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St. Thomas College of Teacher Education, Pala, Kottayam, Kerala – 686 575 Web site: www.stce-pala.info, www.stctepala.org E-mail: educationalextracts@gmail.com Phone & Fax: 04822 216537

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UNIVERSITIES AND EXTENSION ACTIVITIES: A MODEL

Dr. G. Lokanadha Reddy* M. Shailaja**

Abstract

This paper elaborates the role of universities and higher education institutions in the context of extension education. Extension activities at present extend services to the wider public, keeping in mind the needs of the community. Any extension programme by the university must concentrate on the disadvantaged population such as women, unemployed youth, people below the poverty line, apart from people with semi-skilled and skilled to upgrade their knowledge and skills for better production of goods and services. The objectives of the extension programme are multi-dimensional. This aims at community development, generation of employment for youth, and Continuing Education/Distance Education for upgrading the skills and for Sustainable development. The University Model Extension Programme can be called as 'University at the Village Door Steps', by involving all the Teaching, Non-teaching, Scholars and Students of the university. The academic, research and training programmes offered by the Universities can be made more functional in nature and this may serve as a Model for Extension Activities by the Universities.

Key Words: *Extension activities, Knowledge generation, Dissemination, Documentation, Community development, Human development, etc.*

Introduction

Universities have to discharge adequately their responsibilities to the entire educational system and society as a whole. Extension is one of the responsibilities of higher education institutions along with research, training and teaching dimensions. This is an extremely significant dimension as universities have more social responsibility.

The concept of Extension at present is not confined to extending services to the schools and colleges, but also to the wider public, keeping in mind the needs of the community. Any extension programme must

^{*} Professor and Dean, School of Education and HRD, Dravidian University, Kuppam – 517 426, Chittoor Dist., A.P. State, India. E-mail:reddyloka1958@yahoo.co.in.

^{**} Research Scholar, Dept. of Education, Dravidian University, Kuppam – 517 426, Chittoor Dist., A.P. State, India.

utilization of local infrastructure facilities and exploitation of manpower resources to meet the requirements of the community demands. As such, any extension programme by the university must concentrate on the disadvantaged population such as women, unemployed youth, people below the poverty line, apart from people with semi-skilled and skilled to upgrade their knowledge, information and skills which result in better production of goods and services. The focus is in making the people's effective participation in development process.

Objectives of Extension Activities by the Universities

- 1. Generation of knowledge, information and skills and passing on the same to the target population.
- 2. Dissemination and documentation of healthy practices in terms of training and development, so as to replicate the same in other parts of the country.
- 3. Sensitization of people for the effective participation in the government developmental programs.
- 4. To provide on-the-job vocational training to enhance the skills of the community.
- 5. To understand the community problems and find-out appropriate solutions through research and innovations.
- 6. To provide better self-employment opportunities by utilizing the government support services.
- 7. To train the different categories of people for sustainable development in the community.
- 8. To develop liaison between government departments and the public.

On the whole, the universities extension activity should start with identification of community needs to the development of appropriate training methodologies/ approaches, imparting training to the personal and actual target group, generation of employment opportunities for better marketing facilities and making the people as active partners than passive spectators in the developmental programs.

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Extension Dimension of Universities: A Model

As already explained, in any university the extension activities have different facets. They are:

- I. Universities and community development.
- II. Universities and Generation of employment for youth.
- III. Universities and Continuing Education/ Distance Education for upgrading the skills.
- IV. Universities and Sustainable development.

I. Universities and Community Development

Universities are higher seats of learning. The knowledge generated and created and the skills available should be useful for the betterment of the common man. This functional aspect can be achieved through University Extension Activities. In other sense, *bringing University to the doorsteps of the community is the needs of the day*. The New Educational Policy lays stress on this and expects extension to be treated as the third major component of education. The fruits of research should be made available to the community through extension activities, one following the other closely. Now a days, Interdisciplinary/multidisciplinary approach is very essential for community development. This is certainly challenging tasks to link extension with some disciplines like chemistry, physics, commerce, bank management, physical education and women studies and so on. The department like Adult and Continuing Education should act as a nodal center to co-ordinate the activities of various faculties of the University for developmental work in the community. The faculties with their respective programs should reach the community and in turn enrich their academic programs/ curricula by incorporating the issues to solve community problems. As a nodal agency, the University should highlight the burning problems of the community. It should act as a catalyst agent. In the recent years, the new vistas of communication have been opened up for human development on account of a science and technology. Such new communications have been opened up for human development on account of a science and technology. Such new communication avenues should be profitably exploited for dissemination and documentation of information.

Role of Different University Departments in Community Development

i) The Faculty of Science can organize *Community Science Clubs* in villages. In organizing this, the local village talents must be exploited and it should be participatory in nature. Innovative information which will have direct bearing on the life of the community people can be discussed and demonstrated. In the science clubs, the members of the club can be trained to develop skills in them, which may improve their living conditions. These clubs can be used 'as potential centers for integrating the extension programs and functional training in various fields of science. These are problem of potable water, soil analysis, modern agricultural methods, identification of adulteration of food, biogas technology, horticulture, animal husbandry, sericulture, poultry etc. The Community Education Centre/Continuing Education arrange for Center must all infrastructure facilities in the villages to organize the Science Clubs and disseminate the above types of information to the rural people.

- ii) **The Faculty of Human Development** like Education and Women Studies / Social Work can play a dominant role in the extension work of the University. They can impart knowledge and skills to the community about their living conditions, socio-economic development, citizenship training, gender sensitivity and so on for better quality of life. The information on ideal child rearing practices, ways and means of solving early childhood problems to prevent disabilities, helping mothers to pick up the right practices like breast feeding and weaning, right time immunization, weight monitoring, family planning and the like.
- **iii)** The Faculty of Management can improve the lifestyles of the village people by giving better management practices to the community people in

their day-today life. They can provide knowledge related to water management, banking awareness, available bank facilities consumer awareness, consumer protection and so on.

- iv) The Faculty of Physical Education can give information & training in Yoga, rural sports and stress management. A separate Rural Sports Club for village youth can also be organized by utilizing the community education center and other infrastructural facilities in the community.
- v) The Department of Science and Technology/Bio-technology can propagate the concepts like smokeless choolas, renewable energy from the waste (Community bio-gas plant), use of solar energy for cooking and other daily use, vermin culture for generating nutrient rich fertilizers, soil conservation, judicious use of fertilizers and pesticides, occupational hazards and ways and means of protective measures and so on.
- vi) The Department of Computer Science and Technology can extend their knowledge to the community through appropriate ways and means. As the County is transforming rapidly towards modernization, the occupations or vocations of the people are also changing. For eg., even in rural areas now a days the youths are showing interest in Apparel and Fashion Designing, Designing Technology by using multimedia and other computer skills. As such, the Dept. of Computer Science should tune their extension

activities accordingly to generate better employment opportunities to the school youth and out-of-school youth.

vii) The Department of Folklore and Tribal Studies, Computational Linguistics and Language Departments can promote Language, Literature Art and Culture to the urban and rural of youth in the vicinity of the university, apart from developing better scientific attitudes mingled with good old traditions.

II. University and Generation of Employment for Youth

The effectiveness of any program depends on the user's survivability. In other words, the receivers of the program must be benefited in winning their bread and butter through the skills they acquired or provide by the universities. In this respect, while organizing the training programs to the youth, women etc., it should be locale specific and employment oriented. Development of local talents by exploiting the local resources for better employability should be the principle of any training program. Some of the employment generation programmes for the rural and urban youth are; *Dairy Farming*, Radio & TV Repairing, Hospitality, Travel and Tourism, Interior Decoration, Fire Fighting, Construction/ Masionary work, Medical Transcription, Book keeping Binding, Electronics repairing, Floral Freelance Decoration. writing. Photography, Fitness & Nutrition, Medical Office Assistant, Fashion Designing, Agriculture Motor repairing and rewinding, Mushroom culture, Food Preservation and Management, Training

in Kitchen gardening & Vegetable gardening, Seedling production and Tailoring and Knitting and so on.

III. Universities and Continuing Education/ Distance Education

The other face of extension is providing opportunities to different groups of people like industrial workers, teachers, social workers, household women and others who are in employment/ semi employment but are in need to improve their qualifications or upgrade their skills. For such population the University should offer programmes of continuing education through correspondence or distance education. While organizing these programmes, the university should keep in mind the nature and characteristics of learners, type of content and skills required to the learners, possible ways and means of adapting teaching and training technologies and continuous feedback and evaluation should be kept in mind. As such, the continuing education courses should be of six months, one year or two years duration leading to the award of Diplomas and Degrees.

These programmes should be ranging from development of general skills to more technical skills in the subjects like Sociology, Psychology, Management Training, Personality Development, Effective Communicative and Persuasive Skill Development, Training in Enabling Technologies for rural development and so on. The working governmental and nongovernmental personnel should be oriented about the innovative ways and means of reaching the needy people in terms of government development programmes, objectives, methodologies and benefits. Such orientation courses will have better functional value than the other. In organizing such courses, hands on experience in actual work situations should be the integral part of the programme. The knowledge generated through research should be well integrated in the training programmes and the same can be practiced in filed conditions. Unless distance education programmes are tuned in these lines, it is difficult to attain the objectives of the programme.

IV. Universities and Sustainable Development

Any extension programme by the University must concentrate on nation building activities. The country is facing problems like dreadful diseases like HIV/ AIDS, Degradation of Environment, Natural disasters like Earth quakes, Tsunami, Floods and Famines, Erosion of Family Values, Malnutrition and Under nutrition, Antisocial activities like terrorism and so on.

- i) HIV/AIDS: India is one of the worst affected country with this dreadful disease. To safeguard the present and future generations there is a greater need to sensitize the public about the safer relationships and need for family integration and value system. As universities are the potential bodies with large student manpower, they can sensitize the colleges and schools and they in turn do the same in the community and home. For this the available print and electronic media can be exploited profitably apart from traditional media.
- **ii) Degradation of Environment:** As the country is moving fast towards modernization, urbanization and

industrialization with the exploding population, the natural resources are depleting day by day. Further, we are experiencing Air, Water, Land and Noise pollution leading to environment degradation which threaten the people to move towards low quality of life. Due to growing urbanization and industrialization the natural environmental is polluted with the factory, waste, chemicals, pesticides, insecticides, radioactive waste etc., which in turn affect the sanitary conditions of the people. As a result, the quality of life is reducing. Due to deforestation, year by year we are experiencing unexpected flood and famine. To avoid this menace, the public should be educated and trained about the ways and means of sustainable development by conservation of environment. The universities should extend the supportive system to the community in the form of information, positive attitude building and development of technical know-how to manage their homes, community and society as a whole for sustainable development.

iii) Natural Disasters: Apart from the natural disasters like floods and famine, the unexpected disasters like earthquakes and Tsunami are playing havoc in human life. In such situations people need emotional support and help. As the universities are rich in terms of knowledge, information and skills with regard to stress coping strategies and generation of material resources, they should be at the doorsteps of the people who are in need. In fact, during such crisis situations, university should coordinate the governmental and nongovernmental organization activities and see that the people should be supported both materially and emotionally. Development of self-confidence and emotional guidance is the need of hour to the people in crisis situation. Within the university, the department of Adult Continuing Education and Extension should take the lead role at this end.

iv) Man Made Calamities: Apart from natural disasters man made calamities like erosion of family values, malnutrition, and antisocial activities (terrorism) are playing havoc in human life. Due to erosion of family values more and more single families with single parent are existing throughout the country. As a result, children are uncared and family values and cultures are far in sight year after year. Likewise, malnutrition and under nutrition particularly in women, children and disadvantaged groups likes destitute women, street children, disabled are more. Gender discrimination can be observed in every walk of life in home, community, society at large. Likewise, every part of the country is experiencing in some form or other social insecurity in the form of antisocial activities by certain vested interest group.

These are the local challenges before us that are to be dealt with global views. In other sense, local problems should be dealt by understanding and developing broader perspective about the issues and purposive actions must be initiated and promoted in the public. Universities are the right bodies to generate such global thinking in the local communities to solve these burning problems locally. In other words, the concept of 'Think Globally and Act Locally' perfectly fit in to solve our problem.

A Model Action Plan for Extension Activities by the Universities

Extension is the part and parcel of the activities of all the Departments of the University Staff, Scholars and Students. In this connection, the University Model Extension Programme called **'University at the Village Door Steps''**, by involving all the Teaching, Non-teaching, Scholars and Students of the university.

The University shall adopt a nearby Panchavat. The Staff and Students shall be placed in the selected Panchayat for two days in each semester with a clear cut plan of work concerning to their academic and research domains. More explicitly, each department shall develop its plan of action linking their academic and research work with their extension activity to identity the community problems, their root causes and to investigate the possible solutions by involving the local communities. In this process, the developmental agencies both Government and Non-governmental working in the local communities shall be involved and exploited for more constructive and organized actions.

Keeping the above ideology in mind, the Extension Activities in the Universities shall be in the following phases.

I In the First Phase - Identifying the Panchayat/ Villages to be adopted and

convening a meeting of Panchayat Raj Officials, Government/ Nongovernmental organizations working in the Panchayat (including local Schools/ Colleges/ Primary Health centers, Agricultures, Animal Husbandry and so on).

- II In the Second Phase Convening the Deans, Heads and Faculty Members meeting to persuade their role in extension activity and the need to involve themselves and students in community development work.
- III In the Third Phase Each Head of the Department / Coordinator of the Department for Extension Activity shall submit his/ her plan of extension activity proposals to the Central Coordinator of the University Extension Activities and orient their staff, scholars and students about the work to be carried out in the community.
- IV In the Fourth Phase The University shall place the students and staff in the villages for one week in each semester to identify the community resources, problems and prospects for development in their own areas.

After Phase four, the Head of the Department's shall consolidate their experiences and present a report to the Central Coordinator of the Extension Activities, so as to develop some action plan for interventions to solve community problems. It is a continuous process in every semester. In this process, the students, teachers, administrators, local community, developmental agencies both Government/ Non-governmental shall come together and understand the community resources, problems and identify the ways and means to find amicable solutions to improve the quality of the life of the people. In fact, the whole process facilitates the local communities to take organized actions to solve their own problems by organizing themselves. The students will be exposed to the local community and vice-versa. This shall develop a close bondage among the developmental agencies, university and the public.

More than this, the University Departments can enrich their academic and research programs, by incorporating the local issues into their curricular and co-curricular aspects. This way the academic, research and training programmes offered by the Universities can be made more functional in nature and this may serve as a Model for Extension Activities by the Universities.

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THE INFLUENCE OF CONTINUING EDUCATION PROGRAMMES ON THE EMPOWERMENT OF RURAL BENEFICIARIES

Dr. T. C. Thankachan* Sobin M.P**

Abstract

Kerala has the highest percentage of literacy amongst the states of India. As a result of the high literacy levels the Scheme of Continuing Education was launched in all the fourteen districts at the same time in 1995. The scheme of continuing education, taken up in a district after it has completed the total literacy and post literacy phases, makes the learners aware of the power and significance of education. The major Continuing Education Programmes are; Equivalency Education Programme, Income Generating Programme, Quality of Life Improvement Programme and Individual Interest Promotion Programme. The influence of Continuing Education Programmes in the empowerment of the rural beneficiaries is studied with the help of the Questionnaire and Interview Schedule. The findings showed that the Continuing Education, Quality of Life Improvement and Individual Interest Promotion have significant influence on the empowerment and multi-dimensional development of rural beneficiaries.

Key Words: Continuing Education Programmes, Equivalency Education, Income Generation, Quality of Life Improvement, Individual Interest Promotion, Rural Beneficiaries, etc.

Introduction

Life is a continuous process of adjustment by which man make harmonious existence with ever changing socio-cultural environment. The task of education is to equip individuals with psycho-social skills necessary for making this adjustment. Continuing Education is needed to thrive well in an ever changing environment. It helps an individual to keep up-to-date with new knowledge. In order to improve their quality of life and raise their incomes, the neo-

^{*} Assistant Professor, St. Thomas College of Teacher Education, Pala, Kerala. E-mail: tcthanks@rediffmail.com, Mob: 09447037105

^{**} Junior Lecturer in Economics, G.T.H.S.S., Peringassery, Kerala. E-mail: sobinmp@gmail.com, Mob: 08943001370

literates need to continue to develop their knowledge and skills through continuous education. It enables the learner to make continuous adjustment with ever changing and ever growing knowledge-driven digital world.

Kerala has the distinction of being a historic state in India so far as literacy development is concerned. It has the highest percentage of literacy amongst the states of India. It was the first state to experiment with a campaign for implementation of the Total Literacy Programme. Ernakulam became the first district in the country to be declared a fully literate district in February, 1990. The state itself was declared a fully literate state in 1991. As a result of the high literacy levels the Scheme of Continuing Education was launched in all fourteen districts at the same time in 1995. The comparatively high literacy rate of the state is visible on the roads of any town in Kerala. According to the 2011 census, 93.91 percent of people are literate in our state. We can see persons from the lower strata of society reading newspapers by the roadside stalls. This habit of reading newspapers has helped to enlightened them. It has also raised the demand for and strengthened the role of libraries at the Continuing Education Centres.

Continuing Education

Continuing education is any form of learning undertaken by persons who have completed their formal full time education and begins where childhood education ends and continuing through a person's life time. It is a programme directed towards adult population desiring and demanding greater knowledge with which to interpret a constantly changing world. Education is a lifelong process, it continues throughout the life individual and it is life itself. Continuing Education is based on the principle that learning is a lifelong process. The present contituing education and literacy programmes are functioning under Lifelong Education and Awareness Programme (LEAP mission). The continuing education scheme is postulated on the principles of:

- Treating basic literacy, post literacy and continuing education as one sustained, coherent learning process.
- Establishing a responsive and alternative structure for life-long learning.
- Responding to the needs of all sections of society.
- Learning not to be seen as a function of alphabets, but as all modes of human capacity building.
- Addressing the socio-economic situations of the community to provide infrastructure for larger development initiatives.

Thus, the scheme of continuing education, taken up in a district after it has completed the total literacy and post literacy phases, makes the learners aware of the power and significance of education. They realize that education is the agency for improving their lives and they tend to find ways to use their literacy skills in their everyday life to make it more meaningful and rewarding. The continuing education scheme is, therefore, multi-faceted and enjoys supreme flexibility to allow grassroots community participation and managerial initiative. The major Continuing Education Programmes are;

- Equivalency Education Programme
- Income Generating Programme
- Quality of Life Improvement Programme
- Individual Interest Promotion Programme

Equivalency Education Programme (*EEP*): Equivalency programme is designed as an alternative education programme equivalent to existing formal, general or vocational education. This s a programme of government under literacy service and designed as an alternative education programme equivalent to existing formal, general or vocational education. For example government of Kerala is offering fourth standard, seventh standard and tenth standard equivalency examination for the adult persons through other agencies.

Financial Development Programme (*FDP*): In Financial Development Programme the participants acquire or upgrade their vocational skills and take up income-generating activities. It is also called as financial development programme. Illiteracy is intrinsically linked with poverty. Therefore, any programme that aims at removal of illiteracy should harp on poverty eradication too. Since low income is the basic cause of poverty, income generating activities are to be made part of the CE Programme. Formation of Self Help Groups, thrift and credit operation and microcredit come under the purview of this activity.

Quality of Life Improvement Programme (QLIP): Quality of Life Improvement Programme aims to equip learners and the community with essential knowledge, attitude, values and skills to raise their standard of living. Quality of life refers to the level of well being of the society and the degree of satisfaction of the number of human needs. Quality of life improvement programmes aims to equip learners and the community with that essential knowledge, attitudes, values and skills which enable them to improve the quality of life as individuals and as members of the community.

