lack of income-earning opportunities,

poverty and deprivation, insanitary and overcrowded living conditions, lack of access to basic services such as water, sanitation, electricity, poor health conditions amongst men and women, higher infant mortality rates, lower sex ratio and lack of access to health facilities, also show evidence of this neglect and marginalisation of the fisher folk in the state (Asian Development Bank, 2003).

Review of Literature

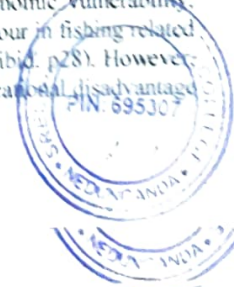
One of the most rigorous studies of literacy in fishing communities in South Asia is presented by George and Domi (2002). Their paper is part of a broader study of educational disadvantage (George 1998) and discusses 'Residual Illiteracy' in Poovar Village in Thiruvananthapuram district of Kerala. The broader context of the study is Kerala, where rates of literacy are higher than in many other States of India. This can be attributed to multiple factors including cultural and educational traditions, economic policy and widespread access to schooling. Their in-depth statistical survey of the fishing village used census methods to assess literacy rates of fisherfolk and other occupational groups. They found that literacy rates among the population over seven years of age were 78%, with women's literacy rates (79.6%) being higher than those of men (76.6%). They found that within working adults around two thirds of people were literate, and within the fisherfolk, 53.22% of fishermen were literate, and 43.84% of fish-vending women (*ibid.*, p25-28). George and Domi argue that the literacy rates within fishing communities are low compared with other occupational groups. They cite statistics from Kurien (1995) that indicate that within Kerala in 1981, the literacy rates of fish workers was lower than all working adults as a group (George and Domi 2002:15). They suggest that low rates of literacy are the result of multiple factors (such as community values, economic vulnerability, migration, male and female child labour in fishing related activities and domestic responsibilities) (*ibid.*, p28). However, they argue that the primary cause of educational disadvantage

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is the result of marginalisation: 'the fisherfolk community has remained at the margins of society, geographically, economically, socio-culturally, and politically' (George and Domi p7, citing Kurien and Achari 1998).

Need for Empowerment

One factor leading to the decline of the fishermen's welfare is actually seasonal in nature. In other words it really depends on the climatic periods which sometimes cause to lower the number of fish to be caught. Consequently, the business on fishery processing is in trouble. This even worsens when the fishermen's only way of living is on fishery business in the sense that they do not have other jobs. Hence the income generation is severely uncertain. They remained educationally backward also. Education has been treated as a fundamental human rights enshrined in the Universal Declaration of Human Rights and the International Human Rights Covenants, achieving the rights for the basic education, particularly for the underprivileged sections of the society is not only the obligation of the State, but the biggest moral responsibility. It is well known that a rapid growth in educational attainment is the most successful medium for social empowerment of the disadvantaged. The path towards our goal of achieving Progress and prosperity of the nation is necessarily through equipping the backward sections through knowledge and skills. They need to be empowered by equipping them with self-sufficiency and existence skills such as Self Confidence, Problem Solving Ability, Logical thinking, Decision Making Power, Computational Speed and Reasoning etc. Hence the study focuses on (1) how fishermen can survive in the modern life flavored with rapid growth of technological and industrial revolution; (2) what elements of the foreign culture should be accommodated and integrated into the local knowledge and (3) How the authorities can direct the maintenance and development of the local knowledge and skills collectively attached and obtained from community itself, makes the skill become a potential energy resource to live together peacefully, dynamically in a civil society.

Vedic Mathematics, a Suitable Tool for Capacity Building

Vedic Mathematics offers a new approach to resolving the current crisis in education (Puri & Weinless, 1988; Puri, 1988). It is not simply a collection of new computational techniques; rather, it provides an entirely different approach to mathematical computation, based on pattern recognition (Puri, 1991). It has since been shown that the system is equally applicable to more up-to-date aspects of mathematics both at an elementary level as well as in more sophisticated fields (Nicholas, Williams, & Pickles, 1984). The reason that this is possible relies on the nature of the sutras. They frequently describe how the mind approaches, or deals with, a problem in the earliest way (Puri & Weinless, 1988). The Vedic system teaches this sort of approach systematically rather than leaving it to chance and hence we find a number of different possible methods for any particular sum. This is of tremendous use because it enhances variety of strategy. It also enables the subject to be kept alive by directing the attention towards underlying pattern and relationship (Stoddard, 1962; Starkey & Gelman, 1982). It is a system with mental multi choice procedures, which keep the mind alert and active. It is a complete and more natural Vedic System, which brings out the naturalness and ease of a computer based computation. It brings smiles on the face and joy in the heart of the students which bring mental strength and

confidence (Puri, 1986). Further, Vedic Mathematics reduces anxiety and increases playfulness.

This spark tempted the investigator to implement Vedic computational strategies in improving computational speed, problem solving ability, and Logical and Reasoning Skills of fishermen community and thereby empower them to be skillful enough in order to meet the situational challenges of life.

Brief Profile of Anjuthengu Fishing Village

Anjengo fisheries village is spread over five wards of Anjengo Gram Panchayat. The village has a total of 2030 houses and 2070 households are living there. Among them, 45 households are landless or presently living as a joint family. About 89.65 percent of the existing houses in the village have sanitary toilets. Safe drinking water is available to 91.18 percent of the existing houses. More than three fourth of the houses in the village (92.31 %) are electrified. The village has one LP School, one high school and higher secondary school. Four anganwadis are functioning in this village. The literacy rate of Anjengo panchayat is 73% (PCO, 1999). The school reports throw light on the fact that the dropout rate is high and the students or even the parents are not at all interested in studies. Parents encourage their children go for fishing related works and earn for daily expenditure. Children are not bothered on their future progress and they often unknowingly indulge in antisocial activities.

Hence the investigator, being a responsible teacher and a social activist has decided to conduct the intervention activities among the community members of Anjengo Panchayat.

Objectives of the Study

The study was conducted among members of Fishermen community. The present study was undertaken with the following objectives:

1. To test the effectiveness of the Supreme power of Vedic Mathematics in enhancing Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen.
2. To equip the Fishermen Community with self-confidence by attaining skills of Numerical Ability, Problem Solving Ability and Computational Speed through Indian intellectual tradition of Vedic Mathematics

Hypotheses of the Study

The following hypotheses were formulated by the investigator to lead the study

1. Vedic Mathematics applications are very much effective in enhancing Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen.
2. Acquisition of the skills of Vedic Mathematics applications is the true solution in equipping fishermen community with self-confidence.

Methodology

Population and profile of the sample

In this paper the researcher made an attempt to enhance the Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen Community and thereby increase their Self-Confidence. The sample selected were 54 members of Fishermen community of Anjuthengu fishing village of Thiruvananthapuram District of Kerala State, India. The samples were selected using random sampling technique. All the members were invited to assemble their Anjuthengu Members assembled their representatives for a week to attend the class.

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Design, participants and procedure

The design selected for the study was Pre-test Post-test Single group design. A package of select Vedic Sutras with 'Ekadhikena Purvena', Ekanyunena Purvena and Urdhav Tiryagbhyam, pre-tested Numerical Ability Test, Problem Solving Ability Test, Computational speed test were the tools. Before the intervention, a pre-test was conducted among the sample. At the end, Post-Test was administered and the scores were collected. After an interval of 1 month, a retention test was given without any notice. The same tools were used for administering the retention test. Appropriate statistical technique like Repeated ANOVA, LSD test of post hoc comparison were used for testing the impact of Vedic sutras in attaining pre-determined objectives and interpreted accordingly.

Data Analysis

Table 1. Mean values and Standard Deviations of Numerical Ability scores in pre, post and retention tests of Fishermen in experimental group.

Group	N	Mean	SD
Pre Experimental	54	6.81	2.04
Post Experimental	54	16.66	1.62
Retention Experimental	54	16.61	1.63

Table 2. Summary of Repeated ANOVA of Numerical Ability scores in pre, post and retention tests of Fishermen in experimental group.

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	8025.49	1	4032.74	863.24**
	Between Subjects	686.53	53	3.49	
	Error	1069.18	106		
	Total	9781.20	159		

Table 3. Results of LSD Test for significance between pairs of mean scores of numerical ability of Fishermen of the experimental group.

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental	6.81	9.85**
	Post-Experimental	16.66	
2	Pre-Experimental	6.81	9.80**
	Retention Experimental	16.61	
3	Post-Experimental	16.66	0.05
	Retention Experimental	16.61	

** Significant at 0.01 level

Table 4. Mean values and Standard Deviations of Problem Solving Ability scores in pre, post and retention tests of Fishermen in experimental group.

Group	N	Mean	SD
Pre Experimental	54	5.21	2.57
Post Experimental	54	17.10	1.52
Retention Experimental	54	16.63	1.67

Table 5. Summary of Repeated ANOVA of Problem Solving Ability scores in pre, post and retention tests of Fishermen in experimental group.

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	9183.07	1	4691.55	1251.00**
	Between Subjects	598.00	53	2.40	
	Error	808.26	106		
	Total	10589.33	159		

**Significant at 0.01 level

Table 6. Results of LSD Test for significance between pairs of mean scores of Problem solving ability of Fishermen of the experimental group.

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental	5.21	11.89**
	Post-Experimental	17.10	
2	Pre-Experimental	5.21	11.42**
	Retention Experimental	16.63	
3	Post-Experimental	17.10	0.47**
	Retention Experimental	16.63	

** Significant at 0.01 level

Table 7. Mean values and Standard Deviations of computational speed scores in pre, post and retention tests of Fishermen in experimental group.

Group	N	Mean	SD
Pre Experimental	54	19.71	3.68
Post Experimental	54	9.12	0.85
Retention Experimental	54	9.63	0.28

Table 8. Summary of Repeated ANOVA of Computational Speed scores in pre, post and retention tests of Fishermen in experimental group.

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	6213.94	1	3326.97	816.75**
	Between Subjects	510.20	53	4.31	
	Error	1031.39	106		
	Total	7755.53	159		

**Significant at 0.01 level

Table 9. Results of LSD Test for significance between pairs of mean scores of Computational Speed Test of Fishermen in experimental group.

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental	19.71	10.59**
	Post-Experimental	9.12	
2	Pre-Experimental	19.71	10.08**
	Retention Experimental	9.63	
3	Post-Experimental	9.12	0.51**
	Retention Experimental	9.63	

** Significant at 0.01 level

Discussion

When the results of Analysis of Variance of post-test scores on Numerical Ability Test, Problem Solving Ability Test and Computational Speed Test of participants were taken, the difference between the means was found to be statistically significant ($F(1,53) = 863.24$; $p < 0.01$), ($F(1,53) = 1251.00$; $p < 0.01$) and ($F(1,53) = 816.75$; $p < 0.01$). The result clearly gives the evidences that Vedic Sutras are very effective in enhancing Numerical Ability, Problem Solving Ability and Computational Speed among the sample of study. Research on the effects of Vedic Mathematics on improving Computational Speed includes the works by Nicholas, Williams & Pickles (1984), Hope (1987), Muchlman (1994), and Haridas (2004) who concluded that " Vedic Mathematics provides very easy, one line, mental and superfast methods".

Findings

1. Vedic Mathematics applications are very much effective in enhancing Numerical Ability, Problem Solving Ability and Computational Speed of Fishermen Community.
2. Acquisition of the skills of Vedic Mathematics applications is the true solution in equipping Fishermen Community with self-confidence.
3. The continuous practice and application of Vedic One line method of computation indirectly empower the Fishermen community in their overall personality development

The emphasis for adult literacy programmes should be on linking literacy and numeracy learning with people's aspirations and real-life contexts for literacy and numeracy use. Even in contexts where there are low levels of literacy it appears that there may be significant motivation for learning, and scope for application that would support people's livelihoods. Assimilation of Vedic Mathematics can contribute much in this venture.

Conclusion

Kerala has made substantial contribution to the world fisheries. Lower literacy rate and bad health among the fishing community in the coastal parts of Kerala, reflects the deprivation of the fisher folks and also to some extent explains the cause of their economic backwardness and poverty. Lack of educational attainments deprive these coastal fishermen from the information and exposure of the modern technologies which results in prevailing ignorance among the fisher folks which makes the commercial firms to exploit them. Lack of Numeracy and literacy skills force them to rely upon middlemen for money borrowing and lending purposes which leads to their exploitation in all means. Due to the lack of awareness and computational skill deficiency, these people are being cheated by middlemen, who actually control the fish marketing and management. In order to save them from such a deprived condition, Skill enhancement and thus empowerment is needed.

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Editorial

The goal of our new education system should be to create entrepreneurs, innovators, artists, scientists, thinkers and writers who can establish the foundation of knowledge based economy rather than the low-quality service provider nation that we are turning into.

Creating a few more schools or allowing hundreds of colleges and private universities to mushroom is not going to solve the crisis of education in India. And a crisis it is – we are in a country where people are spending their parent's life savings and borrowed money on education – and even then not getting standard education, and struggling to find employment of their choice. In this country, millions of students are victim of an unrealistic, pointless, mindless rat race. The mind numbing competition and rote learning do not only crush the creativity and originality of millions of Indian students every year, it also drives brilliant students to commit suicide. In our country people see education as the means of climbing the social and economic ladder. If the education system is failing – then it is certainly not due to lack of demand for good education, or because a market for education does not exist.

Education system in India is failing because of more intrinsic reasons. There are systemic faults that do not let our demand for good education translate into a great marketplace with excellent education services. Our education system is geared towards teaching and testing knowledge at every level as opposed to teaching skills. Also our system should reward creativity, original thinking, research and innovation. India needs to embrace internet and technology if it has to teach all of its huge population, the majority of which is located in remote villages. Now that we have computers and internet, it makes sense to invest in technological infrastructure that will make access to knowledge easier than ever. Instead of focussing on outdated models of brick and mortar colleges and universities, we need to create educational delivery mechanisms that can actually take the wealth of human knowledge to the masses. The tools for this dissemination will be cheap smart phones, tablets and computers with high speed internet connection.

By considering these points, this Issue of the journal respond to these challenges through some articles.

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A Profile of Financial Management of Rural Families in Varkala Taluk

Dr. Sheeba.P

ABSTRACT

Money is inevitable for leading a peaceful and comfortable life. Too much money sometimes becomes a curse. But the nature of financial management of the people of a country is very important for the well being of her citizens. The rural people face a lot of problems related to money mismanagement. The investigator studied the financial management of the rural families in Varkala Taluk. The investigator surveyed 110 families in the rural areas of Varkala Thaluk by using a questionnaire prepared by the investigator and arrived at the following conclusions. The problem of financial management among the forward and OBC class are not so crucial, but the financial management of SC/ST families is very poor. Hence some remedial measures should be taken to improve their financial management. Again there is a positive correlation between the education level and financial status of families.

Key words: profile, financial management

Introduction

Everyone wants to lead a happy and peaceful life. For this, money is an inevitable thing. Most of the people make enough money still they are not satisfied with the way in which they spend the same. Some people lead very luxurious life even though they do not have sufficient money. If some kind of financial emergency occurs in such families, they feel difficulty in solving it. Some people spend more money than they got. There are some people who got only a very little amount, but they meet every expenses successfully. This situation shows that there is some problem in the way in which people spend money. There lies the significance of the study.

The problem of financial management is more often occurs among the backward people in villages. But, from the experiences, it is clear that, the financial management of the educationally and socially backward group of people have some difficulty. Hence it is decided to study the financial management of the rural people and the study was entitled as "A PROFILE OF FINANCIAL MANAGEMENT OF RURAL FAMILIES IN VARKALA TALUK."

Objectives of the Study

The important objectives of the study are the following:

1. To find the educational level of rural families in Varkala Taluk.

- ii. To find the number of families having at least one child with educational qualification SSLC or above in the rural families in varkala Taluk
- iii. To know the nature of financial management of rural families in Varkala Taluk
- iv. To know the financial level of the rural families in Varkala Taluk
- v. To find the relationship between the educational level and financial management of rural families

Hypothesis of the Study

1. There exists a positive and significant relation between educational level and the financial management of families in the rural areas of Varkala Taluk

Methodology of the study

The normative survey method was adopted by the investigator to study the profile of financial management of rural families in Varkala Taluk. The sample for the study comprised of 110 families in the rural areas of Edava chemmaruthy, Ayiroor, and vettor villages in Varkala Taluk. The sample was selected by random sampling technique. The survey was conducted with the questionnaire prepared by the investigator to collect information related to the educational and financial details of the rural families.

The data was collected with the help of student teachers from Mathematics Optional

subject in Sree Narayana Training College, Nedunganda. The investigator along with the student teachers visited families in the rural areas selected from the Varkala Taluk. Each student teacher collected information from 10 rural families. The data was collected with the questionnaire prepared by the investigator. The student teachers collected information and completed the questionnaire by interacting with the member/members in the selected sample personally.

Analysis and Interpretation of the Data Collected

The data collected were analysed and the following results were obtained.

1. To find the educational level of rural families in Varkala Taluk

In order to find the educational level of the people in the rural areas in Varkala Taluk, the investigator collected information regarding the education level of each member in the family. For the present study, the investigator defined the members in the family as father, mother and two children, if more than two children are there in the family, the investigator selected the elder two children as the two children in the family. The educational level of the child is taken as the average of the educational level of the two children. The data obtained in connection with the education level of the family members are given in the following table.

Table 1: Education level of the members in the rural families in Varkala Taluk

Education level ↓	member In %	Father	Mother	Child
Illiterate		9	8	2
Primary level		23	27	23
Upper Primary		25	35	32
High school level but failed in SSLC		29	25	25
SSLC		12	11	18
Above SSLC		2	4	10

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From the above table it is seen that 9% fathers in the rural areas of Varkala Taluk are illiterate, 23% of them have primary education, 25 % have upper primary education, 12% are SSLC passed and only 2% have higher education. For mothers, the condition is almost the same. 8% mothers in the rural areas are illiterate, 25% are having primary education 30% and 25% respectively have secondary and secondary education and only 4% of them are having higher education than SSLC.

The education level of the children in the rural areas is much better to their parents. Only 2% of the children are illiterate, 23% of the children have primary education, 32% and 25% respectively have upper primary and secondary education, 18% have SSLC and 10 % have higher education to SSLC. This shows as the time passes, the education level increases. Also the illiterate children are very less among the rural population.

To find the number of families having at least one child with educational qualification SSLC or above in the rural families in Varkala Taluk

In order to find the number of families having at least one child with educational qualification SSLC or above in the rural families in Varkala Taluk, Investigator collected the education level of each child in the families. The details of the data collected are given in the following table.

Table:2: Percentage of families having at least one child with educational qualification SSLC or above with caste

Caste	No: of families having at least one children with educational qualification SSLC or above in percentage
FC	78
O.B.C	70
SC/ST	15

From the data collected, It is observed that about 80% and 70% respectively of the forward class and other backward class families in the rural areas of Varkala Taluk are having at least one child with educational qualification SSLC or above and for SC/ST It was below 15 percent . This shows that the educational level of the SC/ST families is still poor in the rural areas.

The nature of financial management of rural families in Varkala Taluk
 In order to find the nature of financial management of the families in the rural areas of Varkala Taluk, the Investigator found the person responsible for managing the income and expenditure of the family, the satisfaction about the financial management among the members in the family and their saving schemes. The details about these are given below.

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This table shows that majority of backward SC/ST people lacks the knowledge about savings schemes and only very little people have some kind of preplanned savings. About 80% of the SC/ST people are not members of any savings schemes. These people spend their money by keeping it in their hand and spend till it needs. And of they have no money in their hand, they will either take the same from others or took the same from others or they lay in starvation on those days.

Table : 6: Details of the finance generator in a family

Income Generator	No of families	No of families in %
Father alone / only one member	26	24
Father and mother together/two members	52	47
Father mother and one child/three members	22	20
Father, mother and two children/four members	10	9
Total	110	100

From the above table it is clear that in the rural areas of Varkala Taluk, women are income generating members along with their husbands. that is, in $47+20=67\%$ families women are also income generating person along with their husbands. This shows the social advancement and the women empowerment of the area..

To know the financial level of the rural families in Varkala Taluk

In order to find the financial level of the families in the rural areas, the investigator collected information regarding the average income of the family as a whole. For the present study, the investigator defined income of the family as the total income of the father and mother and children. If more than two children are there in the family, the investigator selected the elder two children as the two children in the family. The data obtained in connection with the education level of the family members are given in the following table. The investigator also found the earning member of the family.

The details of income of the family obtained is given in the table given below

Table : 7: Financial status of Rural Families in Varkala Taluk

Income Slab in Rs	Number of Families	Percentage of families
<5000	8	7
5000-10000	28	25
10,000-15,000	30	27
15,000-20,000	24	22
20,000-25,000	15	14
Above 25,000	5	5
Total	110	100

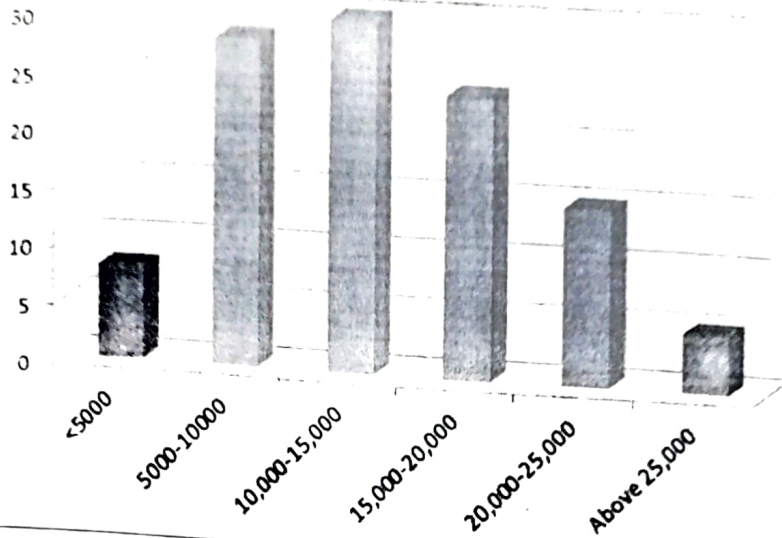
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financial status of families



From the above table, it is clear that out of the 110 families, 7% families are having the monthly income less than Rs 5000/- , 25% families have monthly income between 5000 and 10000, 27% families have monthly income between 10,000 and 15000, 22% families have monthly income in the range 15,000-20,000 and the next 14% families have monthly income between 20,000 and 25,000 and only 4% of the families have monthly above 25,000/- rupees

i. There exists a positive and significant relation between educational level and the financial management of families in the rural areas of and financial management of families in the rural areas of Varkala Taluk

In order to find the relation between the education status and financial management of the families in the rural areas of Varkala Taluk, the investigator found the educational status and the financial management level of the families in the sample (Here, the family is considered as a four member family-father, mother and two children.). The educational status of a family was calculated by adding the educational level of each member in the family.