Individual Interest Promotion **Programme** (IIPP): Individual Interest Promotion Programme provides opportunities for learners to participate and learn about their individually chosen social, cultural, spiritual, health, physical and artistic interests. The objective of the individual interest promotion programmes is to provide individuals the opportunity to participate in social, cultural, spiritual, health, physical and artistic interest of their choice. The main motivation to participate in an individual interest promotion programme is to satisfy and follow a particular interest and in practice this is frequently, but by no means always, a recreational interest. Activities under IIPP's can be identified as those that are largely meant for spending leisure time, especially hobbies.

Continuing Education Centres (CECs)

The central facility for the implementation of a Continuing Education programme is a continuing education centre (CEC). This centre is set up to cater to a population of 2,000-2,500, 500-1,000 of whom would be neo-literates with basic literacy skills acquired under the Total Literacy and Post Literacy Programmes. Financial assistance is provided for the establishment and maintenance of the CECs by the State

Literacy Mission Authority. The Kerala State Literacy Mission Authority (KSLMA) is an autonomous body constituted for this purpose. The Lifelong Education and Awareness Programme (LEAP) is a model programme for the entire state with resepect to the present literacy, continuing education and lifelong learning programme.

Establishment of Continuing Education Centers (CECs) and Nodal Continuing Education Centres (NCESs) is the principal mode of implementing continuing education programmes. The centres follow an areaspecific, community-based approach. The scheme envisages one CEC for each village to serve a population of about 1,500-2,000 people. About 10 such centres form a cluster with one acting as the nodal CEC. The centres are run by full-time facilitators or preraks, and assistant preraks who are drawn from the community itself. The continuing education centre serves as:

- Library and reading room
- Teaching-learning centre for continuing education programmes
- Vocational training centre
- Extension centre for facilities of other development departments
- Discussion forum for sharing ideas and solving problems
- A composite information window for the community
- Cultural centre
- Sports and recreation centre

While the central government does provide financial assistance for initial establishment and running of CECs, in the long run all such CECs are expected to become self-sustaining. The scheme,

therefore, envisages provision of financial assistance from the central government and the state governments for the first five years. The central government provides 100 per cent financial assistance to a district for the first three years. In the fourth and fifth year, the cost is to be shared on 50:50 bases by the central and state governments. The continuing education centers in Kerala are: Voluntary agencies, Mahila mandals, Panchayathraj institutions, Nehru Yuva Kendra's, National service scheme etc. Lifelong Education and Awereness Programme (LEAP) covers a variety of activities such as seminar, conferences, correspondence study, evening classes, radio and TV programmes, community association, etc.

The Jan Shikshan Nilayam, which started in 1988, is meant to promote educational, vocational and occupational development of literates, neo-literates, semiliterates and un-lettered persons. These act as Resource Support Agencies especially with regard to organizing vocational training and skill development programmes. During the Ninth Plan, the scheme has been strengthened with enhanced funding and a wider scope and area of operation. The focus of the scheme is now shifting from industrial workers in urban areas to the socioeconomically backward and educationally disadvantaged groups in urban and rural areas, such as neo-literates, semi-literates, SCs/STs, women and girls, slum dwellers, migrant workers, etc. Jana Shikshan Nilayam was stared all over the country to institutionalize post-literacy and continuing education. It is seen that in the absence of a learning environment and effective programme of post literacy and continuing education, the efforts made in literacy programmes yield extremely limited results.

Concept of Empowerment

According to Wallerstein (1992), Empowerment is a social-action process that promotes participation of people, organizations, and communities towards the goals of increased individual and community control, political efficacy, improved quality of community life, and social justice. While Whitmore (1988) feels the concept of empowerment needs to be more clearly defined, she states that there are some common underlying assumptions: Individuals are assumed to understand their own needs better than anyone else and therefore should have the power both to define and act upon them; All people possess strengths upon which they can build; Empowerment is a lifelong endeavour; and Personal knowledge and experience are valid and useful in coping effectively.

For the purpose of this study, Empowerment refers to increasing the spiritual, political, social, educational, gender, or economic strength/capacities of individuals and communities. It gives the ability to take decisions, participation in various programmes, and management of resources. The government had implemented different programmes for the development of people in a country especially for the empowerment of the rural people. The major development programmes are;

a) Pradhan Mantri Gram Sadak Yojana (*PMGSY*): Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on 25th December 2000 as a fully funded

Centrally Sponsored Scheme to provide all weather road connectivity in rural areas of the country. The programme envisages connecting all habitations with a population of 500 persons and above in the plain areas and 250 persons and above in hill States, the tribal and the desert areas.

- **b**) Swarnjayanti Gram Swarozgar Yojana (SGSY): The objective of the Swarnjayanti Gram Swarozgar Yojana (SGSY) is to bring the assisted poor families above the Poverty Line by ensuring appreciable sustained level of income over a period of time. This objective is to be achieved by inter alia organizing the rural poor into Self Help Groups (SHGs) through the process of social mobilization, their training and capacity building and provision of income generating assets. The SHG approach helps the poor to build their self-confidence through community action. An interaction in group meetings and collective decision making enables them in identification and prioritization of their needs and resources. This process would ultimately lead to the strengthening and socio economic empowerment of the rural poor as well as improve their collective bargaining power.
- c) *Rural Housing*: Housing is one of the basic requirements for human survival. For a normal citizen owning a house provides significant economic and social security and status in society. For a shelter less person, a house brings about a profound social change in his existence, endowing him with an identity,

thus integrating him with his immediate social milieu. A housing programme for the rehabilitation of refugees was taken up immediately after partition by the Ministry of Refugee Rehabilitation and this lasted till around 1960.

- *d*) The National Social Assistance **Programme** (NSAP): The National Social Assistance Programme (NSAP) is a welfare programme being administered by the Ministry of Rural Development. This programme is being implemented in rural areas as well as urban areas. NSAP represents a significant step towards the fulfillment of the Directive Principles of State Policy enshrined in the Constitution of India which enjoin upon the State to undertake within its means a number of welfare measures. These are intended to secure for the citizens adequate means of livelihood, raise the standard of living, improve public health, provide free and compulsory education for children, etc.
- Council for Advancement of People's **e**) **Technology** Action & Rural (CAPART): Recognizing the need for an organization that would coordinate and catalyze the development work of voluntary agencies in the country, particularly to ensure smooth flow of benefits to the underprivileged and socioeconomically weaker sections of society, Government of India, in September, 1986 set up the Council for Advancement of People's Action and Rural Technology (CAPART), a registered society under the aegis of the Department of Rural Development, by merging two autonomous bodies, namely, People's

Action for Development of India (PADI) and Council for Advancement of Rural Technology (CAPART).

- f) The District Rural Development Agency (DRDA): The District Rural Development Agency (DRDA) has traditionally been the principal organ at the District level to oversee the implementation of different anti-poverty programmes. Since its inception, the administrative costs of the DRDAs were met by way of setting apart a share of the allocations for each programme.
- **Provision of Urban Amenities in Rural g**) Areas (PURA): Ministry of Rural Development (MoRD). Government of India has re-launched the scheme "Provision of Urban Amenities in Rural Areas" (PURA) as a Central Sector scheme during remaining period of the XI Plan. MoRD with support from Department of Economic Affairs and the technical assistance of Asian Development Bank intends to implement the PURA scheme under a Public Private Partnership (PPP) framework between Gram Panchayath(s) and private sector partners. The scheme envisages twinning of rural infrastructure development with economic regeneration activities and is the first attempt at delivering a basket of infrastructure and amenities through PPP in the rural areas. It is an effort to provide a different framework for the implementation of rural infrastructure development schemes and harness private sector efficiencies in the management of assets and delivery of services.

Dr. A.P.J. Abdul Kalam highlighted a vision of transformation of rural India through launching a mega mission for Provision of Urban Amenities in Rural Areas (PURA). Dr. Kalam visualized providing four connectivities: physical connectivity, electronic connectivity, knowledge connectivity leading to economic connectivity of rural areas. PURA was envisaged as a self-sustainable and viable model of service delivery to be managed through an implementation framework between local people, public authorities and the private sector.

This study on the continuing education programmes and self help groups is of great help to the government authorities and local bodies to adopt necessary steps for improving the quality and efficiency of the Continuing Education Centres and Self Help Groups. Moreover, it would encourage concerned authorities to examine the effectiveness of various programmes carried out from time to time so that necessary modifications and suitable changes might be made to re-vitalize the process. Hence the present paper is entitled as, "The Influence of Continuing Education Programmes on the Empowerment of Rural Beneficiaries".

Objective of the Study

1. To find out the influence of Continuing Education Programmes with respect to Equivalency Education Programmes, Individual Interest Promotion Programmes, Financial Development Programmes, Life Quality Improvement Programmes in the Empowerment of Rural Beneficiaries of Kottayam District.

Methodology of the Study

The descriptive method is used to find out the influence of Continuing Education Programmes on the Empowerment of Rural Beneficiaries of different Panchayaths of Kottayam District. In order to meet the objectives of the study, the investigator had selected the following variables namely; Continuing Education and Empowerment of Rural Beneficiaries. Total number of respondents in the sample is 200 participants belong to different Continuing Education Centes of the selected Grama Panchayaths of Kottayam district.

In the proposed study the investigator used the following tools. Interview Schedule and Questionnaire for rural beneficiaries belongs to different continuing education centres from selected Panchayaths of Kottayam District. Investigator also collected secondary data relevant for the study from various magazines, text books, website, etc. Mostly the study utilized the qualitative analysis, as the study is a qualitative study i.e., Number, Mean, and Percentage.

Analysis and Interpretation of the Data

Objective 1:

The influence of Continuing Education Programmes with respect to Equivalency Education, Individual Interest Promotion, Financial Development, Life Quality Improvement Programmes in the Empowerment of Beneficiaries

The investigator formulated this objective to find the influence of Continuing Education Programmes with respect to Equivalency Education Programmes (EEP), Individual Interest Promotion Programmes (IIPP), Financial Development Programmes (FDP), and Life Quality Improvement Programmes (LQIP) in the Empowerment of Beneficiaries of different Panchayats of Kottayam District. The questionnaire consisting of 60 questions was used to collect the relevant data. Table 1 presents the responses of the beneficiaries of Continuing Education Programme of various Panchayats of Kottayam District regarding the empowerment.

Table 1

The Responses of the beneficiaries of Continuing Education Centres on different Programmes

No.	Questions	Resp onses	%
1. i)	When you have to take some important decisions in your life, do you seek the advice of others?		
	a) Yes b) No	198 2	99 1
ii)	If yes whose advice will you seek a) Family members b) Respected persons of the	110	56
	society c) Preraks	50 16	25 9
	d) Friends	20	10
2.	From where you received training to take important decisions?	76	38
	b) from discussion	10	5
	 c) From continuing education d) Knowledge from special 	26	13
	training	8	4
	e) From personality development programmes by continuing education		
3. i)	centers Do you attend Continuing	80	40
	Education Classes regularly? a) Yes b) No	190 10	95 5

ii) If no, why? a) Lack of time b) Travel a long distance c) Preraks are not coming regularly d) Not useful a) e) Others 4. Do you go to Janavidhya	40 20 10 30 - 35
a) Lack of time 4 b) Travel a long distance 2 c) Preraks are not coming regularly 1 d) Not useful 3 e) Others - 4. Do you go to Janavidhya	40 20 10 30 - 35
b) Travel a long distance 2 c) Preraks are not coming regularly 1 d) Not useful 3 e) Others - 4. Do you go to Janavidhya	20 10 30 - 35
c) Preraks are not coming regularly 1 d) Not useful 3 e) Others - 4. Do you go to Janavidhya	10 30 - 35
regularly 1 d) Not useful 3 e) Others - 4. Do you go to Janavidhya	10 30 - 35
d) Not useful 3 e) Others - 4. Do you go to Janavidhya	30 - 35
e) Others - 4. Do you go to Janavidhya	- 35
4. Do you go to Janavidhya	35
	35
kendras/Aksnra sangnams?	35
a) Yes 70	~-
b) No 130	65
5. What is the main purpose of	
joining Continuing Education	
centres?	
a) To learn to sign only 15	8
b) To learn to read and write 59	29
c) To earn more 31	16
d) To spend time 2	1
e) To learn basic calculations 5	2
f) To write letters and read 88	44
6 From where do you get knowledge	••
about Continuing Education	
Programmes?	
a) Angenavadis 37	19
b) Preraks 50	25
c) Beneficiary of Continuing	
Education Programmes 45	23
d) Panchavat office 68	34
e) Any other	-
7 Have you written equivalency	
examination?	
a) Yes 176	88
b) No 24	12
8 What programme is most	12
efficient under Continuing Education	
Programmes?	
a) EEP 84	42
b) FDP 66	33
c) IIPP 30	15
d) I OIP 20	10
9 When did you feel that if	10
Continuing Education Centres	
are useful?	
a) After getting awareness	
about vaccination 24	12
b) After getting awareness	
about different loan facilities 28	14

	c) After getting training for new job	48	24		b) Learned to us methods in a
	d) After getting opportunity for Continuing Education	90	45		c) Took loan for employment f
	e) After participating in arts				d) Developed sa
10.	and sports What is the main achievement after	10	5		e) Took interest of their childre
	joining Continuing Education?			18.	Do you have a job r
	a) disciplined life	24	12		a) Yes
	b) better profitable occupation	26	13		b) No
	c) ability to free problematic		40	19.	Have vou had suffici
	situation in life	20	10		training for the job?
	d) high income	10	5		a) Yes
	e) understand the importance	400	00		b) No
	of education	120	60	20.	Did Continuing Educ
11.	How do you spend leisure time?		47		helped for the impro-
	a) participation in SHG	34	1/		of your job?
	b) reading news paper	46	23		a) Yes
	c) watching IV	86	43		b) No
	d) going for participating	24	10	21.	If you are an agricult
	III CEF	10			your production incr
10	e) Teauling Dook	10	5		a) Yes
12.	a) Voc	17/	97		b) No
	a) les b) No	26	13	22.	Do you spent more t
13	Are you aware of widow pension	20	10		your income?
10.	old age pension, and pension				a) Yes
	for agriculture workers?				b) No
	a) Yes	170	85	23.	Do you have your o
	b) No	30	15		a) Yes
14.	Do you know anything about				b) No
	India's relation with her			24.	What do you use to o
	neighbours?	400			a) Fire wood
	a) Yes	168	84		 b) Kerosene sto
4.5	b) No	32	16		c) Biogas
15.	Do FDP help in doing the job				d) LPG
	a) Yee	150	70		e) Any other
	a) les b) No	100	21	25.	Do you know anythi
16	b) NU Have you practiced any new job?	42	21		biogas plant?
10.	a) Ves	18/	02		a. Yes
	b) No	16	8		b. No
17	What are the new things that you		Ŭ	26.	Do you know about
	did after joining Continuing				of scholarship from th
	Education Centre?				other eligible commu
	a) Improved the job condition				a) Yes
	after receiving technical		6-		b) No
	awareness from CEC	70	35		2, 110

	 b) Learned to use scientific methods in agriculture 	20	10
	c) Took loan for self		
	employment from banks	12	6
	d) Developed saving habits	38	19
	 e) Took interest in the education of their children 	60	30
3.	Do you have a job now?		
	a) Yes	184	92
	b) No	16	8
).	Have you had sufficient		
	training for the job?	450	70
	a) Yes	158	79
	b) No	42	21
).	Did Continuing Education		
	neiped for the improvement		
		171	07
	a) tes	26	0/ 12
	D) INO	20	15
•	vour production increased		
	a) Ves	158	70
	a) les b) No	12	73 21
)	Do you spent more than	42	21
	vour income?		
	a) Yes	130	65
	b) No	70	35
S	Do you have your own house?		
	a) Yes	172	86
	b) No	28	14
L	What do you use to cook food?		•••
•	a) Fire wood	124	62
	h) Kerosene stove	14	7
	c) Biogas	10	5
	d) LPG	52	26
	e) Any other	-	-
5	Do you know anything about		
	biogas plant?		
	a. Yes	134	67
	b. No	66	33
<u>.</u>	Do vou know about availability		
	of scholarship from the		
	government for minorities and		
	other eligible communities?		
	a) Yes	148	74
	b) No	52	26

27.	i) Do you interest in your children's studies?			36.	Do you feel the need to react against injustice and crime?		
	a) Yes	174	87		a) Yes	192	96
	b) No	26	13		b) No	8	4
	ii) If yes, how did you encourage them in their			37.	Do you participate in public function?		
	studies?				a) Yes	150	75
	 a) By providing learning 				b) No	50	25
	facilities at home	80	40	38.	Do you participate in celebrating		
	b) By arranging tuition classes	50	25		days having national importance?		
	c) By encouraging them to				a) Yes	190	95
	study	40	20		b) No	10	5
	d) By taking active part in PTA	20	10	39.	Are you a member of any		
	e) Any other specify	-	-		cultural organization?	450	
28.	Do the boys in your family get				a) Yes	156	78
	the special consideration?				b) No	44	22
	a) Yes	30	15	40.	Do you treat yourself when		
	a) No	170	85		you are III?	110	-
29.	Do you discourage girl's				a) Yes	112	56
	education?				b) No	88	44
	a) Yes	14	7	41.	What kind of treatment		
	b) No	186	93		ao you prefer?	10	-
30.	Are you aware of the girl's				a) Naturopathy	10) J
	marriage age?				b) Homeopathy	102	10
	a) Yes	192	96		c) Allopathy		0
	b) No	8	4		a) Apy other	00	29
31.	Do you engage in social work?			10	e) Any other	-	-
	a) Yes	186	93	4Z.	DO you keep a separate		
	b) No	14	7			128	61
32.	Has social organizations helped				b) No	72	36
	your study centre in anyway?			13	Are you aware of the problem of	12	
	a) Yes	164	82	45.	environmental pollution?		
	b) No	36	18		a) Yes	188	94
33.	How is your relationship with				b) No	12	6
	neighbours?		40	44	Do you make sure that food	'-	ľ
	a) Very good	24	12		vou eat is nutritious?		
	b) Good	116	58		a) Yes	102	51
	c) Moderate	26	13		b) No	98	49
	d) Indifferent	14	7	45.	Do you think meat, fish, eggs,		
34.	As a beneficiary of Continuing				milk and fruits should be		
	Education Programme have you				taken along with vegetable		
	neiped your neighbours?	400			as a part of your diet?		
	a) Yes	160	80		a) Yes	194	97
05		40	20		b) No	6	3
35.	Do you watch any culture			46.	Are you aware of the		
		470			population explosion?		_
	a) Yes	1/8	89		a) Yes	128	64
	D) NO	22	11		b) No	72	36

47.	Do you believe in the small family norm?		
	a) Yes b) No	168 32	84 16
48.	What is your attitude towards employing family planning?	10.4	00
	a) Positive b) Negative	184	92
49.	c) No knowledge Have you ever participated in awaranass classes?	2	1
	a) Yes	172	86 14
50.	Do you participate in community development programmes?	20	17
	a) Yes b) No	152 48	76 24
51.	Do you participate in Grama Sabha?		
	a) Yes b) No	134 66	67 33
52.	Do you consider your children as a burden to your family?	10	
	a) Yes b) No	16 184	8 92
53.	Are there any young members in your family who work but do not spend money for the family?		
	a) Yes b) No	4 196	2 98
54.	Have you ever tried to change the negative activities of the young generation?		
	a) Yes b) No	132 68	66 34
55.	Do you, engage in social work? a) Yes	102	51
56.	ە) No Are you aware of the events taking place in the world?	98	49
	a) Yes b) No	184 16	92 8
57.	Are you aware of Quality of Life Improvement Programme?		
	a) Yes b) No	178 22	89 11

58.	Do you believe in shakunam? a) Yes b) No	182 18	91 9
59.	Do you oppose the abortion of girl child? a) Yes b) No	178 22	89 11
60.	Are you aware of the existing value system in our country?	100	00
	a) res	180	90
	b) No	20	10

The beneficiaries were asked whether they seek the advice of others when they have to take some important decisions in their life. 99% of the beneficiaries seek the advice of others. Most of them 56% discuss it with their family members, 25% discuss with respected persons in the society, 9% discuss with Preraks and 10% discuss with friends.