The relation between the education level and financial management status of the families in the rural areas was calculated using Karl Pearson's Product Moment Coefficient of Correlation and is given in the following table.

Table 8: Correlation between educational level and financial status of families

Variables	sample	r value
Educational level	110	0.765
Financial status	110	

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The relationship between the variables educational level and financial status of families in the rural areas of Thiruvananthapuram is found to be 0.765 which is positive and significant at 0.01 level. It shows that increase in educational level brings a corresponding increase in the financial management status of the family. That is for having a society with better financial management the rural family, the education level of the family is to be improved.

CONCLUSIONS AND SUGGESTIONS

- The educational level of the children are better than their parents
- Education of the SC/ST category children is still poor
- The problem of financial management among the forward and OBC class are not so crucial.
- The financial management of SC/ST families is very poor. Hence something should be done to improve their financial management.
- The SC/ST families should be made to understand the importance of planning in financial management.
- The SC/ST families should be familiarised with the different savings schemes and advantages.
- The SC/ST families will be forced to become a member in some savings schemes and made them experiences its advantage.
- A very good majority of families have average financial status.
- There is a positive correlation between the education level and financial status of families.
- Through this study the researcher arrived at the picture of educational and financial level of the rural families in the rural areas. The education level of the rural mass is increasing which is a positive sign to the development of the rural population. A drastic change has happened in the educational level of the forward and other backward classes. But some more attention is necessary for the educational and financial development of the rural SC/ST population. The backward class families should be made to understand the importance of planning in financial management. These families should be familiarised with the different savings schemes and their advantages. They will be forced to become member of some savings schemes and help them experience with its advantages. Thus, the authorities should be given more importance especially in the area of educational development of the children in the backward classes.

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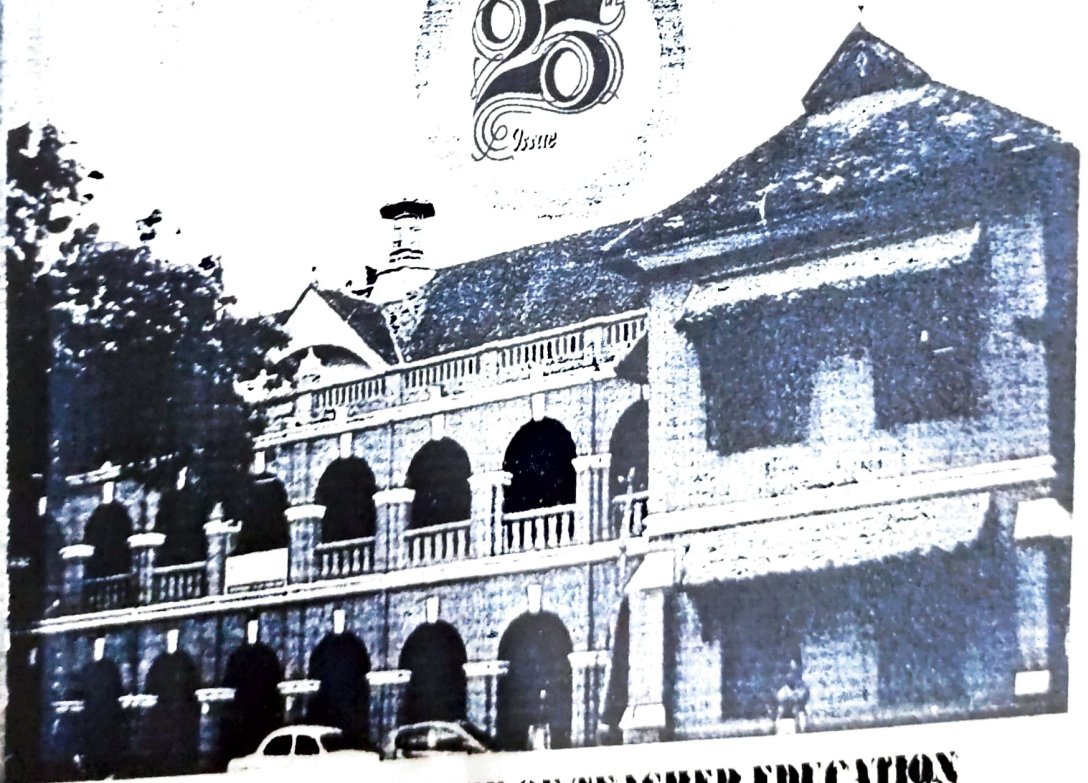
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DEPENDENCY OF QUALITY OF INSTRUCTIONAL PERFORMANCE WITH EMOTIONAL INTELLIGENCE OF SECONDARY SCHOOL TEACHERS IN KERALA

SHEEBA P

Teaching has become quite challenging and only those teachers who are having psychological potentials can shoulder the proactive responsibilities of developing global competitive human resources. Teacher's instructional performance is very crucial in moulding a generation with the necessary 'skills'. Quality of instructional performance is a key concept that needs to be seriously researched considering its relevance in the present educational scenario. The present attempt is to study the dependency of the quality of instructional performance with the emotional intelligence of secondary school teachers. Sample consisted of 222 secondary school teachers from the state syllabus schools in Kerala selected by the stratified sampling technique. The major finding of the study is that the Quality of Instructional Performance is significantly dependent on all the independent variables, viz. Emotional Intelligence and its five dimensions- Intrapersonal EI, Interpersonal EI, Stress Management, Adaptability and General Mood, at 0.01 level of significance.

Education is the most powerful instrument for social progress. It is the greatest power yet known to man for self improvement. Education helps in the development of an individual's cognitive, affective and psychomotor abilities. Education, viewed from a social system perspective, comprises three main elements - teachers,

students and curriculum. The teacher is the basic element affecting the educational process more than the other two elements. Among all educational resources, teachers' abilities are especially crucial contributors to students' learning (Branstord, Hammond and Page, 2005). The Secondary Education


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Commission says. 'We are, however convinced that the most important factor in the contemplated educational reconstruction is the teacher - his personal qualities, his educational qualifications, his professional training and the place that he occupied in the school as well as in the community. Effective teaching and managing requires emotional sensitivity on the part of the teacher; sensitivity to the emotional status and image of the learners and consciousness of his/her emotional status and needs. The ongoing professional growth of teachers largely depends on their instructional performance and emotional balance. Unless we bring quality into the teacher, we cannot expect innovation or change in the quality of the product, which is education. The qualities of teachers include all the personality dimensions of a teacher, i.e., span of knowledge, teaching skills and teacher behaviour, which includes his/her emotional intelligence.'

It has already been accepted that we know remarkably little about the human brain in comparison with what we do not know about it. The layman thinks that he who uses the brain in a productive way alone can truly 'benefit' from the brain. The idea of IQ hardly justifies the multifaceted nature of intelligence. Studies as those of Pachauri (1983) and Saluja & Singh (2009) have established that IQ has the least power in predicting the success

in life and that, very often, it is the experiences that will factor decisively in the successful handling of life situations. In other words, EQ will be more important than IQ. Coleman (1995) theorised that Emotional Intelligence is equal to, if not more important than IQ as an important indicator of success in one's professional and personal life.

Positive attitude towards teaching has been recognised as an important characteristic of an effective teacher (Mann, 1980). For working satisfactorily, the teachers should know how to solve problems, how to manage stress and conflicts and how to contribute with full potential towards institutional goals as well as towards the welfare of the society and the nation at large. This is possible when the teachers have a well-nourished affective domain. Here comes the role of emotional intelligence. A teacher is more productive if he/she possesses better emotional intelligence.

A closer analysis of the studies reviewed in the area of Emotional Intelligence and Quality of Instructional Performance revealed that not much has been done linking these two variables. This observation had motivated the investigator who is a teacher educator to take up a study to fill up this gap. The investigator is fully aware of the importance and relevance of these variables in the field of education, especially in the current psycho-political context. Hence she


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To explore in detail the role of Emotional Intelligence of secondary school teachers on the Quality of their Instructional Performance and as a result the study took shape.

OBJECTIVES OF THE STUDY

To study whether the Quality of Instructional Performance of secondary school teachers is dependent on Emotional Intelligence.

To study whether the Quality of Instructional Performance of secondary school teachers is dependent on each of the dimensions of Emotional Intelligence.

HYPOTHESES

Quality of Instructional Performance of secondary school teachers is dependent on Emotional Intelligence.

Quality of Instructional Performance of secondary school teachers is dependent on each of the dimensions of Emotional Intelligence.

METHODOLOGY

Survey method was adopted for the study. Two hundred and twenty two secondary school teachers from 29 schools belonging to the three regions of Kollam, Cochin and Malabar of Kerala were drawn by stratified sampling technique formed the sample for the study.

The data necessary for the conduct of the study was collected using the following tools:

1. Bar-On EQ-i [Bar-On (1997) (adapted)]
2. Quality of Instructional Performance - Classroom Observation Schedule (Theresa Susan & Sheeba, 2006)

The statistical techniques used in the analysis of the data is the Chi-square test of independence.

ANALYSIS AND INTERPRETATION

In the present study, the investigator finds the dependency of the variable Quality of Instructional Performance with Emotional Intelligence.

Hence, the investigator studied whether the dependent variable Quality of Instructional Performance is associated with the independent variable Emotional Intelligence and its dimensions. The chi-square test of independence was used to test the association between Emotional Intelligence and its dimensions and the Quality of Instructional Performance.

In this study, the analysis is done with the standardized T-scores of both the variables- Quality of Instructional Performance and Emotional Intelligence (and its dimensions) for the total sample and subsamples. For both the variables the standardized scores were obtained by taking mean 100 and standard deviation 15.

Dependency of Quality of Instructional Performance with Emotional Intelligence (for the Total Sample)

The chi square test of independence was used to test the dependency of Emotional Intelligence with Quality of Instructional Performance. The input data for finding the chi-square values

was in the form of a cross tab table in which the variable Emotional Intelligence was classified into categories viz. Low, Average and High and Quality of Instructional Performance was classified into three groups viz. High, Average and Low. The results obtained are given in the following table.