Among the beneficiaries of Continuing Education Programme, 38% of the beneficiaries got training to take important decision from awareness classes, 5% from discussions, 13% from Continuing Education 4% from special training and 40% from personality development programme conducted by Continuing Education Centre.

The study revealed that of 95% of the beneficiaries were able to attend the Continuing Education class regularly and 5% of the beneficiaries were not able to attend the Continuing Education class regularly. 40% of the beneficiaries said that lack of time, 20% of the beneficiaries due to travel a long distance, 10% of the beneficiaries due to greraks are not coming regularly, 30% of the beneficiaries due to Continuing Education class are not useful. It was observed that only 35% used to go to such facility centers, the rest (65%) had not availed the facility.

The beneficiaries were asked to give the reason for joining Continuing Education Class. The data showed that 8% of the beneficiaries joined Continuing Education class to learn to sign, 29% to learn to read and write, 16% to earn more, 1% to spent time, 2% to calculate and 44% beneficiaries joined Continuing Education to read, write, calculate and earn more.

19% of the beneficiaries got information about Continuing Education from Anganwadi Centres, 25% from Preraks, 23% from Beneficiaries of Continuing Education and 34% from panchayath office.

Among the beneficiaries 64% were of the opinion that Continuing Education is useful after getting opportunity for Continuing Education, 22% were of opinion that Continuing Education is useful after getting loan facilities, 5% after getting training for new job and 12% after getting awareness about vaccination and 5% after getting opportunity for participating in arts and sports.

60% of the beneficiaries understand the importance of education after joining Continuing Education centre, 12% of the beneficiaries had disciplined life, 13% of the beneficiaries had better profitable occupation, 10% of the beneficiaries had the ability to free problematic situation in life and 5% of the beneficiaries had high income.

43% of the beneficiaries spend their leisure time watching different media programmes, 17% of beneficiaries participate in SHG discussions, 18% reading newspaper, 12% participating in Continuing Education Programme, 12% reading books and 10% engaged in other activities. The Graph 5.9 shows the Spending Habits of benefiaries at Leisure Time.

87% of the beneficiaries were having knowledge about the consumer rights. 85% of beneficiaries were aware about widow pension, old age pension and pension for agriculturalists. The study revealed that 84% were aware about the India's relation with the neigbouring countries.

Among the beneficiaries of Continuing Education, 79% were of the opinion that Financial Development Programmes (FDP) helped the beneficiaries to do their job in a better way. The study revealed that 92% of the beneficiaries had received training for new job.

The beneficiaries were asked about the new things that they did after joining Continuing Education. 35% of the beneficiaries said that they improved their job, 30% gave special care in the education of their children, 19% of the beneficiaries developed saving habits, 6% took loan for self employment from banks and 10% learned to use scientific innovations in the field of agriculture.

The beneficiaries were asked whether they are employed. The study revealed that 92% of the beneficiaries were employed. Among the beneficiaries, 79% had received sufficient training for their job. The study revealed that 87% of the beneficiaries were of the opinion that Continuing Education helped for the improvement of their job.

The beneficiaries were asked that whether their production increased (of the beneficiary who is an agriculturist). 79% of the beneficiaries said that after joining Continuing Education their production increased. When the beneficiaries were asked whether they spend more than their income, 65% said that they spend more than their income. Majority of the beneficiaries 86% were having their own house. Regarding the cooking fuel, 62% of the beneficiaries were using fire wood and 26% depends on LPG. Only 7% depends on kerosene and 5% uses biogas. Surprisingly 67% had heard about biogas plant.

Regarding scholarship for the minorities, 74% were having the knowledge of such facilities. The participants of Continuing Education are supposed to take interest in their children's studies, so they should not face the difficulties.

The data showed that the majority 87% of the beneficiaries take interest in their children's studies. 40% of the beneficiaries providing learning facilities at home, 25% of the beneficiaries arranging tuition classes for their children, 20% of the beneficiaries encouraging them to study, 10% of the beneficiaries taking active part in PTA.

In the present study, it has been observed that 85% of the beneficiaries have given equal consideration for boys and girls in their family. Many times girls were not allowed for higher education in the Indian families and the education was stopped after getting the elementary education. The data showed that 93% of the beneficiaries were in favour of higher education for girls. Data revealed that 96% of beneficiaries were aware about the legal age of marriage of girls.

The study revealed that, 93% of the beneficiaries engage in social work. Majority 82% said that social organization has helped their study centers. The study revealed that 12% of beneficiaries have very good relation with neighbours, 58% of the beneficiaries have good relation with neighbour, 13% have moderate relation with neighbour and the rest of the 7% has indifferent relation with neighbours. Majority, 80% of the beneficiaries said that they help their neighbours in various ways.

Regarding watching various cultural programmes, 89% of the beneficiaries used to watch various cultural programmes such as Theyyam, Drama, Thiruvathirakali etc. Regarding the reaction of beneficiaries against injustice and crime, the data revealed that 96% of the beneficiaries felt there is a need to react against injustice and crime. Similarly with regard to participation in public function, 75% participate in the public functions. 95% used to celebrate the days of national importance. 78% of the beneficiaries were members of some of the cultural organizations.

56% of the beneficiaries were found to treat themselves when they are ill. The data showed that major part (51%) were dependent on Allopathic treatment, 15% on homeo treatment, 29% on Ayurveda and 5% on naturopathy. Interestingly, 64% of the beneficiaries keep a separate account for health care. 94% of the beneficiaries were aware of environmental pollution. 51% make sure that they eat nutritious food. Also, 97% of the beneficiaries include meat, fish, egg, milk and fruits along with vegetables as a part of their diet.

64% of beneficiaries are aware of population explosion. 84% of the beneficiaries believe in small family norm. Also, 92% of the beneficiaries have positive attitude towards family planning, 7% of the beneficiaries have negative attitude towards family planning and 1% of the beneficiaries have no knowledge about family planning. 86% of the beneficiaries have participated in awareness classes. The 76% of the beneficiaries participated in community development programme. The study showed that 67% of the beneficiaries participate in Gramasabha.

8% of the beneficiaries consider the children as a burden family who does not spend money for the family, 2% agreed that such members are there in the family. 66% of the beneficiaries tried to change the negative activities of the young generation.

Regarding the social activities, the data revealed that 51% of the beneficiaries engage in social work. When the beneficiaries were asked regarding the awareness of the events taking place in the world, 92% of the beneficiaries were aware of the events taking place in the world. The study revealed that 89% of the beneficiaries were aware about Life Quality Improvement Programmes conducted under their Continuing Education Centre. 91% believe in superstitions. But 89% of the beneficiaries were against abortion of girl child. Also 90% were aware of the value system existing in India.

Major Findings of the Study

A. Empowerment of Beneficiaries through Continuing Education Programmes

1. The beneficiaries were asked whether they seek the advice of others when they have to take some important decisions in their life. It is clear that, 99% of the beneficiaries seek the advice of others. Most of them (56%) discuss it with their family members, 25% discuss with respected persons in the society, 9% discuss with Preraks and 10% discuss with friends.

- 38% of the beneficiaries got training to take important decision from awareness classes, 5% from discussions, 13% from Continuing Education 4% from special training and 40% from personality development programme conducted by Continuing Education Centre.
- 3. 95% of the beneficiaries were able to attend the Continuing Education class regularly and 5% of the beneficiaries were not able to attend the Continuing Education class regularly. 42% of the beneficiaries due to lack of time, 28% of the beneficiaries due to lack of time, 28% of the beneficiaries due to travel a long distance, 15% of the beneficiaries due to greraks are not coming regularly, 15% of the beneficiaries due to Continuing Education class are not useful. It was observed that only 35% used to go to such facility centers, the rest (65%) had not availed the facility.
- 4. The beneficiaries were asked to give the reason for joining Continuing Education Class. The data showed that 8% of the beneficiaries joined Continuing Education class to learn to sign, 29% to learn to read and write, 16% to earn more, 1% to spent time, 2% to calculate and 44% beneficiaries joined Continuing Education to read, write, calculate and earn more.
- 19 % of the beneficiaries got information about Continuing Education from Anganwadi Centres, 25% from Preraks, 23% from Beneficiaries of Continuing Education, 34% from panchayath office.

- 6. Among the beneficiaries of Continuing Education Programme, 88% have written equivalency examination.
- 7. The beneficiaries were asked, which is the most efficient programme functioning under their Continuing Education Centre. 42% of the beneficiaries were in favour of EEP, 33% were in favour of FDP, 15% in favour of IIPP and 10% were in favour of LQIP.
- 8. 45% of the beneficiaries were of the opinion that Continuing Education is useful after getting opportunity for Continuing Education, 14% were of opinion that Continuing Education is useful after getting loan facilities, 24% after getting training for new job and 12% after getting awareness about vaccination and 5% after participating in Arts and Sports.
- 9. 60% of the beneficiaries understand the importance of education after joining Continuing Education centre, 12% of the beneficiaries had disciplined life, 13% of the beneficiaries had better profitable occupation, 10% of the beneficiaries had the ability to free problematic situation in life and 5% of the beneficiaries had high income.
- 48% of the beneficiaries spend their leisure time watching different media programmes, 17% of beneficiaries participate in SHG discussions, 23% reading newspaper, 12% participating in Continuing Education Programme, 10% reading books.
- 11. 87% of the beneficiaries were having knowledge about the consumer rights.
- 12. 85% of beneficiaries were aware about widow pension, old age pension and pension for agriculturalists.

- 13. 84% of beneficiaries were aware about the India's relation with the neigbouring countries.
- 14. 79% were of the opinion that Financial Development Programmes (FDP) helped the beneficiaries to do their job in a better way. The study revealed that 92% of the beneficiaries had received training for new job.
- 15. 35% of the beneficiaries said that they improved their job, 36% gave special care in the education of their children, 19% of the beneficiaries developed saving habits 6% took loan for self employment from banks and 10% learned to use scientific innovations in the field of agriculture after joining the continuing education programme.
- 16. 92% of the beneficiaries were employed. Among the beneficiaries, 79% had received sufficient training for their job. The study revealed that 87% of the beneficiaries were of the opinion that Continuing Education helped for the improvement of their job.
- 17. The beneficiaries were asked that whether their production increased (of the beneficiary who is an agriculturist).79% of the beneficiaries said that after joining Continuing Education their production increased.
- 18. When the beneficiaries were asked whether they spend more than their income, 65% said that they spend more than their income.
- 19. 86% of the beneficiaries are having their own house. Regarding the cooking fuel, 62% of the beneficiaries were using fire wood and 26% depends on LPG. Only 7% depends on kerosene, 5% uses

biogas. Surprisingly 67% had heard about biogas plant.

- 20. 74% were having the knowledge of such facilities. The participants of Continuing Education are supposed to take interest in their children's studies, so they should not face the difficulties.
- 21. 87% of the beneficiaries take interest in their children's studies. 40% of the beneficiaries providing learning facilities at home, 25% of the beneficiaries arranging tuition classes for their children, 20% of the beneficiaries encouraging them to study, 10% of the beneficiaries taking active part in PTA.
- 22. 85% of the beneficiaries have given equal consideration for boys and girls in their family. Many times girls were not allowed for higher education in the Indian families and the education was stopped after getting the elementary education. The data showed that 93% of the beneficiaries were in favour of higher education for girls.
- 23. 96% of beneficiaries were aware about the legal age of marriage of girls.
- 24. 93% of the beneficiaries engage in social work. Majority 82% said that social organization has helped their study centers.
- 25. 12% of beneficiaries have very good relation with neighbours, 58% of the beneficiaries have good relation with neighbours, 13% have moderate relation with neighbour and the rest of the 7% has indifferent relation with neighbours. Majority, 80% of the beneficiaries said that they help their neighbours in various ways.
- 26. 89% of the beneficiaries used to watch various cultural programmes such as Theyyam, Drama, Thiruvathorakali etc.

- 27. 96% of the beneficiaries felt there is a need to react against injustice and crime. Similarly with regard to participation in public function, 75% participate in the public functions.
- 28. 95% used to celebrate the days of national importance. 78% of the beneficiaries were members of some of the cultural organizations.
- 29. 56% of the beneficiaries were found to treat themselves when they are ill. The data showed that major part 51% were dependent on Allopathic treatment, 15% on homeo treatment 29% on Ayurveda, 5% on naturopathy. Interestingly, 64% of the beneficiaries keep a separate account for health care.
- 30. 94% of the beneficiaries were aware of environmental pollution.
- 31. 51% of the beneficiaries make sure that they eat nutritious food. 97% of the beneficiaries include meat, fish, egg, milk and fruits along with vegetables as a part of their diet.
- 32. The study revealed that 64% of beneficiaries are aware of population explosion. Interestingly, 84% of the beneficiaries believe in small family norm. Also, 92% of the beneficiaries have positive attitude towards family planning, 7% of the beneficiaries have negative attitude towards family planning and 1% of the beneficiaries have no knowledge about family planning
- 33. 86% of the beneficiaries have participated in awareness classes. The 76% of the beneficiaries participated in community development programme.

- 34. 67% of the beneficiaries participate in Gramasabha.8% of the beneficiaries considers the children as a burden family who does not spend money for the family, 2% agreed that such members are there in the family. 66% of the beneficiaries tried to change the negative activities of the young generation.
- 35. 51% of the beneficiaries engage in social work.
- 36. 92% of the beneficiaries were aware of the events taking place in the world.
- 37. 89% of the beneficiaries were aware about Life Quality Improvement Programmes conducted under their Continuing Education Centre.
- 38. 91% beneficiaries believe in superstitions. But 89% of the beneficiaries were against abortion of girl child. Also 90% were aware of the value system existing in India.

Implications of the Study

- 1. The study revealed that people are getting benefits from Continuing education programmes. So it is better to take necessary action to increase the number of Continuing Education Centres in Kerala and enhance the number of beneficiaries.
- 2. The importance of Continuing Education is not fully established among the people. So adequate priority should be given to raise awareness about Continuing Education and its importance among the people of the society through various awareness programmes.
- 3. The study revealed that the beneficiaries are not provided with enough journals, periodicals and study materials. So,

initiate necessary steps to provide a number of study materials periodicals and journals to the beneficiaries of the CEP which will help them to increase their general awareness and competitiveness

- 4. Lack of fund is also affecting the operations of Continuing Education Centres. It is the responsibility of the authorities to ensure smooth flow of adequate fund to these centres as finance is the life blood of every institution. And it is important to check that these funds are utilizing effectively for the betterment of the beneficiaries.
- 5. Only 5% of the beneficiaries are using biogas plant. Continuing Education Centres can organize various seminars to increase the awareness about the use of biogas plants, solar energy, watershed management, prevention of environmental degradation, etc among its beneficiaries.
- 6. With respect to the spending habit of the beneficiaries, it is identified that 65% of them are spending more than their income and 19% have developed the saving habits which means they are lacking financial management skills. Continuing Education Centres should also provide these skills to them which ensure financial stability and saving mentality in their entire life time.
- Around 49% of the beneficiaries of the CEP are not doing any social work. But CEPs should have to cultivate social responsibility among its beneficiaries. They need to change their curriculum and teaching in that way.

Conclusion

Education plays a key role in the development of the society. The beneficiaries of continuing education programmes are supposed to take care in their children's studies. Most of the beneficiaries said that career guidance programmes were conducted for their children in their continuing education centres. The findings of this study showed that the Continuing Education Programmes provide various activities for Equivalency Education, Income Generation, Quality of Life Improvement and Individual Interest Promotion have significant influence on the rural beneficiaries. In the present study shows that the Continuing Education Centres and their programmes influence the empowerment of the rural beneficiaries. These centres are contributing much to the financial, social educational and political development of the beneficiaries. This is the right time to orient and motivate the higher education institutions and universities to to undertake the socially relevant projects for the illiterates and neo-literates of the continuing education centers and rural development mechanisams.

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ECONOMIC EMPOWERMENT OF PEOPLE WITH DISABILITIES: CERTAIN PROSPECTS

Dr. R. Vijaya Anuradha*

Abstract

Disability is the outcome of complex interactions between the functional limitations arising from a person's physical, intellectual, or mental condition and the social and physical environment. It has multiple dimensions and is far more than an individual health or medical problem (DFID, 2000). Persons with disabilities on average as a group are more likely to experience adverse socioeconomic outcomes than persons without disabilities, such as less education, worse health outcomes, less employment, and higher poverty rates (World Bank, 2011). The United Nations World Health Organization, together with the World Bank, published the World Report on Disability in 2011, which found that 15.3% of the world's population has a "severe or moderate disability," while 2.9% has a "severe disability" (WHO and WB, 2011). A country's economic, legislative, physical, and social environment may create or maintain barriers to the participation of people with disabilities in economic, civic, and social life. Barriers include inaccessible buildings, transport, information, and communication technology; inadequate standards, services, and funding for those services; and too little data and analysis for evidence-based, efficient, and effective policies.

This paper focuses on the employment aspect, which is a key factor in the process of empowerment and inclusion of people with disabilities into mainstream society. They remain disproportionately undereducated, untrained, unemployed, underemployed, and poor—especially women, youth, and those in rural areas. The development of human resources, through skills development and inclusive training strategies, is crucial in facilitating the inclusion process. Transforming these disabled people in to a performing member of the society, enjoying economic empowerment is possible if we can transform them in to entrepreneurs so that they can earn their livelihood and live with self respect. This helps to create confidence, increase their self-esteem, upgrades socio-economic status and promotes recognition of and respect for disabled people's rights. Economic Empowerment of people with disabilities can be achieved by three ways, such as: through vocational skills development; through self-directed employment; and through formal sector employment.

Key Words: Economic empowerment, disability, worse health outcomes, less employment, higher poverty rates, self-esteem, socio-economic status, etc.

* Assistant Professor, Indian College of Education, Katpadi, Vellore – 14, (E-mail: anu2599@ gmail.com), Mobile: 07200111462

Introduction

Defining disability is complex and controversial. Though arising from physical or intellectual impairment, disability has health as well as social implications. A full understanding of disability recognizes that it has a powerful human rights dimension and is often associated with social exclusion, and increased exposure and vulnerability to poverty. Disability is the outcome of complex interactions between the functional limitations arising from a person's physical, intellectual, or mental condition and the social and physical environment. It has multiple dimensions and is far more than an individual health or medical problem (DFID, 2000).

Any study on disability has to deal with the challenges of defining and measuring disability because different conceptual models have been developed to define disability. In the medical model, disability is considered to be a problem of the individual that is directly caused by a disease, an injury or other health conditions, and that requires medical care in the form of treatment and rehabilitation. An individual with any impairment is considered disabled, irrespective of whether the person experiences limitations in his or her life activities due to the impairment, where impairment is the term used for an individual's condition (e.g. deaf, blind). In contrast, the social model considers disability purely as a social construct. Disability is not the attribute of an individual; rather it is created by the social environment and requires social change. An individual with impairment may not be able to find work not because of his or her inability to work per se, but as a result of inaccessibility of work

places or discrimination (Mitra and Sambamoorthi, 2006).