Table 1 - Dependency of Emotional Intelligence with Quality of Instructional Performance Crosstab

Variable		Quality of Instructional Performance			Total
		Low	Average	High	
Emotional Intelligence	Low	63 74.1%	8 9.4%	14 16.5%	85 100.0%
	Average	14 28.6%	25 51.0%	10 20.4%	49 100.0%
	High	14 15.9%	11 12.5%	63 71.6%	88 100.0%
Total		91 41.0%	44 19.8%	87 39.2%	222 100.0%

The above table suggests that when the Emotional Intelligence is low, the chance of Quality of Instructional Performance is also low. It can be seen that 74.1% of the teachers whose Emotional Intelligence is low is having low Quality of Instructional Performance. 51% teachers whose Emotional Intelligence is average, their Quality of Instructional Performance is also average. 71.6% teachers are there with Emotional Intelligence and Quality of Instructional Performance High. Thus, it is found that Quality of Instructional Performance goes with Emotional Intelligence.

Further, by the chi square test of independence suggests that the variables are highly dependent as a chi-square value is 108.4 which exceeds the chi-square value required for significance beyond 0.01 level of significance.

Dependency of Quality of Instructional Performance with five dimensions of Emotional Intelligence

The chi square test of independence was used to find the dependency of each of the five dimensions of Emotional Intelligence

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Quality of Instructional Performance with Emotional Intelligence of Secondary School Teachers - Level

Instructional Performance. The results thus obtained are consolidated in the following table

Consolidated Results of c2 Test of Independence between Quality of Instructional Performance and Emotional Intelligence and its Dimensions

Variable	Contingency table	df	χ^2 Value
Emotional Intelligence	3x3	4	108.4**
Intrapersonal EI	3x3	4	95.11**
Interpersonal EI	3x3	4	50.21**
Stress Management	3x3	4	28.42**
Adaptability	3x3	4	72.92**
General Mood	3x3	4	60.27**

at 0.01 level

chi-square test of independence that Quality of Instructional Performance of secondary school teachers is dependent on all the independent variables, Emotional Intelligence and its five dimensions, of Quality of Instructional Performance is dependent on all the independent variables, viz., Emotional Intelligence, Intrapersonal EI, Interpersonal EI, Stress Management, Adaptability and General Mood, are significant at 0.01 level of significance.

- 1) Emotional Intelligence
 $c2 = 108.4; p < 0.01$
- 2) Intrapersonal EI
 $c2 = 95.11; p < 0.01$
- 3) Interpersonal EI
 $c2 = 50.212; p < 0.01$
- 4) Stress Management EI
 $c2 = 28.42; p < 0.01$
- 5) Adaptability EI
 $c2 = 72.92; p < 0.01$
- 6) General Mood
 $c2 = 60.27; p < 0.01$

This shows that the Quality of Instructional Performance of secondary school teachers is dependent on their Emotional Intelligence and its five dimensions viz. Intrapersonal EI, Interpersonal EI, Stress Management EI, Adaptability EI and General Mood EI. Thus the study points out the need for including feasible strategies for enhancing Emotional Intelligence of secondary school teachers through in-service training. Also, it is desirable

FINDINGS AND CONCLUSIONS

In the chi-square test of independence was done for testing the dependence of Quality of Instructional Performance with the independent variable EI and its dimensions, it was found that: Quality of Instructional Performance is significantly associated with each of the variables

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of the aspects discussed in the study. Quality of Instructional Performance and Emotional Intelligence be given more stress in pre-service teacher education programme. Though the concept of Emotional Intelligence has gained acceptance, it is still not recognised as an essential ingredient of quality of instructional performance in teacher preparation programmes. It is to be borne in mind that 'training the trainer' is important in this regard. That is, teacher educators must be given adequate training on the various techniques that can be used for enhancing the Emotional Intelligence of student teachers. A person with finely tuned emotional intelligence will render good quality instructional performance as established through the study. Hence, the study implies the strategic measures for Emotional Intelligence training to the curriculum designers of pre-service teacher education programmes are many.

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Academic Achievement of Secondary School students in Relation to their Self Esteem

Sheeba P *

ABSTRACT

Education is a process, wherein knowledge is not an end in itself, but a means to promote general welfare. Education plays an important role in moulding the character and personality of an individual. Education is about learning to learn. Indeed we live in a world where change is everywhere and constant learning is essential. Academic achievement is considered to be a composite criterion and not a unitary one. Self-esteem is said to be a vital factor which influences the achievement of school students. The self is what we know about ourselves, and self esteem is how we feel about ourselves. In this study, an attempt was made to find out the relationship between self-esteem and academic achievement among secondary school students. Two hundred secondary school students belonging to general education stream from Thiruvananthapuram district in Kerala were selected as sample. The percentage of marks scored by the students in the year end examination has been used as the pupils' academic achievement score. Adapted form of Coopersmith's Short Version of Self-esteem Inventory (general Factor) was used to measure the self esteem of students. To analyse the data, Pearson's Product Moment Correlation "r" and 't' ratio were used. It is concluded that the academic achievement and self-esteem are found to be positively and significantly correlated.

Keywords: academic achievement, self esteem

Education is a dynamic process, which involves imparting knowledge, generating interest and curiosity, inculcating desirable attitudes and values and developing essential skills required for independent study. This is necessary for enabling students to be competent and socially useful citizens. The unique responsibility of the school is to impart and help children in the acquisition of scholastic skills. Of the several factors influencing academic achievement, self-esteem may be said to play a dominant role in the achievement of school students. According to Corsini (1987), self-esteem is the way one feels about oneself, including the degree to which one processes self-respect and self-acceptance. Self, Self-concept, and self-esteem – each term refers to a particular component of a person's total personality. Self-esteem refers to the extent to which we admire or value the self. The main purpose of all human activity is to enhance self-esteem. Persons with high self-esteem consider themselves to be valuable and they are quite bold and venture to do something new or different. Children with self-esteem have been found to be making greater effort for academic performance (Coopersmith, 1967)

SELF ESTEEM

Self-esteem is an individual's subjective evaluation of their own worth. Self-esteem encompasses beliefs about oneself (for example, "I am unloved", "I am worthy") as well as emotional states, such as despair, pride, and shame. Smith and Mackie (2007) defined it by saying "The self-concept is

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what we think about the self, self-esteem, is the positive or negative evaluations of the self, as in how we feel about it.

One is known as "I" self and the other is known as "me" self. In the middle of 1960 the social psychologist, Rosenberg (2015) mention self-esteem as an attitude which could be favourable or unfavourable towards his own self. Self-esteem includes the behavioural and cognitive aspects of the self or it is the overall reading of a self and making of self-worth. It is your own worth which could be evaluated subjectively and it consists of beliefs about your own self as well as the emotional levels.

In 20th century the studies were done in terms of introspection of mental processes, feelings, emotions etc. Self-esteem predicts academic achievement, confidence level, job performance and satisfaction in relationships and in marriages. It improves ones belief in one self. According to Smith and Mackie (2014) defines it as "The self-concept is what we think about the self; self-esteem, is the positive or negative evaluations of the self, as in how we feel about it." Self-esteem plays an important role in disorders related to human's psychology. Self-esteem is a basic need of human as it is prerequisite for motivation. It boosts up the morale of human being as it builds up positive self-image and positive attitude. Every human needs respect from others in the form of admiration or love. S

Self-esteem could be higher and lower. High self-esteem people enjoy doing multiple activities in their daily life. They are full of positivity and enthusiasm. They work to find solutions to their problems and take challenges in their life positively. Hence, they are open to change and accept themselves as they are and they do not suffer from any inferiority complex. On the other hand, people with low self-esteem are envious, low in confidence, do not believe in them and are resistance to change.

Academic Achievement

Academic achievement is the attainment of a student which he earns in his educational journey. In general sense, it is the current level of learning of a student. Successful completion of a class or diploma gives a student his academic performance and it depicts present learning outcome of a student.

According to Crow and Crow (1969), "Academic achievement" means the extent to which the learner is profiting from instruction in the given area of learning. Achievement is reflected by the extent to which skill of knowledge has been acquired by a person through the training imparted to him". So, it can be said that it is the total of information which is achieved from his completion of course or instruction for a particular grade achieved on an achievement test. To be more specific academic achievement refers to the marks or grades of a student at a school.

A good education system provides student basic knowledge and learning skills to all the students regardless of their age, sex, class, caste, religion or region. It helps us to know the student's performance and the challenges which he is facing during his educational course. It is done so that meaningful solutions can be provided to the hardships and challenges he is facing while the course of learning. It focuses on academic and co-curricular activities in an educational environment. It works on cognitive domain of students.

Academic achievement of a student decides whether he can be promoted for further higher education or not. Teacher or an educational institution helps to achieve long term or short term educational goal of a student. Completion of academic course or bachelor's degree represents academic achievement. The learners are placed in similar situations but in spite that their academic achievement varies. It is due to the fact that there exists number of factors which are operating inside or outside an individual. These factors may be categorized into many three categories: environmental, emotional and intellectual. Singh, D. S. (2016). A school system helps the student to achieve cognitive goals that applies in multiple subject areas or acquiring knowledge or understanding of an intellectual domain. It also includes co-curricular activities performed by the student. It is measured by Grade

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from Average or through Scholastic Assessment Test which determines whether the pupil is eligible to continue his higher studies. Even the society can be called learned if the child or the youngsters adhere to achieve and improve their intellect by working hard for their studies. Hence, academic achievement promotes in the wealth and prosperity of a nation

Objectives

1. To compare the academic achievement of secondary students with respect to gender
2. To find out the difference, if any, in self-esteem scores of boys and girls students of private and government schools; and students of rural and urban schools
3. To find out the relationship between academic achievement and self este

Hypotheses

1. The academic achievement of secondary school students differ significantly with respect to gender.
2. Boys and girls, students of private and government schools and students of rural and urban schools significantly differ in their mean self-esteem scores.
3. There is a positive significant relationship between academic achievement and self-esteem

METHODOLOGY

Method and Sample

The study was conducted in Trivandrum District and the descriptive survey method was employed. Out of the population 200 students belonging to the general education stream were selected as sample. For the selection of sample, proportionate stratified random sampling technique was adopted

Procedure

The percentage scores of the students in the year end examination have been used as the pupils' academic achievement score. Adapted version of Coopersmith's Short Version Self-esteem Inventory (1967) (General factor) was used to measure the self-esteem of the students.

Statistical Techniques Used

The significance of the difference in self-esteem between the different groups was found by applying the 't' test. Pearson Product Moment Correlation Co-efficient was computed for finding the relationship between academic achievement and self-esteem.

Analysis and Interpretation

The arithmetic mean and standard deviations for the boys and girls with respect to the variable academic achievement was calculated and the result is given below.

Table 1: t- Value of boys and girls w.r.t. academic achievement

No.	gender	N	Mean	S.D	t-value	Level of sign.
1	Boys	100	23.51	3.62	7.34	0.01
2	Girls	100	27.33	3.78		

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From the table we can conclude that there is significant difference between the scores of academic achievement between the boys and girls. Since the scores of girls is higher than that of the boys we can say that girls achievement is more the boys' Achievement.

The self-esteem scores of boys and girls were analysed and the details are given in Table 2

Table -2: 't' value for the self-esteem mean scores of boys and girls

Sl.No.	Gender	N	M	S.D	t-value	Level of Significance.
1	Boys	100	10.03	2.93	3.88	0.01
2	Girls	100	11.22	3.01		

It is evident from Table 2 that there is significant difference between boys and girls in respect of their self-esteem scores. Girls have secured a greater mean value than boys in self-esteem.

The self-esteem scores of the students of the government and private schools were analysed and the details are given in Table3:

Table -3 t' value for the self-esteem means cores of government and private school students

Sl.No.	Management	N	M	S.D	t-value	Level of sign.
1	Government School Students	100	10.62	3.11	5.16	0.01
2	Private School Students	100	12.8	3.15		

Table 3 indicates that there is significant difference between the students of government and private schools in respect of their self-esteem scores. The students of private schools have secured greater mean scores than the government school students.

The self-esteem scores of the students of rural and urban schools were analysed and the details are given in Table 4

Table - 4: "t' value for the self-esteem mean scores of rural and urban school students

Sl.No.	location	N	M	S.D	t-value	Level of Sign.
1.	Rural School Students	100	9.80	3.95	5.19	0.01
2.	Urban School Students	100	12.24	2.64		

It is referred that the students of rural and urban schools differ significantly in their self-esteem scores. Urban school students have secured a greater mean value than their rural counterparts.

Correlation Analysis

The academic achievement scores and self-esteem scores were correlated and the results are presented in Table 5.

Table 5: Correlation co-efficient for academic achievement and self-esteem

Sl.No.	Variable	N	r
1	Academic Achievement	200	852
2	Self-esteem		

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The correlation analysis reveals that a high positive and significant relationship exists between academic achievement and self-esteem.

CONCLUSION

- (a) The academic achievement of girls' students is comparatively higher than that of the boys
- (b) Girls seem to have comparatively higher self-esteem than boys
- (c) Students belonging to private schools have a higher self-esteem than those of government schools.
- (d) Urban school students have higher self-esteem than rural school students
- (e) Academic achievement and self-esteem are found to be positively and significantly related.

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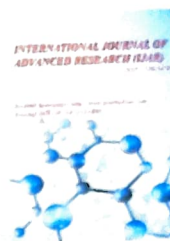




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**RESEARCH ARTICLE**

**EMPOWERING TRIBAL POPULATION THROUGH INDIAN INTELLECTUAL TRADITIONS OF
 VEDIC MATHEMATICS.**

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Empowerment, Tribal population, Vedic
 Mathematics

Abstract

Education has been treated as a fundamental human right enshrined in the Universal Declaration of Human Rights and the International Human Rights Covenants, achieving the rights for the basic education, particularly for the underprivileged sections of the society is not only the obligation of the State, but the biggest moral challenge. It is well known that a rapid growth in educational attainment is the most successful medium for social empowerment of the disadvantaged ST & SC members. The present paper tries to empower the Tribal students by enhancing their Problem Solving Ability and Computational Speed and thereby the Self Confidence through the applications of Indian Intellectual traditions of Vedic Mathematics.

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Introduction:-

The constitution of India, in Article 366, has defined the Scheduled Tribes as such of those tribes or tribal communities which have been so declared by the Constitution Order under Article 342 for the purpose of Constitution. There are 574 tribal groups who have been identified as Scheduled Tribe. Lack of education of tribes has inevitably linked it to their poor economic condition and poverty. As per the 2011-'12 census, ST students constitute 1.86% of total enrolment in schools in the year 2011-12. The percentage of ST students in government schools, private aided schools and private unaided schools are 3.37%, 1.33% and 0.37% respectively in 2011-12. The drop out ratio of ST students was 2.33%. The pass percentage of SC students also increased from 50.80% to 60.46% and ST students from 41.16% to 52.31% during 2010-11. 2882 Scheduled Tribe students were enrolled for courses in arts and science colleges in 2010-11. The enrolment of ST students in degree and post graduate courses are 2528 and 354 respectively. Girls constitute 60% of total ST students in Arts and Science colleges.

Tribes and their Education:-

"A tribe is a social group with territorial affiliation, endogamous, with no specialization of functions, ruled by tribal officers, hereditary or otherwise, united in language or dialect, recognizing social distance with other tribes or castes, without any social obloquy attaching to them, as it does in the caste structure, followed tribal traditions, beliefs and customs, illiberal of naturalization of ideas from alien sources, above all conscious of homogeneity of ethnic and territorial integration." (DN Majumdar quoted in Hasnain, 1998:4) In the education sector the literacy rate among tribes is very low and the majority children continue to be outside the school system. The Government introduced special educational support to the tribes. Special norms and flexible approaches introduced. But the number of the out of school children is large. Here also the number of enrollment among tribes is very low and the dropout rate is very high. There are number of reasons behind this, like lack of parental support and interest, inability to understand the medium of instruction due to mother to inhibition, lack of schools nearby, teacher

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absenteeism attitude towards girls etc. In formulating policies and programmes for tribal education it is essential to understand the complex realities of tribal life and the expectation of tribes from the system.

Problems of Education of Tribal People:-

Government planners see education as indispensable for helping tribal peoples cope with national integration. Education will also determine their prosperity, success and security in life. The tribes which remain either deprived of or negligent toward education will suffer the consequence. Government reports indicate that there is no scarcity of schools, other facilities or scholarships for the implementation of tribal education schemes. Even though the tribes are living away from so called civilized society, the globalized changes reflect in their life too not in a profitable way but in an undesirable mode. At present the indicators of socio- economic development is high in Kerala but it doesn't reflect in tribal life. Their life is in the transforming state losing their identity. There are a lot of issues that the tribal face today, it can be poor academic standard, sexual abuse, alcohol and drug addiction, violence etc. these all issues make them unable to apply their complete potential. These tribal youth often lacks a real role model from their community. The dropout rate of tribal students is high compared to other section students. Since the tribal children are rehabilitated to new system of learning it is very difficult for them to adapt the system of learning that our education system is following. They do have their own practical skills. But those skills are not sufficient for them when they face the reality in the society.

Need for Empowerment:-

Tribal students, even while they study at the secondary and college levels, should, be encouraged to come out with self-confidence. For that they should become aware and conscious of their innate capacities. Their hidden talents are to be nourished out. They should be well trained in the acquisition of various skills which are essential for self-sufficiency. Development in tribal societies should focus on educational programs that encourage keeping tribal youth genuinely integrated in their own culture. Empirical evidences (Dube, 1977; Sujatha, 1999) reveal that tribal children possess the basic cognitive abilities and psychological dispositions for successful participation in schools but there is no sufficient intrinsic and extrinsic motivation to achieve the academic goals. Sachidananda (1996) explained that lack of ambition and unfavorable attitude towards education were the main reasons for the failure of tribal children. It can be gratified that there is a slight increase in the field of tribal education as a result of implementing different new strategies by the government.

Vedic Mathematics, A Suitable Strategy for Confidence Building:-

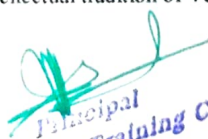
Vedic Mathematics offers a new approach to resolving the current crisis in education (Puri&Weinless, 1988; Puri, 1988).It is not simply a collection of new computational techniques; rather, it provides an entirely different approach to mathematical computation, based on pattern recognition (Puri, 1991). It has since been shown that the system is equally applicable to more up-to-date aspects of mathematics both at an elementary level as well as in more sophisticated fields (Nicholas, Williams, & Pickles, 1984). The reason that this is possible relies on the nature of the sutras. They frequently describe how the mind approaches, or deals with, a problem in the earliest way (Puri&Weinless, 1988). The Vedic system teaches this sort of approach systematically rather than leaving it to chance and hence we find a number of different possible methods for any particular sum. This is of tremendous use because it enhances variety of strategy. It also enables the subject to be kept alive by directing the attention towards underlying pattern and relationship (Stoddard, 1962; Starkey &Gelman, 1982).It is a system with mental multi choice procedures, which keep the mind alert and agile. It is a complete and most natural Vedic System, which develop our brain to wonderful levels (Reyes, 1984). Puri points out that the naturalness and ease of Vedic Sutra based computation "brings smiles on the face and joy in the heart" of the students which bring mental strength and confidence (Puri, 1986). Further, Vedic Mathematics reduces anxiety and increases playfulness.

This spark tempted the investigator to implement Vedic computational strategies in improving computational speed and problem solving ability of tribal students and thereby build up confidence upon them.

Objectives of the study:-

The study was conducted among a population of tribal children. The present study was undertaken with the following objectives:

1. To test the effectiveness of the Supreme power of Vedic Mathematics in enhancing Problem Solving Ability and Computational Speed of tribal children.
2. To equip the tribal children with self-confidence by attaining skills of Problem Solving Ability and Computational Speed through Indian intellectual tradition of Vedic Mathematics


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Hypotheses of the study:-

The following **hypotheses** were formulated by the investigator to lead the study

1. Vedic Mathematics applications are very much effective in enhancing Problem Solving Ability and Computational Speed of tribal children.
2. Acquisition of the skills of Vedic Mathematics applications is the true solution in equipping tribal children with self-confidence.

Methodology:-**Population and profile of the sample:-**

In this study, the researcher made an attempt to enhance the Problem Solving Ability and Computational Speed of tribal children and thereby increase their Self-Confidence. The sample selected were 40 tribal students of Kerala with special reference to Kollam District. The samples were secondary school students selected using random sampling technique.

Design, participants and procedure:-

The design selected for the study was Pre-test Post-test Single group design. A package of select Vedic Sutras with 'EkadhikenaPurvena', EkanyunenaPurvena and UrdhvaTiryagbhyam, pre-tested Problem Solving Ability Test, Computational speed test, and a Self-Esteem Scale prepared by National Center for Injury Prevention and Control were the tools. Before the intervention, a pre-test was conducted among the students. At the end, Post-Test was administered and the scores were collected. After an interval of 1 month, a retention test was given without any notice. The same tools were used for administering the retention test. Appropriate statistical technique like Repeated ANOVA, LSD test of post hoc comparison were used for testing the impact of Vedic sutras in attaining pre-determined objectives and interpreted accordingly.