Statistics on Disabilities

One billion people, or 15 percent of the world's population, experience some form of disability. One-fifth of the estimated global total, or between 110 million and 190 million people, encounter significant disabilities. Persons with disabilities on average as a group are more likely to experience adverse socioeconomic outcomes than persons without disabilities, such as less education, worse health outcomes, less employment, and higher poverty rates (WB, 2011).

According to the United Nations, about 10% of the world's population have a disability, and in addition, the World Bank estimates that one fifth of the world's poorest people have a disability (Elwan, 1999). Not only do people with disabilities experience disproportionately high rates of poverty, but being poor increases the likelihood of disability. Those living in chronic poverty often have limited access to land, healthcare. nutritious food, shelter, education and employment. Furthermore people in chronic poverty often live and work in hazardous conditions. All these factors can predispose to disability. The United Nations World Health Organization, together with the World Bank, published the World Report on Disability in 2011, which found that 15.3% of the world's population has a "severe or moderate disability," while 2.9% has a "severe disability" (WHO and WB, 2011). The report adds that disability is generally most prevalent among people aged 60 years and older. According to the report, the disabled population experiences higher illiteracy and unemployment rates than the general

population (IDB, 2006). These factors, together with the difficulties specific to getting around, result in less mobility for people with disabilities, perpetuating a vicious circle of marginalization and poverty that is hard to break without the support of a public policy in their favour.

A country's economic, legislative, physical, and social environment may create or maintain barriers to the participation of people with disabilities in economic, civic, and social life. Barriers include inaccessible buildings, transport, information, and communication technology; inadequate standards, services, and funding for those services; and too little data and analysis for evidence-based, efficient, and effective policies. Poverty may increase the risk of disability through malnutrition, inadequate access to education and health care, unsafe working conditions, polluted environment, and lack of access to safe water and sanitation. Disability may increase the risk of poverty, through lack of employment, lower wages, and increased cost of living with a disability (World Bank, 2011). Some of the harsh facts (CNDD, 2006) are:

- Ten percent of the world's population has a disability, with 70% living in developing countries.
- People with disabilities are disproportionately represented among the poorest of the poor, comprising 20% of this group. It is not the impairment per se creating poverty and dependency in people with disabilities, but their exclusion from mainstream social, economic and political opportunities.
- Only 2% of persons with disabilities have access to rehabilitation and appropriate basic services.

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- Only 1-2% of children with disabilities in developing countries receive education.
- Mortality of children with disabilities can be as high as 80% even in countries where overall under-five mortality is below 20%.

Disabilities and Discrimination

"Disabled people are not only the most deprived human beings in the developing world, they are also the most neglected. It is important to acknowledge that more than 600 million people in the world live with some form of disability. More than 400 million of them live in developing countries, often amidst poverty, isolation and despair. Not only are they typically the poorest of the poor, but they also need more money and help than able-bodied people to overcome their handicaps and attempt to live normal lives" (Sen and Wolfensohn, 2004).

According to the United Nations, one person in 20 has a disability. More than three out of four of these live in a developing country (Helander, 1992). More often than not, they are among the poorest of the poor. Recent World Bank estimates suggest they may account for as many as one in five of the world's poorest (Elwann, 1999). Disability limits access to education and employment, and leads to economic and social exclusion. Poor people with disabilities are caught in a vicious cycle of poverty and disability, each being both a cause and a consequence of the other. It is estimated that only 2% of people with disabilities in developing countries have access to rehabilitation and appropriate basic services (Leonardo, 1993).

Women with disabilities suffer a double discrimination, both on the grounds of gender and of impairment; their literacy rates are lower than their male counterparts. Recent UNESCO studies have suggested that only 1-2% of children with disabilities in developing countries receive an education. Boys with disabilities attend school more frequently than girls with disabilities (Lewis and Sygall, 1997). According to estimates by the World Health Organisation (2011), as many as 20 million women a year suffer disability and long-term complications as a result of pregnancy and childbirth. Disabled women, particularly those from poor rural villages, lead an existence of extreme subservience, with very little control over their lives and face discrimination and abuse not only because of gender but also due to their disability (Hans and Patri 2003). The most common causes of motor disability are injuries from accidents on the road, at home, or the workplace; war and violence, including landmines; birth trauma; and infectious diseases such as polio and leprosy. Children are often disabled as a result of malnutrition. Children with disabilities are more likely to die young, or be neglected, malnourished and poor. People with disabilities who are denied education is then unable to find employment, driving them more deeply into poverty. Breaking out of the vicious cycle of poverty and disability becomes more and more difficult

A large proportion of disability is preventable. Social and human development will undoubtedly reduce the levels of disability in many poor countries. However, general improvements in living conditions will not be enough. Specific steps are still required, not

only for prevention, but also to ensure that people with disabilities are able to participate fully in the development process, obtain a fair share of the benefits, and claim their rights as full and equal members of society. Poor nutrition, dangerous working and living conditions, limited access to vaccination programmes, and to health and maternity care, poor hygiene, bad sanitation, inadequate information about the causes of impairments, war and conflict, and natural disasters all cause disability. Many of these causes are preventable. Improved water supply and sanitation, decreased exposure to environmental hazards, better nutrition, conflict prevention, and safer transport are all examples of other areas where support can help prevent disability.

Relationship between Poverty and Disability

Disability is both a cause and consequence of poverty. Eliminating world poverty is unlikely to be achieved unless the rights and needs of people with disabilities are taken into account. As many as half of the impairments experienced by people with disabilities are preventable, and are directly linked to poverty (DFID, 2000). Poverty limits the chances for people to lead full lives and to improve their lives: very few people with disabilities have access to rehabilitation and appropriate basic services (Leandro Despouy, 1993). Poverty in a community also makes the implementation of the most basic services difficult, and the fulfillment of fundamental and basic human rights such as the right to life, food, education, and health care, a distant dream. A review of the literature on the relationship between poverty and disability reveals the following facts:
- Persons with disabilities comprise 20% of the 'poorest of the poor' in the world (World Bank).
- At least 70% of persons with disabilities live in developing regions (UN).
- Only 2% of persons with disabilities have access to rehabilitation and appropriate basic services (UNHCHR).
- Only 1-2% of children with disabilities in developing countries receive education (UN).
- Mortality of children with disabilities can be as high as 80% even in countries where overall under-five mortality is below 20% (UK DFID).
- Persons with disabilities are extremely vulnerable in situations of conflict (UK DFID).
- The special needs of persons with disabilities are often overlooked in relief operations (UK DFID).
- Over 30% of all impairments are caused by malnutrition and infectious diseases (UN).
- There are approximately 15,000-20,000 new landmine casualties each year, survivors of landmine explosions often have long term disabilities (ICBL).

Of the estimated over 600 million persons with disabilities worldwide (about 10% of the world's population), 70 per cent live in developing countries, and according to UN statistics, 82 per cent live below the poverty line (Hope, 2003). The World Bank estimates that persons with disabilities comprise about 20% of the poorest of the poor (Elwan, 1999). People with disabilities are identified as "the poorest of the poor....More than 1.3 billion people worldwide struggle to exist on less than \$1 a day and the disabled in their countries live at the bottom of the pile" (Wolfensohn, 2002). Poverty and disability are interrelated. Poor people are more likely to have a disability because of the conditions in which they live. Disability is likely to make people poorer because of limited opportunities and discrimination (Peat, 1998). Therefore, people with disabilities and their families are clearly a major cohort of this very vulnerable population.

Impact and Consequences of Disabilities

Disability does not just affect the individual, but impacts on the whole community. The cost of excluding people with disabilities from taking an active part in community life is high and has to be borne by society, particularly those who take on the burden of care. This exclusion, often leads to losses in productivity and human potential. The UN estimates that 25% of the entire population is adversely affected in one way or another as a result of disabilities (Leonardo, 1993). People with disabilities face numerous barriers in realizing equal opportunities; environmental and access barriers, legal and institutional barriers, and attitudinal barriers which cause social exclusion. Social exclusion is often the hardest barrier to overcome, and is usually associated with feelings of shame, fear and rejection. Negative stereotypes are commonly attached to disability. People with disabilities are often assigned a low social status and in some cases are considered worthless.

The consequences are particularly severe for women with disabilities who are also subject to social, cultural and economic disadvantages due to gender discrimination. Studies show that women with disabilities are two to three times more likely to be victims of physical and sexual abuse than women with no disabilities. Their access to reproductive health care is minimal and as a result they suffer greater vulnerability to reproductive health problems. There is a lack of awareness regarding women with disabilities and reproductive health needs. Moreover, a woman may become disabled due to an abuse of her rights. It is estimated that over 100 million girls and women in more than 28 countries in Africa alone are disabled as a result of female genital mutilation. The physical and psychological consequences of these practices range from mobility difficulties, impaired sexual function and infertility because of infection, to an increased risk of HIV infection (UNESCO, 1995). In many developing countries women are assigned a low status, socially, economically and politically. Girls and women with disabilities are left marginalized, neglected and are often considered a burden

Children are another vulnerable group. Mortality for children with disabilities may be as high as 80% in countries where underfive mortality as a whole has decreased to below 20%. Children with disabilities requires a significant focus to ensure prevention, early intervention, timely rehabilitation, access to education, recreation, and social integration leading to their full inclusion in society as children and then later as adults. Disabled children require adequate support and opportunities for appropriate responses and assistance, including integration into mainstream society. This will consequently lessen the burden of disability (Hariss-White, 1999).

Employability and Inclusion of People with Disabilities

Employment is a key factor in the process of empowerment and inclusion of people with disabilities into mainstream society. They remain disproportionately undereducated, untrained, unemployed, underemployed, and poor-especially women, youth, and those in rural areas. Persons with disabilities have unique differences and abilities. They require the same education, vocational training, employment, and business opportunities as others. Some may require specialized support services, assistive devices or job modifications, but these are all small investments compared to lifetimes of productivity and contribution. The development of human resources, through skills development and inclusive training strategies, is crucial in facilitating the inclusion process. Ministries of employment may need encouragement to take into account the training needs of people with disabilities, and to consider formulating legislation and adopting labour standards which respect the rights of people with disabilities to employment and income generation schemes.

In both developed and developing countries, promoting more inclusive societies and employment opportunities for people with disabilities requires improved access to basic education, vocational training relevant to labour market needs and jobs suited to their skills, interests and abilities, with adaptations as needed. Many societies are also recognizing the need to dismantle other barriers, making the physical environment more accessible, and providing information

in a variety of formats, and challenging attitudes and mistaken assumptions about Persons with Disabilities (PwDs). The 'invisibility and isolation' of people with disabilities are caused by stigma, discrimination, myths, misconceptions, and ignorance. Only by a thorough analysis of this experience from research, evaluation, and input from people with disabilities can society build a sound understanding and development strategy (Elwan, 1999). It is not only rights that are wanted, nor is it simply access to "social and medical" services. People with disabilities and their families want and deserve what other members of their community have-their rightful place as citizens. Strategic and results-oriented programming must be introduced and managed to address the issues affecting people with disabilities. This requires mainstreaming the issues affecting people with disabilities in both sector wide and specific programming. Mainstreaming disability through a targeted and resultsoriented strategy addresses the needs of people with disabilities as a unique constituency. It ensures that people with disabilities have the same access to basic and essential services and infrastructure as others.

Coleridge (2007) asserts that one of the primary issues to consider is the need to build confidence, because disabled people are often disadvantaged by negative assumptions about their abilities and potential within their families and communities. He suggests that these assumptions can become internalized by disabled people and lead to low expectations, which need to be addressed by developing positive attitudes, knowledge and

life skills. The needs of people with disabilities and their families must be identified and addressed in a manner consistent with and reflective of their dynamic qualities, capacities, vulnerabilities, and expectations. Community-based, integrated, accessible, and participatory principles and strategies for development, building on local capacity, need to replace the inadequacy of past exclusionary and specialized institution-based, paternalistic services (Coleridge 1993; Peat 1997; Elwan 1999; Edmonds 2002b; Wiman, Helander, and Westland 2002). Strategic and resultsoriented programming must be introduced and managed to address the issues affecting people with disabilities.

Removing barriers and creating opportunities to access all services and resources within a community are essential for inclusion of people with disabilities. Access requires that people with disabilities and other stakeholders are informed and aware of the issues and able to make decisions based on the best available information. Also, services and resources reach the most vulnerable in rural and urban communities, and reach all people with disabilities, irrespective of age, sex, ethnicity, religion, geography, language, and disability. Further, the built environment and systems of communication should be barrier free and follow universal design and accommodation measures.

Economic Empowerment of People with Disabilities

The needs of people with disabilities are rarely addressed within the majority of development initiatives implemented worldwide. The needs of disabled people

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could become a more important component in operations when they are included in the initial analysis for policy programming. Creating a world where people with disability have economic empowerment is our mission. People suffering from mental illness have been ignored, abused, neglected and are considered a burden to the society. They have not been able to enjoy any human rights. Many spend their days in inhuman conditions. Economic empowerment increases their confidence and helps them to recover. Transforming these disabled people in to a performing member of the society, enjoying economic empowerment is possible if we can transform them in to entrepreneurs so that they can earn their livelihood and live with self respect. This helps to create *confidence*, increase their self-esteem, upgrades socioeconomic status and promotes recognition of and respect for disabled people's rights. It also makes the people aware of the immense potentialities that each individual is possessing and helps an individual to respect human being irrespective of their caste, creed and disabilities. Economic Empowerment of people with disabilities can be achieved by three ways, such as –

- Economic empowerment through vocational skills development
- Economic empowerment through selfdirected employment
- Economic empowerment through formal sector employment
- Economic Empowerment through Vocational Skills Development

Vocational training and rehabilitation strategies for disabled people were first emerged in the United States, when

rehabilitation services were offered to US war veterans after the First World War (Metts, 2000). The mismatch between the content of training provided by segregated institutions and the requirements of local labour markets has led many to call for a more integrated approach to vocational skills development, which makes use of mainstream training programs. O'Reilly notes the gradual transition from segregated institutions to mainstream programmes for disabled people. However, he observes that this transition is much slower in developing countries, for reasons such as "physical inaccessibility of training centres, distant or inconvenient location of training, courses which are not relevant, inadequate transportation, unavailability and/or cost of child care, little flexibility in course design or delivery" (2007, p84).

On the whole, one of the main lessons to be learned is that disabled people are likely to need a wide range of vocational skills, including life or personal skills that equip them to overcome the negative attitudes and discrimination that they are likely to have faced throughout their lives. The precise combination of skills required needs to be matched to the requirements of local employment markets. In terms of approach, inclusive strategies are generally favoured, particularly those that involve employers in some way, although disabled people are likely to face many barriers in accessing mainstream training provision. There is also some doubt, as to the relevance and suitability of some inclusive training programmes that are currently operating in developing countries.

1. Economic Empowerment through Self-directed Employment

Self-directed employment refers to individuals running their own businesses, either individually or in collaboration with others (Neufeldt, 1995). This concept, as Neufeldt explains, includes business ventures started by disabled individuals, but may also include family businesses, where one or more family member has a disability, worker cooperatives involving disabled people or even businesses run by DPOs, which provide employment for their disabled members. While self-directed employment may not offer the security and stability of waged employment, it does offer the flexibility of being able to work at one's own pace, and often at home, which, as Moodie (2010) points out, may well suit many disabled people. This type of employment also allows for others to fill gaps in the supply chain, thus enabling entrepreneurs to overcome limitations that may arise due to the nature of their particular impairments. Coleridge (2007) observes that business ventures of this type are most likely to operate in the informal sector, at least initially, and hence may provide some of the best employment opportunities for disabled people in countries where the informal sector dominates.

The need for a holistic approach to supporting disabled people along the road to economic empowerment, through selfdirected employment, is also demonstrated by a more recent global study on economic inclusion, carried out by Handicap International in 2006, based on field visits to seven countries in Asia and East Africa (including Kenya and India). The study report concludes that successful strategies for promoting self-employment among disabled people require "complementary activities in multiple sectors" (p. 24). These activities include *physical rehabilitation, building self-esteem, raising disability awareness and advocacy services*, as well as developing business skills and facilitating access to financial services. The most costeffective way of providing such comprehensive support, the report suggests, is to establish partnerships between organizations working in different domains.

2. Economic Empowerment through Formal Sector Employment

There appears to be a growing international consensus that disabled people should not be excluded from the open employment market. This was clearly stated in ILO Convention No. 159, back in 1983, which aims at "promoting employment opportunities for disabled persons in the open labour market" (Article 3), and is also an important theme of the UNCRPD, which calls on Governments to protect the employment rights of disabled people through legislation. Some countries are clearly heeding these international calls, and have measures in place to increase the participation rates of disabled people in the formal sector, such as quota schemes and incentives for employers.

The increasing international recognition of disability rights and the spread of prodisability employment legislation should provide encouragement for disabled people to at least consider the formal sector as a possibility. However, Dube et al., report that "despite these efforts at international and national level, there has been modest impact on the lives of disabled people" (2005, p10). This conclusion is based on their own research findings, which show that disabled people feel that legislation is either not mandatory, has inadequate penalties for noncompliance or ineffective enforcement mechanisms. They also report a lack of resources allocated to the implementation of pro-disability legislation. This view is supported by O'Reilly (2007), who also points out that high unemployment rates and economic difficulties in many countries are making these measures hard to implement. It is not surprising, given these arguments, that labour market participation rates remain "considerably below average" (ILO, 2008). O'Reilly (2007) suggests that non-obligatory measures, based on persuasion or selfregulation, should be used in addition to legislation. For example, government agencies or employer associations could make awards to employers for offering employment opportunities to disabled people. The World Disability Report also recognizes this issue, and states that "more research is needed to understand which measures improve labour market opportunities for people with disabilities, and are cost-effective and sustainable" (WHO and World Bank, 2011, p240).

Concluding Remarks

Non-discrimination in all spheres lies at the heart of the Constitution of India. The nodal PWD Act envisages equal opportunities and full participation to persons with disabilities. Yet disabled people continue to be excluded and marginalized. To overcome this, it is necessary to adapt some policy planning such as:

- Improve the disability data collection, analysis and its application to inform policy and programming. Invest in the collection, analysis and utilization of valid, reliable and relevant disability data, covering all aspects of disability including
 impairments, activity limitations, participation restrictions, and related health conditions, environmental factors
 in order to construct a complete picture of disability and functioning to ensure that policies and programmes are based on evidence.
- The attitude of people at large need to be changed, from excluding the people with disabilities in all spheres of life and also to provide compulsory barrier-free access to all public buildings, spaces and transport.
- Incorporating a rights approach into policymaking, rather than a charity or welfare approach and consulting disabled people when formulating policies and legislation for the disabled.
- Reducing the huge rural-urban divide by mainstreaming the disabled into all development programmes and stricter implementation of the provisions of the PWD Act in education and employment, and ensuring that special resources are available for the same.
- Legal, regulatory and other barriers that block access to appropriate and affordable assistive devices need to be overcome, and appropriate and effective systems for the development, production, distribution and servicing of assistive devices and equipment should be established.

• Better diagnostic tools for early detection and treatment of disabilities, and greater availability of aids and technical support. Make health care, including rehabilitation services and assistive devices affordable.