Data Analysis:-

Table 1:- Mean values and Standard Deviations of Problem Solving Ability scores in pre, post and retention tests of tribal students in experimental group

Group	N	Mean	SD
Pre Experimental	40	7.21	2.59
Post Experimental	40	18.10	1.51
Retention Experimental	40	17.68	1.68

Table 2:- Summary of Repeated ANOVA of Problem Solving Ability scores in pre, post and retention tests of tribal students in experimental group

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	9183.07	1	4591.54	1352.00**
	Between Subjects	598.00	39		
	Error	808.26	78	3.40	
	Total	10589.33	138		

**Significant at 0.01 level

Table 3:- Results of LSD Test for significance between pairs of mean scores of Problem solving ability of tribal students of the experimental group

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental	7.21	10.89**
	Post-Experimental	18.10	
2	Pre-Experimental	7.21	10.47**
	Retention Experimental	17.68	
3	Post-Experimental	18.10	0.42**
	Retention Experimental	17.68	

** Significant at 0.01 level

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Table 4:- Mean values and Standard Deviations of computational speed scores in pre, post and retention tests of tribal students in experimental group

Group	N	Mean	SD
Pre Experimental	40	18.71	3.48
Post Experimental	40	9.10	0.88
Retention Experimental	40	9.80	0.18

Table 5:- Summary of Repeated ANOVA of Computational Speed scores in pre, post and retention tests of tribal students in experimental group

Group	Source of variation	Sum of Squares	df	Mean squares	F-ratio
Experimental	Between Groups	6213.94	1	3106.97	716.95**
	Between Subjects	510.20	39		
	Error	1031.39	78	4.33	
	Total	7755.53	138		

**Significant at 0.01 level

Table 6:- Results of LSD Test for significance between pairs of mean scores of Computational Speed Test of tribal students in experimental group

Sl No	Pairs	Mean values	Mean Difference
1	Pre-Experimental	18.71	9.61**
	Post-Experimental	9.10	
2	Pre-Experimental	18.71	8.91**
	Retention Experimental	9.80	
3	Post-Experimental	9.10	0.70**
	Retention Experimental	9.80	

** Significant at 0.01 level

Table 7:- Result of Self Esteem Survey after Intervention

Sr.No.	Items	Strongly Agree	Agree Somewhat	Somewhat Disagree	Disagree Strongly
1.	I feel that I have a number of good qualities.	31	5	4	-
2.	I feel that I'm a person of worth, at least on an equal par with others.	32	6	2	-
3.	All in all, I am inclined to feel that I'm a failure.	-	-	-	40
4.	I am able to do things as well as most other people.	36	3	1	-
5.	I feel I do not have much to be proud of.	-	-	28	22
6.	I take a positive attitude toward myself.	34	4	2	-
7.	On the whole, I am satisfied with myself.	36	3	1	-
8.	I wish I could have more respect for myself.	24	12	2	2
9.	I certainly feel useless at times.	-	-	-	40
10.	At times I think that I am no good at all.	-	-	7	33

Source: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2005).


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When the Pre-Intervention scores were analyzed, the self-esteem rating was very low (below 10). The result here shows that, after the intervention, the rate of self-perception on self-esteem has considerably enhanced which clearly reveals that Vedic Mathematics skill acquisition can enhance the confidence level of the learners.

Discussion:-

When the results of Analysis of Variance of post-test scores on Problem Solving Ability Test and Computational Speed Test of participants were taken, the difference between the means was found to be statistically significant ($F_{(1,39)} = 1352.00$; $p < 0.01$) and ($F_{(1,39)} = 716.95$; $p < 0.01$). The result clearly gives the evidences that Vedic Sutras are very effective in enhancing Problem Solving Ability and Computational Speed among the sample of study. Research on the effects of Vedic Mathematics on improving Computational Speed includes the works by Nicholas, Williams & Pickles (1984), Hope (1987), Muchlman (1994), and Haridas (2004) who concluded that "Vedic Mathematics provides very easy, one line, mental and superfast methods".

Findings:-

1. Vedic Mathematics applications are very much effective in enhancing Problem Solving Ability and Computational Speed of tribal children.
2. Acquisition of the skills of Vedic Mathematics applications is the true solution in equipping tribal children with self-confidence.
3. The continuous practice and application of Vedic One line method of computation indirectly empower the tribal student community in their overall personality development

To empower the children of tribal community, the study throws light on the suggestions that the Regular motivation sessions with the Tribal students, Counseling to the needy children, Life orientation programmes, Leadership and personality development training programmes and Summer Camps focusing on over all development of the tribal children are to be conducted on a regular basis.

Conclusion:-

Each child including tribal-child has the right to free and compulsory education. Indian Constitution guarantees basic rights which are to be protected and promoted. Although the tribal department and Government of Kerala do a number of projects and programmes for the integral development of Tribal children, they face a number of problems with regard to education. They need to be addressed and tackled and thus the dreams of tribal children are fulfilled. It can be summarized that these people need special care and attention in academic part of life otherwise their holistic development is impossible which should not ever happen as our India, the nation which uphold the values of Dharma, the concept of 'Vasudhivakudumbakom' to be achieved even by uplifting the downtrodden.

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Challenges with Teaching in Smart Classrooms

Chitra S *

ABSTRACT

Technology plays a critical role in defining today's educational scene. Smart/high-tech classrooms featuring advanced equipment, such as computers and multi-media projectors, are rapidly becoming the norm in schools. Smart classrooms provide a more engaging and dynamic environment in which to learn. Many schools are supporting higher levels of technology in the classroom by providing tablets and PCs, improving internet connectivity, and creating computer literacy programmes for both instructors and students. Although most instructors recognize the value of instructional technology, they often have difficulty integrating it into their classrooms. The present study is an attempt to analyse the problems of teaching in smart classrooms with special reference to schools in Kerala.

INTRODUCTION

In shaping the educational landscape today, Technology plays a very crucial role. Schools are fast becoming digital with smart/ hi-tech classrooms equipped with advanced gadgets, including laptops and multi-media projectors. As part of the KITE (Kerala Infrastructure and Technology for Education) initiative of the Kerala Government, more than 40,000 classrooms have turned hi-tech. In today's digital world, the students are considered digital natives in digital environment. Huang et al.(2012) defined *smart classroom* as a physical classroom space that was effective for showing teaching content, easy for class management, convenient for accessing learning resources, easy for instructional interaction, and combined with contextual awareness. Smart classrooms provide modern, innovative and interactive teaching and learning environment to enhance the students all round development. Smart classrooms give a better and dynamic ambiance to the student to learn in a smart way. Learning is fun when subjects are interesting, and smart classrooms are doing well in creating interest of a student in the particular subject, which the kid used to hate the most. Many schools are showing support for increased levels of technology in the classroom by providing hardware such as tablets and computers, enhancing internet connectivity, and implementing programs designed to improve computer literacy for both teachers and students. Although teachers generally appreciate the benefits of educational technologies, they often find smooth and effective integration of new educational technologies challenging.

NEED AND SIGNIFICANCE OF THE STUDY

With the support of technologies, the smart classrooms become the places where teachers and students could practice rich and immersive teaching and learning experiences. Government has increased investments in educational technologies, with the assumption that use of technology in schools could enhance teaching and promote learning outcomes. However, we can see the modest use of technologies without significant influence on teaching and learning in most schools and classrooms. Teachers' ability to effectively use these technologies in teaching-learning processes

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may be influenced by a variety of factors, including cost, physical conditions, student perspectives, school management, and instruction. The present study aimed at investigating the problems of teaching in smart classrooms.

STATEMENT OF THE PROBLEM

In this digital era, use of ICT in the classroom is important for giving students opportunities to learn and apply the required 21st century skills. Students today are apt at using technology, and tools such as laptops, smartphones, and tablets are already second nature to them. Taking technology out of the learning equation would be removing an integral part of the students' abilities. In this context studying the issues and challenges related to smart classroom use in teaching and learning can assist teachers in overcoming the obstacles and become successful technology users. Hence the present study is titled as **CHALLENGES WITH TEACHING IN SMART CLASSROOMS**

OBJECTIVES OF THE STUDY

1. To get a general idea regarding the existing conditions in smart classrooms.
2. To analyse the problems faced by teachers in smart classrooms.
3. To suggest solutions to those problems.

METHODOLOGY

Method : For the conduct of the present study Survey method is used.

Sample : Data is collected from a sample of 75 secondary school teachers in Thiruvananthapuram District.

Tool : A questionnaire having 22 items was self developed and finalized by the investigator before being distributed to the targeted group of respondents. The items in the questionnaire were related to the access, training and support regarding the smart classroom facilities.

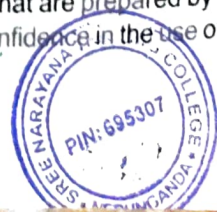
Statistical technique adopted : The data collected from the respondents were gathered together to be analyzed using Percentage analysis.

ANALYSIS

The collected data were analysed making use of percentage analysis. From the data it can be seen that 70% of teachers are of the opinion that there are enough number of smart classrooms in their school. Only 40% of the respondents are satisfied with the available number of computers in their classrooms. It is clear that the lack of proper number of computers deny access to technology in classroom learning. Majority of the teachers find it difficult to manage the time in smart classrooms. Due to the small duration of the periods most of the teachers cannot use the ICT facilities to a great extent. 40% responded positively when they are asked about the availability of connectivity. The network problems in schools acts as major barrier in e-learning. 40% of teachers considered their smart classrooms as technology rich. Since no timely maintenance of equipments in smart classrooms are done, the available facilities were poor in quality quantity. A good number of teachers opined that there is no provision for the students to use the computers individually.

72% of the respondents are of the opinion that they are getting proper training from educational department regarding the teaching in smart classrooms. Only a few percentage of teachers are up-to-date with their technological skills. 57% of teachers are satisfied with their technological skills. All of them are having awareness regarding the educational softwares that are prepared by educational department for teachers and students. Majority of teachers showed confidence in the use of technology

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in classroom. 71% of teachers are ready to use the innovations of technology in their classroom. 75% of the respondents are of the opinion that students can learn with more interest and motivation in smart classrooms. From this data it is evident that majority of the teachers are having a favourable attitude towards the use of smart classrooms.

Majority of the teachers are not satisfied with support they got from the authorities in technology integration in teaching-learning process. 68% agreed to the support given by the school authorities. 50% of teachers are satisfied with the layout of their smart classrooms. 75% consider the experience provided through smart classrooms make the teaching more easier and enjoyable. A good number of teachers are getting proper support from their peer teachers in using the resources in smart classrooms. 61% of the respondents are of the opinion that smart classrooms help in accessing the teaching-learning resources more easily. Most of them are not satisfied with the technical support from the school. In most cases the school authorities neglect the problems in technology integration due to poor funding provisions. 90% of the teachers agreed that there is great pressure to prepare students for examination. 70% of the respondents are of the view that using ICT in teaching and learning is a goal in their school.

MAJOR FINDINGS

The major problems of teaching in smart classrooms include lack of resources, time, access and technical support.

- Most of the schools are having limited accessibility to network connection.
- Limited technical support is provided to teachers
- Lack of effective training contribute to the poor use of smart classrooms.
- The duration of the period acts as a barrier for instructors to integrate technology into existing lesson plans.
- Limitation of infrastructure, such as computer labs lead to ineffectiveness of technology supported teaching and learning.
- Lack of proper funding facilities decreases the quality and quantity of the available IT resources.

SUGGESTIONS

- Proper guidance should be given by the authorities for the professional development of teachers with regard to technology integration.
- Ensure that adequate technical, administrative, and peer support is available to teachers in ICT integration.
- Provide teacher training that highlights the importance and added advantages of smart classrooms.
- Involve teachers in the decision-making process when adopting new technologies.
- Seek proper funding resources for maintain the technologies.

CONCLUSION

Technology has become an integral part of our daily lives. In this digital era, Smart classroom is important for giving students opportunities to learn and apply the required 21st century skills. To meet the needs of the digital natives in the digital environment teachers must be up-to-date in their technological skills and should try to integrate technology in the teaching-learning process to a great extent. Technology integration in the classroom will require the ongoing collaborative efforts of

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teachers, educational technology professionals, school administrators, researchers, and educational software personnel. To sum up, teachers need to get out of the problems in smart classrooms and work towards making education more accessible and feasible to all.