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MISCONCEPTIONS IN MATHEMATICS OF SECONDARY SCHOOL STUDENTS WITH SPECIAL REFERENCE TO LEARNING STYLES

Beenamma Mathew* Dr. Celene Joseph**

Abstract

The study aimed to find out the misconceptions in mathematics of secondary school students with special reference to their learning style preferences. It is a descriptive study on a sample consists of 409 eight standard students belonging to three districts of Kerala state. The descriptive statistics Mean and Standard Deviation and the inferential statistics ANOVA were used for analyzing the data. The tools used in the study were Geometry Misconception Identification Test and Learning Style Inventory prepared by the investigators. The study shows that each student has unique learning styles. The gender does not influence the misconceptions in Mathematics but the Learning Style preferences affect misconception in Mathematics.

Key Words: *Misconceptions in Mathematics, Learning Styles, Visual learners, Auditory learners, Reading/writing-preference learners, Kinesthetic learners or tactile learners, etc.*

Introduction

Mathematics is a contributing factor in the rapid progress and prosperity of mankind. It is the pivot of all civilizations. Mathematics is that subject which indisputably forms the very basis of entire world commercial system. It is a contributory factor in the prosperity of human race. There is no science, no art and no profession where mathematics does not hold a key position. The accuracy and exactness of a science is determined to a major extent by the amount of mathematics utilized in it.

In the present day competitive world, success and knowledge go hand in hand. Krishnamurthy (1990) while discussing the importance of mathematics says that the mathematical form of today has more and more new applications for day to day life and the rapid growth of desired applications helps to develop more and more new fields of mathematics.

* Research Scholar, Bharathiar University, Coimbatore. Email: beenammamathew@yahoo.co.in

** Associate Professor, St. Thomas College of Teacher Education, Pala. Email: pavithracelene@ yahoo.com The specific role mathematics has, highlights the role of mathematics education, especially mathematics learning. The national policy of education (1986) has considered the importance of mathematics in general education and suggests that mathematics should be visualized as the vehicle to train the child to think, reason, analyze and articulate logically. Attainment in mathematics is very much based on the mastery of skills. The present school curriculum demands rapid learning and clear understanding of frequently changing syllabus and new curriculum.

The students who are subjected to learning do not enter the class room with an empty head. Resnick (1983) reports that 'we may say many students do not come to the classroom as "blank slates". They have their own past experiences of their environment. What they experienced or what they understood in their pre-schooling period may not absolutely true in the eyes of a scientist. But actually they act as the pillar to build up their span of knowledge. The poor performance of students in different subjects and lack of motivation in learning is because of teacher's failure to give ample consideration to this aspect of learning. Since the present philosophy in the educational scenario 'the constructivism', centers on the learner, his/her abilities and contributions, one of the main focuses for better learning is the pre conception or prior knowledge of the learner. If there exists any misconception in their prior knowledge the acquisition of new knowledge is impossible especially in the case of Mathematics.

Another contemporary issue in education is the learning styles of students.

Classroom teachers desiring to maximize their students' learning must understand the Learning Styles preferences of their students. Because every classroom consists of individuals with diverse strengths, backgrounds and approaches of learning, understanding and responding to each student's individual Learning Style can be challenging for teachers. But to give learner friendly environment and to reduce stress and strain of students, teachers must provide activities tune with their way of learning. So it is wise to know about the role of misconception and Learning Styles in the teaching learning process of Mathematics.

Misconception

A misconception is a mistaken idea or view resulting from a misunderstanding of something. Rather, they come with informal theories constructed from everyday experiences. These theories have been actively constructed. They provide an everyday functionality to make sense of the world but are often incomplete half-truths (Mestre, 1987).

Smith et al. (1993/1994) noted, there are many versions of the perspective that students' conceptions are different from scientists'. The students' conceptions are referred to variously as *preconceptions*, *alternative conceptions*, and *misconceptions*. The core idea of *misconceptions* are :

- 1. strongly held, stable cognitive structures
- 2. differ from expert conceptions
- 3. affect in a fundamental sense how students understand natural phenomena and scientific explanations and

4. must be overcome, avoided, or eliminated for students to achieve expert understanding.

Hestenes (1994) opinion that some consider the term *misconceptions* to refer only to the phenomenology of patterns in students' responses that are inconsistent with expert understanding. This use of the term does not posit cognitive structures or any other explanation for the observed patterns; it simply notes the patterns' existence.

Formation of misconceptions

Senses are the gateways of knowledge. Senses gather data by interacting with and observing environment by using senses. Wolf (1998) explains the procedure behind the formation of misconception. "As children begin to make sense of their natural world, they start by observing and interpreting phenomena. These experiences are processed and recorded in various parts of the brain- in the visual, auditory and motor cortices, not just in one specific place." Children develop an understanding about the world around them by making observation of the objects, events and phenomena and conducting inquiry and discovery. They interpret their sensory experience and try to find meaning for them by formulating their own understanding. These ideas may not be correct in the scientist's point of view. This interpretation may be sometimes based on deductive reasoning. If the major premise used for deductive reasoning is not correct, the conclusion derived also will not be correct. Dougless Llewellyn (2007) explains this process as "Children attempt to filter out all experience that does not fit with presently held beliefs. Children are personally and emotionally attached to their beliefs and do

not easily give them up. The authority of the teacher may not be strong enough to change many of the misconceptions held by the students". Misconceptions can come from all the sources of data gathering and from the ways of thinking. These may form even as a consequence of carelessly planned learning experiences. Misconceptions are not only among school-age children. Even after several years of instruction, adults maintain incorrect ideas about scientific phenomena.

Learning styles

Learning Style is a student's consistent way of responding to and using stimuli in the context of learning. Keefe (1979) defines Learning Styles as the "composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment." Stewart and Felicetti (1992) define Learning Styles as those "educational conditions under which a student is most likely to learn." Thus, learning styles are not really concerned with "what" learners learn, but rather "how" they prefer to learn. Marlene D. Lefever (2004) viewed learning styles as 'A Learning Style is the way in which a person sees or perceives things best and then processes or uses what has been seen'. Each person's individual learning style is as unique as a signature. Students learn faster and enjoy learning more if their unique learning styles are affirmed.

Learning styles help us to discover the different forms of mental representations; however, they are not good characterizations of what people are or are not like. They should not categorized students in different groups but help to identify their preference. The literature shows the extensive acceptance of the concept of learning styles (Coffield, et. al., 2004). To improve the learning and instructional process it is a need to use innovative instructional activities that relate to the diverse leaning styles of students.

David Merrill (2000) said that instructional strategies should first be determined on the basis of the type of content to be taught or the goals of the instruction (the content-by-strategy interactions) and secondarily, learner styles and preferences are then used to adjust or fine-tune these fundamental learning strategies. Finally, content-by-strategy interactions take precedence over learningstyle-by-strategy interactions regardless of the instructional style or philosophy of the instructional situation. Merrill continued with the argument that most students are unaware of their learning styles and if left to their own means, they are unlikely to start learning in new ways. Thus, knowledge of one's learning styles can be used to increase self-awareness about their strengths and weaknesses as learners. In other words, all the advantages claimed for metacognition (being aware of one's own thought and learning processes) can be gained by encouraging learners to become knowledgeable about their own learning and that of others (Coffield, 2004).

There has been a great deal of research on learning styles over the last 60 years. The leading researchers in this field are Anthony Gregorc, Dunn and Dunn, Howard Gardner Niel D. Fleming, David Kolb, Honey and Mumford etc. in this study we discuss about Neil D.Fleming's Leaning Styles.

Neil D.Fleming's VARK Model

One of the most common and widelyused categorizations of the various types of learning styles is Fleming's VARK model which expanded upon earlier Neuro-linguistic programming (VAK) models. Fleming (1983) identifies that the learners have four learning preferences:

- 1. Visual learners
- 2. Auditory learners
- 3. Reading/writing-preference learners
- 4. Kinesthetic learners or tactile learners

Fleming claims that visual learners have a preference for seeing (think in pictures; visual aids such as overhead slides, diagrams, handouts, etc.). Auditory learners best learn through listening (lectures, discussions, tapes, etc.). Tactile/kinesthetic learners prefer to learn via experience—moving, touching, and doing (active exploration of the world; science projects; experiments, etc.). Its use in pedagogy allows teachers to prepare classes that address each of these areas. Students can also use the model to identify their learning style and maximize their educational experience by focusing on what benefits them the most.

Need and significance of the study

It is generally believed that mathematics is an exceptionally difficult subject and hence its study requires special ability and intelligence. It is also seen that more than ninety percent of failure at the secondary school level are due to poor performance in mathematics. However several research studies reveal that learning of mathematics can be made easier and enjoyable through the coordinate effort of teachers, students, parents, educational researchers, psychologists and mathematicians. Hence it is a need to give vital importance to mathematics learning.

The present status of mathematics learning also shows that students commit a lot of mistakes while solving problems. This may be due to lack of various skills, lack of enough practice and inability to attain the various concepts in its right sense. It is a fact that there are lots of misconceptions among students, while learning mathematics. Hence the investigator is motivated to undertake the task of understanding misconceptions

In addition to this the psychological concept of 'Learning Style' caught the attention of the investigators. Studies show that each individual has a particular learning style and if the techniques and methods selected to support maximum learning cope with the learning style of the learner, it enhances learning, motivates the learner and removes the dryness experienced by the learner. Thus the above mentioned components together bring out the present study.

Objectives of the study

- 1. To find out the Misconceptions in Mathematics prevailing among Students of Standard Eight.
- 2. To find out the preferred Learning Styles of Students of Standard Eight
- 3. To find out the distribution of Misconceptions in Mathematics of Students of Standard Eight with respect to Learning Style preferences
- 4. To find out the difference in Misconceptions in Mathematics of Students of Standard Eight based on gender

5. To find out the difference in Misconceptions in Mathematics of Students of Standard Eight based on Learning Style preferences

Hypotheses

- 1. There is significant difference between the means of Misconception Scores in Mathematics among male and female students of standard Eight.
- 2. There is significant difference between the means of Misconception Scores in Mathematics based on Learning Styles preferences

Methodology

The method adopted for the present study which is designed to investigate the Learning Styles preferences and Misconceptions in Mathematics of secondary school students is descriptive survey.

Tools used

The instruments used in this study were 'Geometry Misconception Identification Test' and 'Learning Style Inventory' prepared by the investigators. The Geometry Misconception Identification Test consists of 25 items and each item has three tiers. The first tier consists of multiple choice questions with four distractors to check their achievement (correct answer or misconception). The second tier provides chances to give the descriptive reasons for their answers. It consists of 5 options were one is open ended or blank for free expression of students. The other four options include correct reasons and misconceptions. The third tier is to check the certainty of the misconception, which include two options i)

I am sure of the answer and ii) I am not sure of the answer. If a student chooses the choice indicating misconception in the first two tiers and 'I am sure of the answer' for an item in the third tier then, that is considered as a misconception. The second tool the Learning style Inventory consists of 24 items. Each item consists of a situation on the selected components and then offers four extension statements all correct, which correspond closely each to one of the four learning styles mentioned above. The category having highest score is considered as the preferred learning style of the learner. Here the maximum score of each category is 24 and the minimum score is 0. The tryout of the tool showed that some students have highest score for more than one category of learning styles. The investigators classify these students as 'Others' in this study.

Sample for the study

The sample of the study covers 409 Students of Eight Standard following Kerala state syllabus. The students were selected randomly from aided and government schools of the three districts, Kottayam, Idduki and Ernakulam.

Analysis and interpretation

The analysis of the data and the interpretation of the results are given below.

The distribution of Misconception scores in Mathematics

To find out the distribution of misconceptions in mathematics the investigators used the frequency distribution table of misconception scores and the descriptive statistics Mean, Standard deviation and Skewness. Table 1 shows the frequency distribution and Table 2 describes the descriptive statistics.

Table 1

Distribution of Misconception scores in Mathematics of Students of Standard Eight

Class interval	Frequency	Percentage		
0-4	149	36.43		
5-9	202	49.39		
10-14	54	13.20		
15-19	4	0.98		
Total	409	100		

Table 2

Estimated Misconception Scores in Mathematics of Students of Standard Eight

Num ber	Mean	S.D	Skew ness	Mini mum	Maxi mum
409	5.92	3.31	.499	0	18

Tables 1&2 together explain that the minimum and maximum of misconception scores are 0 & 18 respectively. 202 (49.39%) students fall in the class interval 5-9, which is the highest frequency class interval. 36.43% have misconception scores below 5, and 14.18% have misconception scores above 9. From the Table 2 the investigators observe that the mean value is 5.92 and skewness is .499, which shows that most of the students have low misconception scores or they have less Misconceptions in Mathematics.

The Learning Style Preference among Students of Standard Eight

To find out the Learning style preferences of Students of Standard Eight the investigator prepared the frequency distribution table using Learning Style inventory scores. The Table 3 gives the frequency distribution of learning styles preferences.

Table 3

Distribution of the Learning Style preference of Students of Standard Eight

Learning	No.of	
styles	Students	%
Visual	45	11.0
Auditory	79	19.3
Reading/Writing	134	32.8
Kinesthetic	93	22.7
Others	58	14.2
Total	409	100.0

The Table 3 reveals that 32.8 % of the students belong to the Learning Styles Preferences group Reading/Writing and they form the largest of Learning Styles preferences group. The secondlargest is

KinestheticLearning Styles preferences group (22.7%), the third is Auditory Learning Styles preferences group(14.2%) and the fourth is Others – having multiple learning Styles preferences(14.2%). The smallest Learning Styles preferences group is Visual (11%).

The distribution of Misconception scores in Mathematics of Students of Standard Eight with respect to Learning Style preferences

To find out the distribution of Misconception scores in Mathematics of Students of Standard Eight with respect to Learning Style preferences, the investigators used the descriptive statistics Mean, S.D, Std. Error, 95% confidence Interval for Mean, Minimum score and Maximum score. The data and results are given in Table 4.

Table 4

Estimated Misconception Scores (MS) in Mathematics of Students of Standard Eight belonging to different Learning Style preferences group.

						95%	C.I for		
Learning	Ν	%	MS	S.D	Std.	Me	an	Mini	Maxi
Styles					Error	lower	upper	mum	mum
Visual	45	11.0	5.84	3.06	.46	4.93	6.76	1	14
Auditory	79	19.3	4.96	2.88	.32	4.32	5.61	0	17
Reading/Writing	134	32.8	6.13	3.35	.29	5.56	6.71	0	15
Kinesthetic	93	22.7	5.98	3.40	.35	5.28	6.68	0	15
Others	58	14.2	6.72	3.62	.48	5.77	7.68	0	18
Total	409	100.0	5.92	3.31	.16	5.60	6.25	0	18

N-Number of students,%-Percent, MS-Misconception Score, S.D-Standard Deviation, C.I-Confidence Interval

From Table 4 the investigators observe that students categorized as 'Others' who have multiple learning style preferences have the highest mean score for the Misconceptions in Mathematics and the auditory group has lowest mean score for the Misconceptions in Mathematics. The mean score ranges from 4.96 to 6.72. From this the investigators infer that the students who have multiple learning style preferences have higher mean score for Misconceptions in Mathematics and the Auditory learning style preferences students have the lowest mean score for Misconceptions in Mathematics.

The distribution of Misconception scores in Mathematics of Students of Standard Eight with respect to Gender

To find out the distribution of Misconceptions in Mathematics of Eight standard students with respect to gender the investigators used the descriptive statistics Mean, S.D, Std. Error, 95% confidence Interval for Mean, Minimum score and Maximum score. The data and results are given in Table 5.

Table 5

Estimated Misconception scores in Mathematics of Students of Standard Eight with respect to Gender

					95% C.I for Mean			
Gender	Ν	Mean	S.D	Std.	Lower	Upper	Mini	Maxi
				Error	Bound	Bound	mum	mum
Male	224	6.03	3.29	.22	5.60	6.46	0	17
Female	185	5.79	3.35	.25	5.31	6.28	0	18
Total	409	5.92	3.31	.16	5.60	6.25	0	18

Table 5 shows that the mean misconception score of male students is 6.03 and that of female students is 5.92. From this the investigators infer that Male students have higher mean score for Misconceptions in Mathematicscompared with female students.

Difference between the means of Misconception Scores in Mathematics with respect to Learning Style preferences

To find out the significance of difference between the means of Misconception

Scores in Mathematics with respect to Learning Style preferences the investigators formulated the following null hypothesis

 H_{01} : There is no significant difference between the means of misconception scores in mathematics with respect to Learning Style preferences. The null hypothesis H_{01} was tested using the statistical technique ANOVA. The level of significance was fixed at .05 with degrees of freedom 4/404. The Table 6 gives the estimated result

Table 6

Data and results regarding difference between means of Misconception Scores in Mathematics with respect to Learning Style preferences

Source of Variance	Sum of Squares	df	Mean Square	F	Р
Between Groups	116.73	4	29.18	2.704	.030
Within Groups	4359.92	404	10.79		
Total	4476.65	408			

Table 6 shows that the between groupssum of squaresis 116.73 and within groupssum of squares is 4352.92. The corresponding mean squares are 29.18 and 10.79 respectively. $F_{(4,404)=}2.704$, p<..005 is significant at .05 level. This reveals that the means of misconception scores of students

belonging to different Learning Style preferences are significantly different. The investigators used Post hoc (Bonferroni) comparison to find out the specific groups which differ significantly in misconceptions. The details are shown in Table 7

Table 7

Comparison of the Misconception scores in Mathematics of Different Learning Style Preference groups

Pairs of Learning	Mean Difference	Std.		95% Con Inte	fidence erval	
(I) Learning	(J) Learning	(I-J)	Error	Sig.	Lower	Upper
Styles	Styles			-	Bound	Bound
Visual		.88	.61	1.000	85	2.61
Visual	Reading/writing	29	.57	1.000	-1.89	1.31
Visual	Kinesthetic	13	.60	1.000	-1.82	1.55
Visual	Others	88	.65	1.000	-2.72	.96
Auditory	Reading/writing	-1.17	.47	.123	-2.49	.14
Auditory	Kinesthetic	-1.02	.50	.438	-2.44	.40
Auditory	Others	-1.76*	.57	.021	-3.37	16
Reading/writing	Kinesthetic	.16	.44	1.000	-1.10	1.41
Reading/writing	Others	60	.52	1.000	-2.05	.87
Kinesthetic	Others	75	.55	1.000	-2.30	.81

* The mean difference is significant at the 0.05 level.

Table 7 explains that the difference in Misconceptions in Mathematics is significant between students belongs to the Learning Style preference groups Auditory and Others. For all other pairs of Learning Style preference groups, the differences in means of Misconception scores in Mathematics are not significant.

Difference between the means of Misconception Scores in Mathematics with respect to Gender

To find out the significance of difference between the means of Misconception Scores

in Mathematics with respect to gender the investigators formulated the following null hypothesis

 H_{02} : There is no significant difference between the means of misconception scores in mathematics among the male and female students in eight standards. The null hypothesis H_{02} was tested using the statistical technique two tailed test of significance of difference between means for large independent groups. The level of significance was fixed at .05 with degrees of freedom 407. The Table 8 gives the estimated result. Table 8

Data and results regardingDifference between means of Misconception Scores in Mathematics with respect to gender

variable	gender	number	mean	Std. Deviation	Std. Error	df	t	Levels of significance
					Mean			
Misconception	Male	223	6.03	3.29	.22	407	.802	Not significant
	Female	186	5.79	3.35	.25			

It is observed from Table 8 that the mean and standard deviation of scores on misconception in mathematics of male students is 6.03 and 3.29respectively. Themean and standard deviation of scores on misconception in mathematics of female students is 5.79 and 3.35 respectively. The t-value is .802 with degrees of freedom 407. The t- value is not significant at .05 level. This reveals that the mean misconception scores of male and female students are not significantly different. The possibility to formulate misconceptions in Mathematics remains same for both the genders.