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The Pedagogical Implications of Animation

Chitra S *

ABSTRACT

The present paper discusses the role of animation as a powerful pedagogical tool in education sector. Technological advancements offer exciting new opportunities to educators to provide more engaging and effective teaching resources. Animation as a multimedia tool is at the forefront of the current digital learning environment. With the use of animation in education, there is a significant increase in the attitudes and academic achievements of the students in a positive way. Animation allows for the design of education and training by offering a wider variety of learning processes and richer educational environments for learners. It is undoubtedly an incredible visual stimulant, which helps to visualize even the most complex information by creating a positive eLearning environment for everyone. In this era of digital strategy, a lot of animation is utilized on the internet for educational purposes. The creative potential of animation is enormous, and integrating animation activities into the school curriculum offers the possibility of tapping this potential to meet a wide range of educational objectives. It is found out that animations leave a deep-rooted impression on the malleable intellect of the learners.

Keywords: Animation, Educational Animations


INTRODUCTION

Technology is developing swiftly in the 21st century and these developments are bringing many innovations in education sector as well. The use of technology in education influences learning and teaching environments. Animation as a multimedia tool is at the forefront of the current digital learning environment. It has been suggested that with the use of animation in education, there is a significant increase in the attitudes and academic achievements of the students in a positive way. It has been shown that animations as technological tools used in education have contributed a lot to the students in terms of security, speeding and slowing time, examining very rare events, simplifying complicated systems, being useful and cheap and motivation as well as providing a significant increase in students' attitudes and academic achievements towards the content/courses in positive manner. Animation allows for the design of education and training by offering a wider variety of learning processes and splendid educational environments for learners.

ANIMATION

Animation is a valuable e-Learning tool and a training medium which offers exciting possibilities for meeting the needs of 21st century learners. It is undoubtedly an incredible visual stimulant which helps to visualize even the most complex information by creating a positive eLearning environment for everyone. Animation is a method of photographing successive drawings, models or even puppets, to create an illusion of movement in a sequence. To create the appearance of smooth motion from these drawn, painted, or computer-generated images, frame rate or the number of

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consecutive images that are displayed each second, is considered. Animation enhance student's learning experience, including increased engagement and interest, improved understanding and greater flexibility in self-directed learning. Animation can bring concepts or imaginations to real life through character sketching. Moving characters are usually shot "on twos" which just means, one image is shown for two frames, totaling in at 12 drawings per second. 12 frames per second allows for motion but may look choppy. In the film, a frame rate of 24 frames per second is often used for smooth motion animation. There are several types of animation that employ different techniques to achieve their desired effect.

Different Types of Animation :

- Traditional Animation
- 2D Animation (Vector)
- 3D Animation
- Motion Graphics
- Stop Motion

One of cinema's oldest forms of animation. It's called cell animation, sometimes. Objects Traditional Animation

This is in traditional animation are drawn on transparent celluloid paper. The animator must draw every frame in order to create the animation sequence. Most frequently, Traditional animation is 2D animation.

2D Animation (Vector)

2D animation can fall under traditional animation. But there is something called Vector-based animation that can be 2D and not considered traditional. With Vector-based, the motion here can be controlled by vectors rather than pixels. Images with familiar formats like JPG, GIF, BMP, are pixel images. These images cannot be enlarged or shrunk without affecting image quality. Vector graphics don't need to worry about resolution. Vectors are characterized by pathways with various start and end points, lines connecting these points to build the graphic. Shapes can be created to form a character or other image. Below is an example.

Vector-based animation uses mathematical values to resize images, so motion is smooth. They can re-use these creations so the animator doesn't need to keep drawing the same characters over and over again. You can move around these vectors and animate that way. This is also helpful for animators who aren't the best drawers.

3D Animation

Today, 3D animation or computer animation is the most common type. But just because computers have stepped in instead of actual drawings, it's not necessarily easier. The computer is just another tool, and 3D animation is still a long, intense process.

In 3D animation, the animator uses a programme to move the character's body parts around. They set their digital frames when all of the parts of the character are in the right position. They do this for each frame, and the computer calculates the motion from each frame. Animators adjust and tweak the curvatures and movements their characters make throughout.

3D animation is also unique in that, unlike 2D, or other traditional methods, the character's entire body is always visible. If a character turns to the side, the animator only needs to draw the side profile in 2D animation, but in 3D, the entire body still needs to be visible. So again, even though computers are being used, with new technology comes with way more considerations.

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Whether you're using drawing in 2D or computing in 3D, animators and filmmakers alike look to storyboards to plan out each frame. Unlike live-action, animation movies can't rely on camera tricks in a shot. Storyboards are the lifeline for creating animation.

Motion Graphics

Motion Graphics are pieces of digital graphics that create the illusion of motion usually for ads, title sequences in films, but ultimately exist to communicate something to the viewer. They're often combined with sound for multimedia projects. They're a type of animation used mostly in business, usually with text as a main player.

Stop Motion

Stop motion animation encompasses claymation, pixelation, object-motion, cutout animation, and more. But the basic mechanics are similar to traditional animation or a flipbook. However, instead of drawings, stop motion adjusts physical objects in each frame. If moved in small increments, captured one frame at a time, the illusion of motion is produced. Whether puppets, clay, or even real people, these manual adjustments can make it a long, arduous process.

ANIMATION IN EDUCATION

Animation is an art that plays a very prominent role in the all-expansive tech fairy. In this era of digital strategy, a lot of animation is utilized on the internet for educational purposes.

Young students are fascinated by animation and animated stories and they enjoy the opportunity to create their own. The creative potential of animation is enormous, and integrating animation activities into the school curriculum offers the possibility of tapping this potential to meet a wide range of educational objectives. There are various benefits that animation provides to the teachers and students. It plays a very important role towards the upliftment of educational procedures and enhances the teaching-learning process by achieving the desired educational outcomes.

The educational benefits of animation arise from its capacity to portray temporal change directly and explicitly. Teachers are always looking for better and innovative ways to improve the education techniques for the students. Research suggests children tend to learn better when they are enjoying the study. It's scientifically proven that retention of information is higher when it is communicated using both visual and verbal communication. These attributes allow animation to provide a better match between the way a subject is presented and the needs of the learner.

Animation serves mainly two functions in education. First purpose of animation in academics is to fulfill a cognitive function. In this role, animations are intended to support students' cognitive processes that ultimately result in their understanding the subject matter. Animations that have a cognitive purpose can facilitate learning because they provide more and different information than static graphics. They have the potential to help a learner build a more accurate mental model of a system's behavior compared to graphics alone. Animation can be used to make very exciting and fun animations into which education and training can easily be incorporated. Instructors can also use animation to demonstrate things and concepts visually exactly how they want to since they have control of every aspect of the animation. It can be used to show how things come together and work together. In science for example, the computer animation might be used to show how nuclear fission occurs. Other subjects such as English, Mathematics, music, art etc. can also be taught by using animation. Secondly, as an affective learning tool that attracts attention, engages the learner, and sustains motivation aspect. Such Affective Animation Training is not focused on



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facilitating comprehension of any academic subject matter itself and often portrays activities that are interactive, creative, fun and motivational. Animations that have a cognitive purpose can facilitate learning because they provide more and different information than static graphics. They have the potential to help a learner build a more accurate mental model of a system's behavior compared to graphics alone.

According to Lowe and Schnitz (2014), the following set of principles are to be considered in the design of animation for use in multimedia learning resources.

Principle I: People learn better from an animation when the instructional purpose of the animation has been clearly defined.

Principle II: People learn better from an animation appropriate emphasis is given to spatial versus temporal information.

Principle III: People learn better from an animation when perceptual attributes and cognitive requirements are closely aligned.

Principle VI: People learn better from an animation when perceptual processing and cognitive processing are appropriately supported.

Principle V: People learn better from an animation when interaction and opportunities accord with aims and learner expertise (Mayor, 2014).

BENEFITS OF ANIMATION AS AN EFFECTIVE LEARNING TOOL

- Emphasises development of students' skills and understanding of creating and responding.
- Enables students to apply creativity and critical thinking.
- Enables students to invent and explore multiple solutions to a problem.
- Enables students to understand the value of reflection and critical judgment in creative work.
- Facilitates positive peer interaction, including receiving and using feedback.
- Encourages self-motivation to create and problem solve.
- Uses artistic literacy as a natural enhancement to learning in other content areas.
- Fosters positive attitudes toward Art & Animation.
- Introduces career possibilities.

Advantages for Primary Students

- Ignite the creative potential of students at a young age.
- Perfect introductory tools to learn animation.
- Can be used for presentations/ assignments in science, history, geography, language classes as well as in after school programmes.
- Contribute to increase focus and concentration in class while having fun

Advantages for Secondary Students

- Strengthen students' talent and skill set
- Strong tools to teach foundation of animation
- Promote creativity and motivate students
- Incorporate animation into different subjects to create more engaging presentations
- Develop story telling skills

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Educational Animations

The benefits of incorporating educational animations that enhance the teaching-learning process in schools are manifold. It accelerates the overall expansion of a student's skills, by augmenting their grasping ability and problem-solving. It has also been proven that information received in the audio-visual realm is processed and preserved more effectively by the human brain.

Educational animations visualize the textual materials and assist learners understand complicated or abstract concepts better. An animated cartoon is a film for the cinema, television or computer screen, featuring some kind of story or plot, which is formed exploitation drawings. Earlier Animated Cartoons were meant for the purpose of entertainment only. But in these days they are being extensively used for other functions as well. Animated Cartoons are now being used for education and spreading awareness amongst people in addition to fun and entertainment.

The benefits that can be reaped by inclusion of animation in education are many. Animated educational videos enhance creativity in learners and motivate them to explore complex dimensions of knowledge. The skills set of students gets honed through animated cartoon-based teaching. Presentations can be made more engaging by incorporating animation. Lessons can be narrated in story form which improves comprehension of the contents.

The Figure given below clearly explains the success factors of implementing animation in education

Success factors of implementing Animation in Education

Apply animation principles in learning

- Functions of animation
- Spatial and temporal Information
- Perception and Cognition
- Verbal and Pictorial guidance
- Interactive learning

Build a foundation for learners

- Provide learners with edutainment
- Understand how to use animation in education

Invest in professional development

- Use animation technologies for teacher training programmes

Support from the authorities

- Empower and equip educators to incorporate animation into teaching.

For the effective utilization of animation in education, understanding the students is important. They have grown up with technology surrounding them and it is in fact, an important part of their daily lives. Since students are more accustomed to advanced technology, they expect the use of similar technology in school also. Students these days need tools which support education in a creative interesting manner. It is the duty of the teachers to motivate them to concentrate more in studies and along the way, create a worthwhile experience for them. Teachers should provide them the support and assistance as and when needed.

CONCLUSION

The use of animation in education has revolutionised the way we perceive and understand learning. Animation is a powerful digital tool and can work wonders if used in the right way. Hence,

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teachers and educational institutions should work together and use animation as an innovative tool to provide effective education to the students. They can create and use animated instructional materials keeping in mind that the content should be short, appropriate, and deliver clear message with least effort. Thus animation leaves a deep-rooted impression on the malleable intellect of the learners through its fun, interactive and experience-based learning nature.