Findings of the study

- The distribution of misconception scores shows that the scores spread between the values 0&18, where the minimum score is 0 and the maximum score is 25. The mean of Misconception score in Mathematics is 5.92 and skewness is .499, which shows that most of the students have low misconception scores.
- 2. Students have different Learning styles. The order of domination is Reading/ Writing, Kinesthetic, Auditory, Others, and Visual respectively.
- 3. There is significant difference in the Misconception scores inMathematics between students belonging to different Learning Styles preference groups. The

significant difference in Misconception scores in Mathematics is between students belongs to the categories Auditory and Others(having multiple learning Styles preferences). For all other pairs the difference in Misconception scores in Mathematics is not significant.

4. There is no significant difference in Misconceptions in Mathematics between male and female students. The possibility to formulate misconceptions in Mathematics remains same for both the genders.

Conclusion

The study reveals that most of the students inour classrooms have misconceptions in Mathematics. Even though the number of misconceptions is less that may tremendously affect the assimilation of new information. Since one of the causes of bad performance in Mathematics is the silent play of misconceptions, teachers must be vigilant to identify the misconceptions and to adopt suitablestrategies not only to eradicate the existing misconceptions but also to keep student from formulating misconceptions. Teachers must be very careful in selecting examples, generating ideas and giving instructions in classrooms while teaching. Another remarkable information came out through this study is that each student has unique Learning styles preferences and the dominated learning styles among secondary school students is Reading/Writing. Meanwhile the effectiveness of classroom instruction to an extend depends upon how much it is in tune with the Learning Style Preferences, teachers must be interested in identifying the learning Styles of their students.

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St. Thomas College of Teacher Education, Pala, Kerala, India Website: www.stce-pala.info, www.stctepala.org email: educationalextracts@gmail.com

NUTRITIONAL KNOWLEDGE OF COACHES AND PHYSICAL EDUCATION TEACHERS IN KERALA

Pradeep C.S* Dr. T. I Manoj**

Abstract

Nutrition is a key component to athletic performance and a healthy lifestyle. As athletes grow and advance to more competitive sports, such as college level play, it is important that they maintain optimal health, and adequate dietary intake is essential towards achieving this goal. The purpose of this study was to better understand Kerala coaches and physical education teacher's nutritional knowledge. The subjects selected for the study was coaches and teachers in Kerala. The study focused on 140 physical education teachers and 140 coaches working under different schools and sports hostels in Kerala. The data collected will be analyzed using descriptive statistics by frequency distributions, percentage, means, and Standard Deviation, t- ratio and F-ratio, were conducted to determine the significant difference existed in the level of nutrition knowledge among them. The value of t- statistic is 10.24 and t-value is significant as the p-value is 0.000 which is less than 0.05. The overall nutrition knowledge scores for the physical education teachers are higher than that of coaches in Kerala.

Key Words: *Nutrition Knowledge, Physical Education, Coaches, Athletic Performance, Lifestyle, Dietary Habits, etc.*

Introduction

Nutrition is a key component to athletic performance and a healthy lifestyle. As athletes grow and advance to more competitive sports, such as college level play, it is important that they maintain optimal health, and adequate dietary intake is essential towards achieving this goal. During vigorous activity, nutrients are depleted throughout the body and athletes need a sufficient supply in order to perform and replenish nutrients. Certain foods are recommended before and after play to keep the body functioning adequately. Many athletes have inadequate dietary intake because it has been suggested that they lack the knowledge to make the right choices (Zawila, Steib, & Hoogenboom, 2003).

^{*} Principal, Govt. G.V.Raja Sports School, Thiruvananthapuram, Kerala. Mob: 9400911251. E-mail: drpradeepcs@gmail.com

^{**} Associate Professor & Head Dept. of Physical Education, Kerala Agricultural University, Thiruvananthapuram.

Nutrition is a major component in leading a healthy lifestyle, and it is essential that athletes have an understanding of nutrition, not only to optimize performance, but also to decrease health risks.

Various researchers have found that nutrition knowledge is lacking among sports persons. Some have suggested that athletes have misconceptions about dietary intake. For example, Anderson, Young, and Prior (2007) found that athletes may believe that they need vitamin or protein supplementation in order to have optimal performance, though research has shown no direct link between supplementation and increased performance. Jacobson and Aldana (1992) found that many of the athletes participating in their study did not know that fats are a form of energy for the body.

Good dietary habits are essential in order to maintain lean tissue mass, healthy immune and reproductive function, and the best possible athletic performance. Optimal nutrition is essential for athletes. Coaches and Physical Education Teachers could influence dietary habits of athletes since they are important figures in the athletes' lives. This research studies factors that might influence coaches' and Physical Education Teachers' nutritional knowledge, habit and perceived roles and attitudes regarding nutrition for themselves and the athletes they coach. College students are typically shown to possess unhealthy dietary behaviors such as skipping meals, snacking frequently on energy-dense food, and taking part in unhealthy weight loss plans. College students also tend to have diets that are high in fat, saturated fat, cholesterol, and sodium, and are low in fiber, vitamins, and minerals.

Planning for proper nutrition contributes to sustaining healthy living habits, motivation, and higher levels of productivity in the life of students.

College students are at an impressionable age in which lifestyle attitudes and behaviours are created and characterize a pattern for later years in life. For this reason, it is important to observe the trends in health behaviour with this age group. Contributing factors to the less than satisfactory nutrition habits among college students include busy schedules and the college environment. For athletes, busy class and practice schedules may influence nutritional choices. Environmental factors include buffet style cafeterias and dormitory living. Having a buffet may increase the amount of food, a student will eat and with the variety of choices available may deter them from choosing healthy whole grains, fruits, and vegetables. Attitudes are another major driver of dietary intake and tend to originate from two major sources, the media and the athlete's coach. The media displays a constant rush of information making the athletes pick and choose what to believe about food choices (Boyle & Anderson, 2004). Coaches, directly working with the athletes, often provide tips on what should be consumed before and after competition.

Significance of the Study

The purpose of this study was to better understand Kerala coaches' and physical education teachers' nutritional knowledge. In order to understand the physical education teachers practices, the study sought to examine the factors that might influence school physical education teachers dissemination of nutritional advice to their athletes: physical education teachers nutritional knowledge towards diet and nutrition for themselves and the athletes they coach as well as the physical education teachers perceived roles and practices in guiding their athletes in their nutritional choices.

Hypothesis

It was hypothesized that there would be no significant difference in nutritional knowledge among physical education teachers and coaches in Kerala

Objective of the study

The major objective of this study was to determine the level of nutrition knowledge of Kerala school coaches and physical education teachers; their nutrition related knowledge is related to make healthier food habit.

Methods and Materials

A non-experimental, quantitative study was used to answer the research questions set forth by the researcher. Data were collected using a four part written, selfadministered questionnaire.

Selection of Subject

The subjects selected for the study will be students and teachers in Kerala. The study focused on 140 physical education

Results of Study

Table 1

Descriptive statistics on Nutritional Knowledge of Physical Education Teachers & Coaches

	Group	N	Mean	Std. Deviation	Std. Error Mean
Nutritional Knowledge	P.E Teachers	140	12.850	.9207	.07782
	Coaches	140	11.700	.9573	.08091

teachers and 140 coaches working under different schools and sports hostel in Kerala.

Tools to be used for collection of data

20-question true/false questionnaire adapted from Corley et al. (1990). Changes were made to the original instrument to add five knowledge questions which were written specifically for this study, based on a review of literature of food myths that are believed by coaches and physical education teachers (Burke, 1987; Clark, 1997 Collision et al., 1996).

Data Collection

Data were collected using a written selfadministered questionnaire. The participants were informed that their involvement in the study was voluntary. It was also explained that participation in the study was contingent upon them reading over the informed consent carefully and affixing their signature, which allowed the researcher to use the data collected only for this study.

Statistical Technique

The data collected will be analyzed using descriptive statistics by frequency distributions, percentage, means, and Standard Deviation, t- ratio and F-ratio, were conducted to determine the significant difference existed in the level of nutrition knowledge among them. The values of the mean, standard deviation and standard error of the physical education teachers and coaches are given Table.1. The mean nutritional knowledge of the physical education teachers (M-12.850) is larger than that of the coaches (M-11.700). However, whether this difference is significant or not has to be tested by using the two – sample t-test for unrelated groups.

Table 2

F and t-table for testing the equality of variances and equality of mean of two groups

	Levene'	s Test							
	for Equ	ality			t-test for Equality		ality		
	of Varia	nces			0	f Means			
	F	Sig.	t	df	Sig (2 tailed)	Mean Diff	SE Diff	95%Cor Interva Diffe	nfidence l of the rence
Nutritional								Lower	Upper
knowledge									
Equal variances									
assumed	6.273	.013	10.24	278	.000	1.150	.1122	.9290	1.370
Equal variances									
not assumed			10.24	277.57	.000	1.150	.1122	.9290	1.370

One of the conditions for using the twosample t-ratio for unrelated groups is that the variance of the two groups must be equal. To test the equality of Levene's test is used. In the Table.2 F - Value is 6.273 which are insignificant as the p-value is 0.013 which is less than 0.05.

Table 3

T-table for the data on Nutritional Knowledge along with F- value

Group	Means	S.D	MeanDiff	SE of diff	t-value	p-value	F-value	P-value
P.E Teachers	12.850	.9207						
		.9573	1.150	.1122	10.24	.000	6.273	.013
Coaches	11.700							

It can be seen from the Table.3 that the value of t- statistic is 10.24. This t-value is significant as the p-value is 0.000 which is less than 0.05. Thus, the null hypothesis of equality of population means of two groups is rejected and it may be concluded that the nutritional knowledge of physical education teachers and coaches are different.

In this example only two tail test is used and, therefore, only conclusion which can be drawn is that the nutritional knowledge of both groups are not equal and further conclusion can be drawn about the larger group mean.

Conclusions

The overall nutrition knowledge scores for the physical education teachers are higher than that of coaches in Kerala. This reveals an overall lack of knowledge as seen in previous studies conducted by Zawila, et al. (2003) and Dunn, et al. (2007). Programms need to be put in place that emphasizes the benefits dietary intake can have on athletic performance. The research reveals that athletes, who believe their performance will increase with optimal nutrition, are more likely to embrace nutrition education.

The study shows that nutrition interventions are needed for physical education teachers and coaches in Kerala. As seen in other research, many countries may be in need of nutrition education programs. Handouts can be a useful tool to provide tips on dietary choices for athletes. Providing the coaches with nutrition education tools can increase their level of confidence in presenting information to their teams.

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ATTITUDE TOWARDS ENVIRONMENT BASED ON GENDER, LOCALE AND MEDIUM OF INSTRUCTION AMONG SECONDARY SCHOOL STUDENTS IN AN ECOLOGICALLY SENSITIVE DISTRICT OF KERALA STATE

Geetha Gopinath*

Abstract

The researcher studies the environmental attitudinal levels of Secondary School students in Pathanamthitta District, Kerala based on gender, locale and medium of instruction. Random sampling was used to select 158 secondary school students from Pathanamthitta District, Kerala. Normative survey method and Environmental Attitude Scale constructed and validated by the investigator was used. Means and standard deviations and test of significance were calculated. Total scores of environmental attitude stood between a low and low average level (> 35,<50). Girls'/boys' and rural/urban students' environmental attitude scores were not significantly different. Tests based on medium of instruction, Malayalam medium students' attitude scores were greater than English medium student's attitude scores. Environmental education, a process for increasing environmental knowledge and awareness is essential for the future of this world. This study evaluates attitude towards the environment among students in Pathanamthitta District, Kerala to take a step forward to remedy lacunae in existing situation.

Key Words: Environmental awareness, Students, Gender, Locale, Medium of instructions

Introduction

'All depends on the purpose; not even a blade of grass shall be cut without a worthy purpose.' ~KulârGava Tantra.

Ancient wisdom though it may seem, the words from the tantra bring out the whole truth about what should be our attitude regarding the environment which sustains life. Human activity is resulting in deliberate destruction of nature at a level that is unprecedented in human history. We are trying to find newer and easier means for satisfying our greed. The most easily identifiable expression of this greed is in the oil explorations that are going on both in sea and on land, and the devastation it is creating,

* Associate Professor, Marthoma Teachers Training College, Edakulam, Ranni, Pathanamthitta District, Kerala, India. Email: drgeethagopinath@gmail.com, Mob: 9446190644

not to say the destruction of fauna and flora due to oil spills. Other issues like mining for rocks and minerals are bringing down mountains and de-silting rivers at unprecedented levels. Expansion of human settlements resulting in destruction of the flora and fauna that are key to biological cycles, are all commonplace. Booming human populations, expanding livestock herds and a potent mix of poverty and human greed are all in one way or another bringing down the curtain on 'life.' At a global level issues like global warming, greenhouse effects, have resulted in melting of ice in the Antarctic regions causing rise in the sea levels. Scientific research reported in the National Geographic indicates sea levels worldwide have been rising at a rate of 0.14 inches (3.5 millimeters) per year since the early 1990s. The trend, linked to global warming, puts thousands of coastal cities, like Venice, Italy and even whole islands at risk of being claimed by the ocean (National Geographic, 2014). All of these indicate that the delicate balance which keeps nature and its elements in check are being disturbed, leading to catastrophic consequences. Awareness regarding the need to protect and sustain nature has to become ingrained in human ethos. It has to develop as an attitude through which all activities are evaluated. Failure to do so will result in an ecological disaster unprecedented in known human history

Any human activity is dependent on attitudes we have as also our actions on those activities. Attitudes can be thought of as relatively stable mental positions held toward ideas, objects, or people (Gleitman, 1991). Attitudes are formed over a period of time based on the influence of the

environment in which we develop. The formation and change of attitude is an internal individual process but is linked to the social world of other people, activities, and issues who are actively engaged in helping form or change our attitudes (Zimbardo, 1985). This process is also a learning process formed directly through questioning, personal experience or operant conditioning. (Fosssy, 1993). Bandura's (1977) social learning theory highlights the process of acquisition of knowledge and attitudes from important others such as parents, teachers, peers, and media figures. Behavior is formed from attitudes and the theory of reasoned action proposed by Fisbein and Ajzen (1975) states that attitudes and cultural norms combine to determine behavioral intentions.

It is thus important for us to understand that an indifferent and irresponsible attitude to the environment can be attributed as the primary cause of this global catastrophe that we are facing today. From the above paragraph it can be seen that the development of an attitude that gives primacy to the need to protect the environment has to start academically at the school level through an educational process. The school has a vey important and critical role to play in this regard. Studies have shown that pressure from children can even influence the parents to respect nature.

Education in its general sense is a form of learning in which the knowledge, skills and habits of a group of people are transferred from one generation to the next through teaching, training, or research. Education frequently takes place under the guidance of others, but may also be autodidactic (Dewey,1916). The world conservation

strategy (IUCN, 1980) has stated that environmental education offers long-term solutions to environmental problems. They have emphasized that a new ethic must be developed so that humanity lives in harmony with the natural world. Also, formal education provides an obvious route through which this can be achieved. Though the impact of environmental education will not be immediate as students will be involved in planning and decision making only as they grow up, yet efforts have been made to promote environmental education at primary, secondary and tertiary levels. In addition, children harbor misconceptions about major environmental issues such as role of rainforests in the global ecosystem and greenhouse effect. This makes it imperative for us to evaluate the knowledge and attitude of students regarding the environment. Several schools in Britain have produced environmental plans, encouraging actions which recycle wastes and protect wildlife, in response to pres-sure from the pupils, rather than those from parents or teachers, Evans, Gill, & Marchant (1996). A proper attitude towards nature has to begin very early.

Therefore, the school and educational system where formal educational inputs are received by the student, have a major and critical role to play in forming the proper attitude regarding the environment in the next generation. This study is merely a small step in that direction, taken as a first step to determine the attitude of students (gender based) in schools studying under diverse conditions (urban/rural, english/malayalam medium) to determine their attitude towards the environment.

Need for the study

It is essential that for attitudinal change to occur and the educational system to be geared for this change a proper educational approach has to be initiated in schools. Studies in this direction are few especially relating the inner regions of Kerala. to Pathanamthitta district is an ecologically important district with a huge forest area that is being invaded by human encroachment. Considering the aspects: 1. The need for formal education to promote environmental education, 2. The need to correct misconceptions regarding the ecosystem among children, 3. The possibility of children becoming proactive promoters of environmental concerns and attitudinal change, 4. Pathanamthitta district being an ecologically sensitive area; this study tries to evaluate the attitude of secondary school students in this district.

Objectives of the study

- 1. To study the attitude of Secondary School students towards the environment.
- 2. To study the attitude of male and female Secondary students towards the environment
- 3. To study the attitude of rural and urban Secondary School students towards the environment
- 4. To study the attitude of students studying in English and Malayalam Medium schools towards the environment.

Hypotheses of the Study

1. There is no significant difference in the attitude among the male and female Secondary School students towards the environment

- 2. There is no significant difference in the attitude among the rural and urban Secondary Schools towards the environment
- 3. There is no significant difference in the attitude among English and Malayalam medium Secondary School Students towards the environment.

Method

In order to realize the above said objectives, normative survey method was employed. Normative survey method of study describes and interprets what exists at present. They are concerned with existing conditions or relations, prevailing practices, beliefs and attitudes etc. Such investigations are termed in research of literature as descriptive survey or normative survey.

Tools used

Environmental Attitude Scale (Suresh & Gopinath, 2009) was constructed and validated by the investigator. The Questionnaire contains twenty items. The scale consisted of twenty statements with five responses - strongly agree, agree, undecided, disagree, and strongly disagree. The Questionnaire has construct validity. The scoring procedure was done in such a way that a weightage of 5,4,3,2,1 was given for every positive statement and a weightage of 1,2,3,4,5, was given for every negative statement. A student could get a maximum of 100 and a minimum of 20 on this scale. Based on these three levels were identified as high, average and low levels of awareness. A high awareness score would be the scoring of a 4 or a 5 on the question i.e., total score of 80-100 and a low awareness would be the scoring of a 1 or a 2 on the question i.e., a score of 20-40, average awareness would be the score of 41-79.

Sample of the study

Random sampling technique has been used in the selection of the sample which consisted of 158 secondary school students from schools in Pathanamthitta District, Kerala, India.

Statistical Techniques Used

1. The Environmental Attitude scores of the various sub-samples were collected and their means and standard deviations were calculated (vide: Table-1). 2. The 't' test was used to test the hypotheses, details of the calculations are given in Tables 2 to 4.

Results

Comparison of the attitude scores of students towards environment

The mean scores, standard deviations, of the attitude towards environment scores of entire sample is given below.

Table 1

Mean and standard deviation of attitude scores of students towards environment

Test	Ν	Mean	S.D.
Whole	158	35.76	12.12

The table above shows the mean and standard deviation of secondary school students in their attitude towards environment. The obtained mean score is 35.76 and standard deviation is 12.12. The mean score for 158 students is 35.76 with standard deviation of 12.12, which is lies between the low and low average scores, when considering the overall maximum score of 100 for the highest attitude level towards the environment.

Hypothesis 1

Comparison of the attitude scores of boys and girls Secondary School students towards environment

The mean scores, standard deviations and 't'-values of the attitude of boys and girls towards the environment is given below.

Table 2

Data and result of test of significant difference between boys and girls Secondary School students, attitude towards environment

Test	N	Mean	S.D.	't' Value	Level of
					Significance
					(0.05)
Boys	89	45.53	8.25	1.70	Not
Girls	69	43.24	8.51		significant

The table above shows that the obtained 't' value 1.70 is less than the table value 1.96 at 0.05 level of significance. This means that there exists no significant difference between boys and girls attitude towards environment. It is inferred that boys and girls students have same level of attitude towards the environment.

Hypothesis 2

Comparison of the attitude scores of rural and urban Secondary School students towards the environment

The mean scores, standard deviations, and 't'-values of the attitude scores of rural and urban students towards the environment are given below.

Table 3

Data and result of test of significant difference between rural and urban Secondary School students attitude towards environment

Test	Ν	Mean	S.D.	't' Value	Level of
					Significance
					(0.05)
Rural	86	45.36	8.33	1 / 2	Not
Urban	72	43.45	8.49	1.42	significant

The above table shows that the obtained t value of 1.42 is less than the table value 1.96 at 0.05 level of significance. This means that there exists no significant difference between rural and urban students attitude towards environment. So it is inferred that the rural and urban students have same level of attitude towards the environment.

Hypothesis 3

Comparison of the attitude scores of Malayalam and English medium Secondary School students towards environment

The mean scores, standard deviations, and 't'-values of the attitude scores of Malayalam and English medium students towards the environment are given below.

Table 4

Data and result of test of significant difference between Malayalam and English medium Secondary School students' attitude towards environment

Sub samples	N	Mean	S.D.	't' Value	Level of Significance (0.05)
Malayalam English	63 98	42.36 24.86	8.51 6.41	13.97	Significant

Above table shows that the obtained t value 13.97 is greater than the table value 1.96 at 0.05 level of significance. This means that there exists a significant difference between Malayalam and English medium students attitude towards environment. The mean score of Malayalam medium (42.36) is greater than the mean score of English medium (24.86) So it is inferred that the Malayalam medium school students have higher attitude towards environment than the English medium students.

Discussion

This study indicates that the mean score secondary school students of in Pathanamthitta in relation to their attitudes to the environment is in the low to the low average range. This compares poorly with the scores of 5th grade students in a Taiwan and Canada where the students held positive behavior and attitudes towards the environment, Huang and Yore (2004). In another study among Lebanese high school students it was found that they had a positive attitude towards the environment, Makki, Abd-El-Khalick, and Boujaoude's (2003). A study from Karachi, Pakistan showed that secondary school students are moderately engaged with environmental issues (Yousuf & Bhutta, 2012). It is possible that the environmental awareness of students in Pathanamthitta District is poor and this is also reflected in the attitudes.

As regards the three hypotheses the 't' test did not indicate any significant difference between the attitudes of boy/girl or rural/ urban secondary school students. The scores were all in the lower average levels. Various studies have shown diverse levels of attitudinal scores in relation to boy/girl and rural/urban secondary school students, some significant and others not significant.

Shivakumar (2011), conducted study in Davangere district of Karnataka with a sample of 1440 students and found that: 1) Environmental attitude among boys and girls is not significantly different. 2) Environmental attitude is significantly and positively related to locality of the schools. Lower environmental attitude of the students in rural areas is due to lack of better exposure to information via all kinds of media. 3) The students belonging to urban background are comparatively better in terms of their environmental attitude as compared to the students belonging to rural back ground. This difference is due to the difference in the educational level of the parents of urban and rural students.

In a study by Yousuf & Bhutta, (2012) conducted in Karachi. Pakistan the researchers found that there was no significance difference between male and female students' attitude towards environmental issues. Mrema (2008) from Halifax, Canada found that girls seem to present greater pro-environmental attitudes than boys in both grades and students in the lower grade level present greater proenvironmental attitudes than those in the higher level. A study conducted in Bangladesh by Sarkar (2011) found that overall students from both the urban and rural areas expressed favourable environmental attitudes with girls having a significantly higher level of favourable environmental attitudes than boys; in particular, rural girls had the highest level of environmental attitudes comparing among others. Similarly, a study from Hyderabad

(Mir, 2013) found that the environmental attitude of girls was higher than that of boys and that of urban students was greater than rural students.

The differences in scores in various conditions may be due to the differences in the study methodology. It is also possible that local cultural and societal influences may play a role in determining the attitudes of the students.

As regards the third hypotheses relating to the difference between Malayalam and English medium students attitude towards environment the finding is that Malayalam medium school students have a higher attitude towards the environment than the English medium students. Unfortunately, comparative evaluation cannot be made in this regard due to the lack of published material based on medium of instruction in Kerala.

Conclusion

Attitudes are formed early in life and the educational system has a major role to play in the formation of attitudes. Attitudes to the environment are also in this category. Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1978). It is this educational process which will ensure continued environmental protection and sustenance. The younger generation would bear the costs or benefits of the environmental decisions

that we take today. Kerala is an environmentally sensitive and critical area, especially as the Western Ghats that provide forest coverage to a variety of fauna and flora exist here. A lot of controversy has been created in the recent past on the implementation of the Gadgil Committee report and the Kasturirangan report. The confusion and fear that has been generated in the minds of the public due to various stances need to be allayed. Our natural resources have to be protected for future generations to experience life in tune with nature. This calls for an attitudinal change and as in the words of the KulârGava Tantra. all our environmental actions need to have a proper life sustaining purpose.

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St. Thomas College of Teacher Education, Pala, Kerala, India Website: www.stce-pala.info, www.stctepala.org email: educationalextracts@gmail.com

EFFECTIVENESS OF INQUIRY TRAINING MODEL IN PHYSICS AMONG HIGHER SECONDARY SCHOOL STUDENTS

Sreeja S Kaimal* Dr. Celene Joseph**

Abstract

This paper examines the effectiveness of Inquiry Training Model in achievement in Physics among Higher Secondary School Students by using experimental method. The sample consists of 60 students from Govt. Higher Secondary School Pala of which 30 students belong to the experimental group and the rest 30 belong to the control group. Achievement test in Physics, Lesson Transcripts based on Inquiry Training Model and Lesson Transcripts based conventional method were the used for the collection of data. The collected data were analyzed by using statistical procedures such Mean, Standard Deviation and two tailed test of significance of difference between means for large independent groups. The major findings of the study are 1)The effect of Inquiry Training Model is significantly higher than that of existing method in achievement in physics.2)The effect of Inquiry Training Model on achievement in physics in terms of its components – knowledge, understanding, application are significantly higher than that of existing method. The study revealed that Inquiry Training Model is effective to develop achievement in Physics among Higher Secondary School Students when compared with Existing method of Instruction.

Key Words: Inquiry Training Model, Achievement in physics, Models of Teaching, Knowledge, Understanding, application.

Introduction

Looking at our present era one feels a new approach is emerged as a panacea to the sole process of learning. Our world has now become an information rich and technology based society. Today it is becoming essential to give emphasis more on how to learn than on what to learn. Hence the need of the hour is rejuvenation of our educational aims from the point of view of a better society which not only consumes but also produces creativity. Inquiry Training Model helps to teach students through the process of investigating and explaining unusual phenomena. It considers students as

* Research Scholar, Bharathiyar University, Coimbatore. E-mail: sreejaskaimal@yahoo.com

^{**} Associate Professor, St. Thomas College of Teacher Education, Pala. E-mail: pavithracelene@yahoo.com

scholars who have to organize knowledge and general principles based on a conception of scientific method; it attempts to teach students some of the skills and language of scholarly inquiry. Teaching of science developed in students an attitude of eager, alert observation and a constant questioning of old procedure in the light of new observation. Inquiry Training Model prepares today's students for the information age of the 21st century where collaboration is a necessary skill. Inquiry Training Model can be successfully incorporated to the teaching of science subject.

Models of Teaching

In the point of view of teaching, models of teaching is a plan or pattern that can be used to shape curricula, to design instructional materials and to guide instructions in the classroom and other settings. The most important aim of any model of teaching is to improve the instructional effectiveness in an interactive atmosphere and to improve or shape the curriculum. A model of teaching consists of guidelines for designing educational activities and environment. They are meant for creating suitable learning environments. They provide specifications for constructing learning situations. Each model represents a view on what is important to learn and how it should be learnt. "A model of teaching is a description of learning environment. The description has many uses ranging from planning curriculum, courses, units and lessons to design instructional materials- books and workbooks, multimedia programmes and computer assisted learning programmes. Eggen defines models of teaching as prescriptive teaching strategies. Models of teaching differ from general approaches of teaching in that they are designed to realize specific instructional objectives. General approaches of teaching are considered to be applicable to all teaching situations where as Models of teaching and learning are not applicable to all teaching learning situations. They are rather prescriptive teaching strategies to realize specific instructional goals. One model is not useful to realize all the objectives. Therefore different models or teaching learning strategies are required to realize different objectives.

Models of teaching present the steps necessary to bring about desired outcomes. A model of teaching can be used to design face-to face teaching in classrooms or tutorial settings to shape instructional materials including books, films, tapes, and computer mediated programmes and curricula and long term courses of study. Apart from the above uses it creates the necessary environment which facilitates the teaching learning process. The core of the teaching process is the arrangement of the environment with in which the student can interact. It specifies the ways of teaching and learning intend to achieve specific goals. It is a step by step procedure that leads to specific learning outcomes. Models are prescriptive teaching strategies designed to accomplish particular instructional goals. It is not a substitute to any teaching skill. Rather it creates a conducive teachinglearning environment in which teachers teach more effectively by making the act of teaching more systematic and efficient (Joyce, B. & Weil, M.1992).

Models of teaching are really models of learning. During instruction we help students

to acquire information, ideas, skills, values, and ways of thinking and means of expressing themselves. We are also teaching them how to learn. "In fact the most important outcome of teaching learning may be the students' increased capabilities to learn more easily and effectively in the future, both because of knowledge and skill they have acquired and because they have mastered learning process.

Inquiry Training Model

The children's world is full of questions to ask in contrast to adults which know the answers. Schools tend to encourage the movement from questions to answers since success in educational testing becomes putting the right answer in the blank space or making the correct response. Questions in school tend to have one right answer and questions for which there are no answers are rare.

It has been stated that true wisdom might best be defined as knowing how little one knows in contrast to how much one knows. Therefore knowing how to learn is more important that knowing all the answers. Teaching students to question and ask quality questions is more important than the correctness of the answers they can give.

Teaching science through inquiry requires that students ask questions and figure things out for themselves. It involves the attempt to answer to the questions and seek information. Inquiry can be conducted in a variety of ways: observing nature, predicting outcomes, manipulating variables, analyzing situations, and verifying assertions. It may involve discussing topics with others, reading, conducting field studies, surveys, and laboratory investigations, or all of these as one attempt to discover new knowledge and to figure things out.

The inquiry model, developed by Richard Suchman, is based on the premise that the intellectual strategies used by scientists to solve problems and inquire into the unknown can be taught to students. Using the natural curiosity of students, they can be trained and disciplined in the procedures of inquiry. The model was developed from analyzing the methods used by creative research personnel. The elements of their inquiry process were identified and these were built into an instructional model called inquiry training (Joyce, B. & Weil, M.1992).

Inquiry training is designed to bring students directly into the scientific process through exercises that compress the scientific process into small periods of time. The training has resulted in an increased understanding of science, more creative thinking, and skills for obtaining and analyzing information as students establish facts, build concepts, and then generate and test explanations or theories. The students are active learners involved in exploration, questioning, problem solving, inductive reasoning, invention, labeling, and discovery.

The inquiry process will help students:

- i. To approach future problems with confidence in their abilities to seek out the solution
- ii. To begin to consider success and failure as information rather than reward or punishment
- iii. Practice the process to develop the ability to sense the relevance of variables, make intuitive leaps, and put problems into forms with which they know how to work

iv. Improve their memory process because when they integrate material into their own cognitive structure, thus material is made more readily retrievable.

The inquiry training method requires active participation in scientific inquiry and capitalizes on the student's natural curiosity. The general goals of inquiry training are:

- i. To develop the intellectual discipline and skills necessary to raise questions and search out answers stemming from their natural curiosity.
- ii. To acquire and process data logically
- iii. To develop intellectual strategies that they can use to find out why things are as they are.

The Inquiry Training Model is based on Suchman's theory that:

- 1. Students inquire naturally when they are in puzzle
- 2. They can become conscious of and learn to analyze their thinking strategies
- 3. New strategies can be taught directly and added to the students existing ones
- 4. Cooperative inquiry enriches thinking and helps students to learn about the tentative, emergent nature of knowledge and to appreciate alternative explanations.

This model differs from other inquiry models in the way that the data are presented. Students gather data in a simulated process through questioning rather than actual manipulation of data. Thus, the method is more process oriented as the primary goal is to improve students' ability to relate data to the inferences they have formed. Inquiry training has five phases. The first phase is the student's confrontation with the puzzling situation. Phases two and three are the data-gathering operations of verification and experimentation. In the data-gathering phases, the students ask a series of question that the teacher answers with a 'yes' or 'no', and they conduct a series of experiments of the problem situation. In the fourth phase, the students organize the information obtained during the data-gathering phase and try to explain the discrepancy. In the last phase, students analyze the problem-solving strategies they used during the inquiry(Joyce, B.&Weil, M.1992).

The teacher's role is to construct the problem situation, to referee the inquiry procedures, to respond to students inquiry probes with the necessary information, to help students establish a focus in their inquiry, and to facilitate discussion of the problem situation among the students.

Need and Significance of the Study

Physics teachers use mainly lecture method at Higher Secondary Level. It makes learning very abstract and devoid of inculcating scientific inquiry. Teachers pour a lot of textual knowledge leaving no scope of scientific inquiry. In the absence of proper teaching and evaluation system, students tend to memorize rather than understand their lessons. As a result, the interesting and fundamental science subjects like Physics which requires logical thinking becomes tough and dreadful. This investigation is intended to study the effectiveness of inquiry training model in teaching physics among Higher Secondary School Students. The teaching of Physics is far from ideal way.
Hence it is one of the most disliked subjects for average students. Literature on methods of teaching gives a number of methods suitable for science teaching. But we cannot follow a method of teaching blindly. It is necessary to conduct a study with students as subjects to find out the effectiveness of a particular method for a particular topic.

Objectives of the Study

The objectives of the study are:

- 1. To prepare an instructional material based on Inquiry Training Model for Teaching Physics at standard XI.
- 2. To compare the effect of Inquiry Training Model with existing method of teaching on Achievement in Physics among the students of standard XI in the Higher Secondary Schools of Kottayam District.
- 3. To compare the effect of Inquiry Training Model with existing method of teaching in terms of the components of Achievement in Physics
 - a. Knowledge.
 - b. Understanding
 - c. Application

among the students of standard XI in the Higher Secondary Schools of Kottayam District

Hypotheses of the Study

- 1. There is significant difference between the means of scores on posttest on Achievement in Physics among the students of the experimental group and the control group.
- 2. There is significant difference between the means of scores on posttest on Achievement in Physics in terms of components

- a. Knowledge.
- b. Understanding
- c. Application

among the students of the experimental group and the control group.

Methodology

The investigator adopted Pretest Posttest equivalent groups design for the present study. The sample for the study was selected by using purposive sampling method. Sample include 62 students who were studying in standard XI. The investigators assign them into two groups by equating them manually on the basis of their scores in a previous achievement test in physics and randomly select one group as experimental and the other as the control group. Then the investigators ensured the equivalence of the groups on the basis of the scores on previous achievement test in physics by using two tailed test of significance of difference between means. Then the investigators administered the treatment to the experimental group by using Inquiry Training Model and teach the control group by using existing method and after the experiment, administered the posttest to both the groups. For analyzing the data the investigators used the descriptivestatistics Mean and standard deviation for describing the data and the inferential statistics two tailed test of significance of difference between means for large independent sample for testing the effectiveness of Inquiry training Model.

Analysis and Findings

a) Analysis of the Data With Respect to Achievement in Physics

The second objective of the study was to compare the effect of Inquiry Training

Model of teaching in physics with existing method of teaching on achievement in physics among Higher Secondary School students of Kottayam District. For testing this hypothesis the following null hypothesis was formulated. H_{01} : there is no significant difference between the means of scores on the achievement in Physics among the students in the experimental group and control groups.

Table 1

Number, Means, Standard Deviations and t-value of The Scores on Achievement in Physics of the Experimental Group and the Control Group

Group	No. of students	Mean	Mean Difference	SD	t-value	Df	p-value
Experimental	31	38.71	2.23	7.17	11 28	60	000
Control	31	21.35		4.68	11.20	00	.000

From the table1, it is observed that the means of scores of achievement in physics obtained for experimental group is 38.709 and for control group is 21.354. The standard deviation of the scores in achievement in physics for experimental group is 7.17 and for the control group is 4.68. Since the pvalue is less than .05 the t value11.28 is significant at .05 level of significance. Therefore the null hypothesis, which states that 'there is no significant difference between the means of scores on the achievement in Physics among the students in the experimental group and control group was not accepted. In the light of the above result it can be concluded that there is significant difference between the means of scores on the Achievement test in Physics among the experimental group and the control group.

Effect of Inquiry Training Model on the Components of Achievement in Physics

The third objective of the study wasto compare the effect of Inquiry Training Model with existing method of teaching in terms of the components of Achievement in Physics-Knowledge, Understanding and Applicationamong the students of standard XI in the Higher Secondary Schools of Kottayam District

Effect of Inquiry Training Model on Knowledge

In order to analyze the third objective with respect to knowledge, the null hypothesis H_{02} was formulated.

 H_{02} : There is no significant difference between the means of scores on posttest on achievement in physics with respect to knowledge among the students in the experimental group and the control group.

Table 2

Number, Means, Standard Deviations and t-value of the Scores on Achievement in Physics with respect to Knowledge

Group	No. of students	Mean	Mean Difference	SD	t-value	Df	p-value
Experimental	31	7.16	2.23	1.00	7.89	60	.000
Control	31	4.94		1.20928			

From the table 2, the investigators observe that the means of scores obtained for the experimental group is 7.161 and the control group is 4.936. The standard deviation obtained for the experimental group is 1.00 and for the control group is 1.209. Since the'p' value is less than .05 the t value $t_{60} = 7.89$, p<.005 is significant at .05 level of significance, the null hypothesis that, there is no significant difference between the means of scores on posttest on Achievement in Physics with respect to knowledge among the experimental and control groups was not accepted. In the light of the above result the investigators conclude that there is significant difference between the means of scores on achievement in Physics with respect to knowledge among the experimental and control groups.

d) Effect of Inquiry Training Model on Understanding

In order to analyze the effect of Inquiry training model on Understanding, the investigators formulated the null hypothesis H_{03} as follows.

 H_{03} : There is no significant difference between the means of scores on posttest on Achievement in Physics with respect to understanding among the students in the experimental group and the control group. Table three presents the details of analysis and results.

Table 3

Number, Means, Standard Deviations and t-value of the Scores on Achievement in Physics with respect to Understanding

Group	No. of students	Mean	Mean Difference	SD	t-value	Df	p-value
Experimental	31	13.35	5 29	3.06	7 88	60	000
Control	31	8.06	5.27	2.14	/.00		.000

From the table 3, the investigators observe that the means of scores obtained for the experimental group is 13.35 and the control group is 8.06. The standard deviations obtained for the experimental group is 3.061 and for the control group is 2.14.Since the 'p' value is less than .05, t_{60} =7.88, p<.005 is significant at .05 level of significance. Therefore the null hypothesis that, there is no significant difference between the means of scores on posttest on Achievement in Physics with respect to understanding among the students in the experimental and control group is not accepted. In the light of the above result it can be concluded that there is significant difference between the means of scores on posttest on Achievement in Physics with respect to understanding among the students in the experimental and control groups.

e) Effect of Inquiry Training Model on Application

In order to analyze the third objective with respect to Application, the investigators formulated null hypothesis H_{04} .