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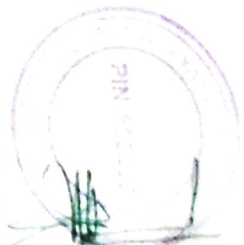
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Effectiveness of Experiential Learning Method in Enhancing Scientific Attitude Among Prospective Teachers

Dr. Reetha Ravi H.* and Ronald Rose S. L.**

ABSTRACT

The present study entitled *Effectiveness of Experiential Learning method in enhancing Scientific Attitude among Prospective teachers* is an attempt to find out the impact of experiential learning as a tool of teaching on improving scientific attitude of prospective teachers. The participants of this study were 60 prospective teachers from teacher education institution in Thiruvananthapuram district, it included rural and urban students with high and low socio-economic levels. The sample was selected randomly and divided in to two groups- experimental and control groups. The researcher selected some science lessons from secondary school syllabus of 10th grade. The experimental group students were taught through the experiential learning method, whereas the control group students were taught by the traditional method. Pre and post - tests were administered to explore the impact of experiential learning in enhancing scientific attitude. The researcher used the statistical techniques, namely descriptive statistics to analyze the collected data and describe the research participants and their level in scientific attitude. This study took 27 working days with 45 minutes a day for each group during the academic year 2018-2019. The results of the study indicated that experiential learning has a significant effect on improving and developing scientific attitude.

Keywords: Experiential learning, Achievement, Prospective teachers.

INTRODUCTION

Experiential learning theory emerged as a result of taking students' individual differences into consideration. Experiential learning is the process of learning through experience, and it is defined as "learning through reflection on doing". It's a learning process initiated by a concrete experience, which demands reflection, review and perspective-taking about the experience; then abstract thinking to reach conclusions and conceptualize the meaning of the experience; leading to a decision to act, engaging in active experimentation or trying out what you've learned. In science teaching Experiential learning plays a prominent role in enhancing scientific literacy among the students. Experiential learning is, quite simply, learning by doing. This type of learning is an active process which engages the learner, not a passive process that happens to the learner. In 'experiential learning' the experience provides the platform for learning, whilst the careful analysis and reflection of the experience develops the learning. Eyler and Giles (1999) noted that "service learning is a form of experiential education where learning occurs through a cycle of action and reflection as students work with others through a process of applying what they are learning to community problems".

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REVIEW OF RELATED LITERATURE

As learning is a lifelong process and individuals need to learn, interpret or judge situations from experience under various conditions, scientific process skills are very important for significant learning (Bilgin, 2006).

Boulding (2000), renowned for her extensive academic work in the study and promotion of peace, has noted the power of experiential education and service learning, in particular in promoting peaceable communities (p. 232).

It is the well-known work of Kolb (1984), however, that really brought experiential learning to the forefront in the educational literature. Kolb postulates, "Learning is the process whereby knowledge is created through the transformation of experience" (p. 38). Kolb theorized that learning takes place when individuals engage in a novel experience, reflect upon it, conceptualize it and then test its authenticity by applying it to similar future experiences. Kolb's theory of learning is particularly interesting, as it integrates learning styles with the cyclical stages of how he proposed experiential learning occurs.

Research suggests that experiential learning can help students develop positive attitudes toward life, encourage acceptance of responsibility, promote community involvement, develop power of thought and help them understand their strengths and weaknesses in a real-world context, thereby inspiring personal growth through the development of global competencies (Eyler & Giles, 1999).

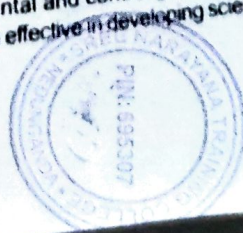
Experiential learning-based education requires activities planned appropriate to all learning ways. In general, concrete experience requires full participation of individuals in the activity, while reflective observation requires individuals to develop various perspectives, abstract conceptualization requires attainment of the theoretical knowledge by the individual and active experimentation requires individuals to implement the knowledge. Implementation of the learning cycle in the classroom environment is essential in realization of effective learning (Bahar & Bilgin, 2003, Svinicki & Dixon, 1987).

OBJECTIVES OF THE STUDY

- To prepare an instructional package making use of experiential learning method for prospective teachers of physical science.
- To compare the means of the pre test scores on scientific attitude of the experimental group with that of control group.
- To compare the means of the post test scores on scientific attitude of the experimental group with that of control group.
- To study the effectiveness of experiential learning method in the development of scientific attitude.

HYPOTHESES OF THE STUDY

- There is significant difference between the mean pre test scores on Scientific attitude of prospective teachers in experimental and control groups.
- There is significant difference between the mean post test scores on Scientific attitude of prospective teachers in experimental and control groups.
- Experiential learning method will be effective in developing scientific attitude among prospective teachers.



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METHODOLOGY

Method of the Study

This study aimed at finding out the effect of experiential learning method in enhancing Scientific Attitude among prospective teachers. The participants were 60 prospective teachers. The experimental study was selected for this study. To study the effectiveness of experiential learning method in enhancing scientific attitude among prospective teachers, samples were divided randomly into two groups, with 30 students to each group, control group, and experimental group. This study took 27 working days with forty-five minutes a day for each group in the academic year 2019-2020.

SAMPLE OF THE STUDY

Sample

The sampling of the study consisted of 60 prospective teachers studying in University of Kerala, Thiruvananthapuram district. The treatment group was taught through the experiential learning method, while the control group was taught through the traditional teacher-centered method.

TOOLS OF THE STUDY

For this study, the researcher prepared lesson plans and pre and post-tests to measure the scientific attitude of prospective teachers. The lesson plans and pre and post-tests were designed and constructed based on the Science syllabus of 10th grade students. After the discussion with experts in science teaching, the researcher used the final lesson plans and pre and post-tests' items like tools for this study to collect data. A total of 11 science lessons were used in this study for both two groups as the material, and the researcher also was the instructor of the two groups.

DATA COLLECTION PROCEDURES

The researcher, with the help of teachers of Physical Science, selected prospective teachers to carry out his study from different teacher training institutions under university of Kerala. The researcher informed the participants about the purpose of the study, and it will include pre-test and intervention, and they were not informed about the post-test to avoid their memorization of the test. In week 1, the researcher divided the participants into two groups, control group and experimental group based on their scores of Science subject in the previous semester. Each group included rural, urban, low, and high socio-economic levels with 30 students for each group. The pre-test of Scientific Attitude was used to all the participants of the study to measure their level of Scientific Attitude. After doing the pre-test, the researcher started the intervention. In other words, the researcher started teaching the two groups based on the lesson plans. Control group students were taught by the traditional method, whereas the experimental group was taught by Experiential Learning method. In week 2, the researcher continued teaching the selected lessons for the two groups. In week 3, the researcher completed the lessons and administered a Scientific attitude post-test to all the participants to explore the differences between control and experimental groups results in pre-test and post-test.



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RESULTS AND DATA ANALYSIS

Tenability of Hypothesis I

There is significant difference between the mean pre test scores on Scientific attitude of prospective teachers in experimental and control groups

Table-1: Comparison of the mean pre test scores on scientific attitude of experimental group and control group.

Group	N	Mean	Standard Deviation	Calculated t value	Remarks
Experimental group	30	114.8889	2.657455	0.51785	NS
Control Group	30	114.4333	2.824564		

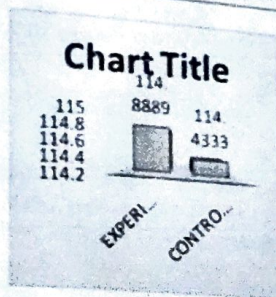


Figure.1

The analysis of the mean pre test scores on scientific attitude using the test of significance of the difference between the experimental and control groups revealed that the t value obtained (t=0.517) is not significant at 0.05 level. This shows that there is no significant difference between the mean pretest scores of experimental group and control group. Hence it is concluded that there is no significant difference between experimental and control groups with regard to their pre test scores of scientific attitude and this indicated the equivalence of the two groups.

Tenability of Hypothesis II

There is significant difference between the mean post test scores on Scientific attitude of prospective teachers in experimental and control groups.

Table- 2: Comparison of the mean post test scores on scientific attitude of experimental group and control group.

Group	N	Mean	Standard Deviation	Calculated t value	Remarks
Experimental Group	30	119.3667	2.953471	6.69051	Significant
Control Group	30	114.7778	2.423306		



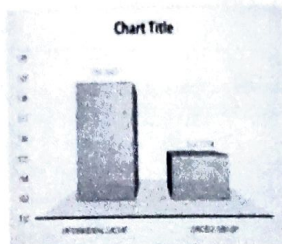


Figure 2

The analysis of the mean post test scores on scientific attitude using the test of significance of the difference between the experimental and control groups revealed that the t value obtained ($t=6.69$) is significant at 0.05 level. This shows that there is significant difference between the mean post test scores of experimental group and control group. Hence it is concluded that there is significant difference between experimental and control groups with regard to their post test scores of scientific attitudes.

Tenability of Hypothesis III

The students exposed to experiential learning method have enhanced scientific attitude as compared to those who are exposed to traditional learning method. This stresses the effectiveness of experiential learning method in the development scientific attitude among prospective teachers.

DISCUSSION

According to the result of this study which aims to bring forth the effectiveness of experiential learning method in the development of scientific attitude, the significant difference between the control group and the experimental groups found to be in the benefit of the experimental group. In other words, experiential learning method is a much better instructional way than the traditional learning method. Additionally, prospective teachers' interest, motivation, and participation increased according to the researcher's observation.

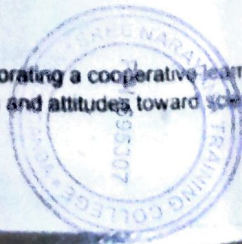
In control group on the other hand, traditional learning method had not much effect on the development of scientific attitude among the prospective teachers. It goes without saying that the material used in the experimental group were highly effective than the ones used in the control group.

CONCLUSION

Experiential learning is the application of theory and academic content to real-world experiences either within the classroom or the community which advances program or course-based learning outcomes. Scientific attitude will be developed through this activity based real life experiences. Therefore, using experiential learning method as a tool of teaching was a more effective method in teaching, developing, and improving scientific attitude for students than the traditional method.

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Educational Implications

- ① Proper awareness should be given to prospective teachers regarding NPE
- ① Prospective teachers should be aware about new trends in education
- ① Familiarize them about technological innovations.
- ① Give them an outlook regarding curricular and pedagogical framework
- ① Creating effective school infrastructure
- ① Multilingualism and power of language
- ① Curricular integration of essential subjects and skills
- ① Development of scientific temper
- ① Art and aesthetic education
- ① Promote oral and written communication skill

Conclusion

The National Education Policy 2019 envisions an India centred education system that contributes directly to transforming our nation sustainably into an equitable and vibrant knowledge society by providing high quality education to all. Teacher education in the country will move towards a high quality four year integrated B.Ed. programme. This will require substantial investment and capacity creation. To enable these high quality teacher education programmes, significant investment will be required in facilities, as also in the development of teacher educators. The approach of continuous professional development of teachers will be changed completely to provide effective, multimodal and high quality professional development opportunities. This will be very important in the short- and mid-term improvement of educational outcomes. Hence prospective teachers should have a sound knowledge regarding the national policy on education.

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