 H_{04} There is no significant difference between the means of scores on posttest on Achievement in Physics with respect to Application among the students in the Experimental Group and Control Group. Table 4 shows the details of the analysis and the results.

Table 4

Number, Means, Standard Deviation and t-value of the Scores on Achievement in Physics with respect to Application

Group	No. of students	Mean	Mean Difference	SD	t-value	Df	p-value
Experimental Control	31 31	18.23 8.29	9.94	4.05 2.77	11.28	60	.000

From the table 4, it is obvious that the mean score obtained for the experimental group is 18.23 and the control group is 8.29. The standard deviation obtained for the experimental group is 4.05 and for the control group is 2.77. Since the'p' value is less than .05, the t_{60} =11.28,p<.005 is significant at .05 level of significance. Therefore the null hypothesis that there is no significant difference between the means of scores on posttest on Achievement in Physics with respect to Application among the students in the experimental and control group was not accepted. In the light of the above results, the investigators conclude that there is significant difference between the means of scores on achievement in Physics with respect to Application among the students in the experimental and control groups.

Major findings of the study

The following are the major findings of the present study.

- 1. The effect of Inquiry Training Model is significantly higher than that of existing method in achievement in Physics among the students of Higher Secondary Schools of Kottayam Districts.
- 2. The effect of Inquiry Training Model on achievement in Physics in terms of Knowledge is significantly higher than that of existing method among the

students of Higher Secondary Schools of Kottayam Districts.

- 3. The effect of Inquiry Training Model on achievement in Physics in terms of Understanding is significantly higher than that of existing method among the students of Higher Secondary Schools of Kottayam Districts.
- 4 The effect of Inquiry Training Model on achievement in Physics in terms of Application is significantly higher than that of existing method among the students of Higher Secondary Schools of Kottayam Districts.

Educational implications of the study

The findings of the study led to the following implications:

- 1. Instructional material based on Inquiry Training Model of teaching can be effectively used to develop attainment of inquiry skills at the primary, secondary and higher secondary school level.
- 2. The instructional material prepared based on Inquiry Training Model teaching can be computerized for using computer assisted instruction and can be used effectively to achieve physics for different classes.
- 3. Training strategy can be developed to train the staff of District institutes of

education and Training (DIET) and in service teachers to orient them to use this model in teaching.

- 4. The teacher should be proficient in providing problematic situation in physics while designing the instructional experiences and, such training help the pupils attain problem solving ability not only in Physics but also to all disciplines and in real life.
- 5. Study has implication on construction of curriculum, syllabus and text book. The text book should provide sufficient problematic situation to enable the students to develop problem solving skills.

Conclusion

The present study reveals that Inquiry training model is effective in improving the achievement of students in Physics. Actually this model is designed to train students in the inquiry skills. The teaching strategies developed in Inquiry training mode will help students to develop inquiry skills in advance to the sound achievement. Hence the use of this method in classroom is advantageous compared to existing method. The introduction of innovative models and strategies to the practicing teachers will revamp the educational process which will results in desirable outcomes.

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DIFFERENTIAL EFFECT OF EDUCATION ON THE EARNINGS OF PEOPLE FROM DIFFERENT COMMUNITIES AND ECONOMIC BACK GROUNDS

Dr. P.P. Shajimon*

Abstract

Economics of Education is one of the developing branches of Economics. A good number of research studies have been carried out to analyse the economic value of education. The present investigation is to assess the contribution of education to the economic status of people in an educationally backward, but educationally advanced district of Idukki. The sample for the study consisted of 2254 earning members selected from the district. Statistical techniques such as test of significance of the difference between mean and analysis of variance were employed for the analysis of data. The tools used for the study are Questionnaire and Economic Welfare Status Scale. The study revealed that education has a significant role to play in determining the Earnings of people, irrespective of Community and Economic Background of the Family. The study also revealed that there exists considerable difference in the Earnings of people with the same level of education.

Key Words: Education, Earnings, Community, Economic Background

Introduction

Education is the supreme form of wealth and is the fulcrum of every kind of development. It is the process of human enrichment for the achievement of higher and better quality of life. It transforms the raw human beings into human resources, other wise known as human capital and prepares them to be capable of utilizing the resources economically. It is a means of social improvement and material well being, especially for the economically and socially backward people. It provides them the capacity of acquiring new skills and develops in them the right attitude to wealth, savings and work.

Need for the study

In India considerable progress has been achieved in terms of literacy, school enrolment, network of schools and spread of higher education institutions including technical and professional education. Expenditure on education, both governmental and parental is on the increase. But this rise in expenditures is justifiable, if it provides

* Assistant Professor, St. Thomas College of Teacher Education Pala, Kottayam Dist. Kerala, E-mail: ppshajimon@yahoo.in, 09446502832 higher productivity in terms of higher earnings and security to households.

Many economists believe that there is a positive relationship between education and earnings of individuals irrespective of the sector of employment. But there exists alternate views among economists and educationists regarding the contribution of education to earnings. This broken relationship demands further investigation. Also the influence of the factors like Community, Economic Background of the family etc, on the Earnings of people also require special attention.

Objectives of the study

- 1. To find out the influence of education on the Earnings of people having different levels of education in the total sample and in the sub samples based on Community and Economic background of the family.
- 2. To find out whether there exists any significant difference between the Earnings of people having the same level of education in the sub samples based on Community, and Economic background of the family.

Methodology of study

The present investigation is aimed to study the role of education in determining the economic status of people. Hence to investigator adopted Normative Survey Method for the study. The independent variable selected for the study is the level of education attained by the people. The dependent variable is the Earnings of people. Earnings denote the average monthly earnings of individual members from all sources. The sample for the present study consisted of 2254 individuals from 1500 households selected by Stratified Random Sampling Technique from Idukki District. For the purpose of the present study the investigator prepared a Questionnaire and Economic Welfare Status (EWS) Scale. The important statistical techniques employed for the analysis of data are: Test of Significance of the difference between Means (t-test) and Analysis of Variance (ANOVA).

Procedure of the study

The sample individuals were divided into Four categories according to their level of education. They are (i) School Educated (EI), (ii)Certificate holders (E2),(iii) Degree/ Diploma holders (E3), (iv) Post Graduates and above (E4) The Mean Earnings of each of these categories were computed for the total sample and for the sub-sample based on Community- Scheduled Castes and Scheduled Tribes (SC/ST), Other Backward Community (OBC), Forward Community (FC); and Economic Background of the Family (Low, Average, High) Difference in the Earnings people having different level of education and having same level education are analysed in detail.

Analysis and interpretation

A comparison of mean Earnings of different Educational categories (E_1 , E_2 , E_3 , E_4) of people is made for the total sample and for the sub samples. Then the difference in the mean Earnings of each Educational Category of people in the sub samples based on, Community and Economic Background of the family were also found out using statistical techniques – Test of Significance of the Difference between Means (t-test) and Analysis of Variance (ANOVA).

the four Educational categories of people in the total sample is presented in table

1. Total Sample

Total sum of squares, mean sum of squares and F ratio for the mean earnings of

Table 1

Summary of Analysis of Variance (ANOVA) of Mean Earnings of Different Educational Categories in the Total Sample

Source	Sum of Squares	df	Mean Square	F
Between Groups	14202468985.88	3	4734156328.62	243.85**
Within Groups	43681330996.36	2250	19413924.88	
Total	57883799982.25	2253		

** Significant at 0.01 level

From the table it is observed that the value of F statistic is 243.85, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of people belonging to different Educational categories in the total sample.

2. Community Groups

A. Earnings of different educational categories

The difference in the mean earnings of the four Educational categories in the

SC/ST, OBC and FC sub-samples are given below.

I. Scheduled caste/scheduled tribe

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the SC/ST sub-sample are given in table.

Table 2

Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Community - SC/ST

Source	Sum of Squares	df	Mean Square	F
Between Groups	4009304494.10	3	1336434831.36	92.57**
Within Groups	7362815544.81	510	14436893.22	
Total	11372120038.91	513		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 92.57, and is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of SC/ ST belonging to different Educational categories.

of different Educational categories of people in the OBC sub-sample were computed. The

data and results are given in table.

II. Other backward community (obc)

Total sum of squares, mean sum of squares and F value for the mean earnings Table 3

Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Community – OBC

Source	Sum of Squares	df	Mean Square	F
Between Groups	4030354845.341	3	1343451615.114	80.20**
Within Groups	13937803910.639	832	16752168.162	
Total	17968158755.981	835		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 80.196, which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of OBC belonging to different Educational categories.

III. Forward community (fc)

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the FC sub-sample are given in the table.

Table 4

Summary of Analysis of Variance (ANOVA) of Mean Earnings of Educational Categories Based on Community – FC

Source	Sum of Squares	df	Mean Square	F
Between Groups	6338404304.67	3	2112801434.89	88.94**
Within Groups	21379920783.82	900	23755467.53	
Total	27718325088.49	903		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 88.94, which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of FC belonging to different Educational categories.

B. Earnings of each educational category – community groups

The difference between mean earnings of each Educational Category of people E_1 ,

 E_2 , E_3 , E_4 in the SC/ST, OBC, FC subsamples have been found out using ANOVA and is presented below:

i. Educational Category - E₁

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_1 Educational Category of people in the SC/ST, OBC and FC sub samples were computed. The data and results are given in the table.

Table 5

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_1 Educational Category Based on Community

Source	Sum of Squares	df	Mean Square	F
Between Groups	306775754.27	2	153387877.14	14.35**
Within Groups	11040227450.35	1033	10687538.67	
Total	11347003204.63	1035		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 14.35 which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of various communities belonging to E_1 Educational Category.

ii. Educational Category - E₂

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_2 Educational Category of people in the SC/ST, OBC and FC sub samples are given in table.

Table 6

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_2 Educational Category Based on Community

Source	Sum of Squares	df	Mean Square	F
Between Groups	292076699.71	2	146038349.85	10.50**
Within Groups	6413258386.49	461	13911623.39	
Total	6705335086.20	463		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 10.50, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of various communities belonging to E_2 , Educational Category.

iii. Educational Category - E₃

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_3 Educational Category of people in the SC/ST, OBC and FC sub samples are given in table.

Table 7

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_3 Educational Category Based on Community

Source	Sum of Squares	df	Mean Square	F
Between Groups	3095337554.42	2	1547668777.21	48.54**
Within Groups	16804009615.38	527	31886166.25	
Total	19899347169.81	529		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 48.54, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of various communities belonging to E_3 Educational Category.

iv. Educational Category - E_4

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_4 Educational Category of people in the SC/ST, OBC and FC sub samples are given in the table.

Table 8

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_4 Educational Category Based on Community

Source	Sum of Squares	df	Mean Square	F
Between Groups	372243695.57	2	186121847.78	7.68**
Within Groups	5357401840.13	221	24241637.28	
Total	5729645535.71	223		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 7.68, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of communities belonging to E_4 Educational Category.

3. Economic background of the house holds

A. Earnings of different educational categories

The difference in the Mean Earnings of the four Educational categories of people in

the Low, Average and High economic status households are summarised as follows:

I. Low economics status households

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the Low economics Status Households sub sample were computed. The data and results are given in table.

Table 9

Summary of Analysis of Variance (ANOVA) of Mean Earnings of Different Educational Categories in Low Economic Status Households

Source	Sum of Squares	df	Mean Square	F
Between Groups	84541425.21	3	28180475.07	12.91**
Within Groups	672158670.94	308	2182333.34	
Total	756700096.15	311		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 12.91 which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of different Educational categories of people in the Low economic Status households.

II. Average economic status households

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the Average economic Status households were computed. The data and results are given in table.

Table 10

Summary of Analysis of Variance (ANOVA) of Mean Earnings of Different Educational Categories in Average Economic Status Households

Source	Sum of Squares	df	Mean Square	F
Between Groups	4074508212.27	3	1358169404.09	105.92**
Within Groups	19464842037.39	1518	12822689.08	
Total	23539350249.67	1521		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 105.92 which is highly significant (0.01 level). It can be concluded that there is significant difference in the earnings of different Educational categories of people in the Average Economic Status households.

III. High economic status households

Total sum of squares, mean sum of squares and F value for the mean earnings of different Educational categories of people in the High Economic Status households sub sample were computed. The data and results are given in table.

Table 11

Summary of Analysis of Variance (ANOVA) of Mean Earnings of Different Educational Categories of People in High Economic Status Households

Source	Sum of Squares	df	Mean Square	F
Between Groups	1155519047.61	3	385173015.87	9.79**
Within Groups	16362814285.71	416	39333688.18	
Total	17518333333.33	419		

** Significant at 0.01 level

From table it is obvious that the value of the F statistic is 9.79, which is highly significant (0.01 level). It can be concluded that there is significant difference in the

earnings of different Educational categories of people belonging to High EWS households.

Total sum of squares, mean sum of

squares and F ratio for the mean earnings of E_1 of people in the Low - Average - High

EWS households were computed. The data

and the results are presented in table.

i. Educational Category - E₁

B. Earnings of each educational category –economic background groups of households

The difference between the mean earnings of each Educational Category of people in the Low - Average - High EWS group of households were found out using ANOVA and is presented below:

Table 12

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_1 Educational Category of People Based on EWS of Households

Source	Sum of Squares	df	Mean Square	F
Between Groups	1940219484.09	2	970109742.04	106.53**
Within Groups	9406783720.54	1033	9106276.59	
Total	11347003204.63	1035		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 106.53, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of people in E_1 Educational Category in the various EWS groups of households.

ii. EDUCATIONAL CATEGORY - E,

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_2 Educational Category of people in the Low, Average and High EWS households were computed. The data and results are given in table.

Table 13

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_2 Educational Category of People in EWS of Households

Source	Sum of Squares	df	Mean Square	F
Between Groups	811632197.31	2	405816098.65	31.74**
Within Groups	5893702888.88	461	12784604.96	
Total	6705335086.20	463		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 31.74, which is highly significant (0.01 level). The result thus indicates that there is significant difference

in the earnings of people in the E_2 Educational Category belonging to various EWS groups of households.

Low, Average and High EWS household were computed. The data and results are

iii. Educational Category - E₃

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_3 Educational Category of people in the

Table 14

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_3 Educational Category Based on Economic Status Households

given in the table.

Source	Sum of Squares	df	Mean Square	F
Between Groups	3095337554.42	2	1547668777.21	48.54**
Within Groups	16804009615.38	527	31886166.25	
Total	19899347169.81	529		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 48.54, which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of people in the E_3 Educational Category in the various EWS groups of households.

iv. EDUCATIONAL CATEGORY - E₄

Total sum of squares, mean sum of squares and F ratios for the mean earnings of E_4 Educational Category of people in the E_4 Educational Category in the Low, Average and High EWS households were computed. The data and results are given in table.

Table 15

Summary of Analysis of Variance (ANOVA) of Mean Earnings of E_4 Educational Category Based on Economic Status Households

Source	Sum of Squares	df	Mean Square	F
Between Groups	1334326766.484	2	667163383.242	33.55**
Within Groups	4395318769.231	221	19888320.223	
Total	5729645535.714	223		

** Significant at 0.01 level

From table it is observed that the value of F statistic is 33.55 which is highly significant (0.01 level). The result thus indicates that there is significant difference in the earnings of people in the E_4 Educational Category in the various EWS groups of households.

Conclusion

- 1. Education is an important factor that determines the earnings of people irrespective of Community and Economic Background of Family.
- 2. The earnings of more educated people will be higher than the earnings of less educated.

- 3. Education affects the earnings of people differently.
- 4. Factors such as Community and Economic Background of Family influences the earnings of educated people.

Educational Implications

- 1. As education is an important factor determining the earnings measures may be taken for the educational development of people.
- 2. From the school stage itself, students should be familiar with vocational aspects of education so that it would be helped to earn them a living.
- 3. Educational practices should be purposeful, creative and productive. Occupational information, guidance and counselling, socially useful productive work or fieldwork could be arranged for the vocational development of students.
- 4. Studies may be motivated to find out the reasons and remedies for the differences in the earnings of people having the same level of education.
- 5. Governments and other authorities should give financial assistance to educated persons from backward communities and poor economic backgrounds to ensure higher earnings.

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St. Thomas College of Teacher Education, Pala, Kerala, India Website: www.stce-pala.info, www.stctepala.org email: educationalextracts@gmail.com

YOGA AND WELLNESS

Dr. Sosamma John* Jijo K Joseph**

Abstract

As a part of the religious culture exercise and Yoga were an integral part of our daily life during the pre- historic time. People were enjoying the physical activity while performing the profession. The majority of them were farmers; hence they had to work hard to earn their livelihood. Life depended on rigorous physical activities both in occupation and recreation. Due to the involvement of the western culture and education resulted in to white collar jobs and more pleasure seeking activities. It tremendously reduced the exposure to physical activities. Hypo Kinetic diseases like Heart diseases, Diabetics, High Blood Pressure and Obesity are the result of modern culture Yoga and yogic culture find solution for the life skill diseases. Hence yoga becomes a passion among the people.

Key Words: *Yoga, Wellbeing, Life style, Blood Pressure, Obesity, Asanas, Meditation, Yoga therapy, etc.*

Introduction

Lifestyle, wellbeing and Yoga

"Exercise may not necessarily add years to your life but will add life to your years". Indeed, it is true. Physical fitness is based upon a solid foundation of the good health. Staying fit is a combination of exercise for the body and reunion of the mind. It involves developing the ability to multitask and stay focused for long hours. While fitness was a onetime morning regimen earlier, it is an ongoing process now. It pervades far more aspects of life now than it ever has. A quick warm up consists of skipping, spot jogging, jumping jacks or any workout with a similar cardiovascular output for 2-3 minutes. A warm up is supposed to get your blood pumping, increased blood flow in the muscles helps to improve muscle performance. Stretching is not a warm up, but a very integral part of a warm up. Start with joints in slow circular clockwise and anticlockwise movements until the joints function smoothly. This facilitates the joints function smoothly, by lubricating the entire joints. A warm up not only helps your muscles perform better. Go for a ten minute brisk walk, focus

^{*} Assistant Professor, Department of Physical Education, Catholicate College, Pathanamthitta, Kerala. E-mail: sosammasp@gmail.com

^{**} Assistant Professor, Department of Physical Education, Catholicate College, Pathanamthitta, Kerala.

on your breathing. After you have worked out the best way to reduce muscle fatigue, soreness, cramps and remove muscle wastes such as lactic acid and to improve flexibility and mobility is to do a cool down stretch. Starting the day well – It is a best medicine walking of any kind benefits the body. Besides, aiding weight loss, walking has been to known to improve the ability to think clearly, treat depression, sleep better, boost you mood, metabolism and sense of well being and offer several other positive spin - offs . Walking keeps the centre of gravity balanced between the two legs and stable enough to prevent falls or produce strain on the spine and joints. Walking is a low impact activity whereas running is a high impact activity when beginning an exercise program therefore one is advised to start with a low impact activity.

Walking Style

A correct walking style- walk with a heel toe - action poster is also very important even while speed walking. Keep the head up, shoulders back stomach tight, tilting the pelvis slightly forward, swing the legs from the hip joint in a double pendulum motion. Don't lock the knees and swing the arms keeping the bent at 90degrees to improve speed and momentum. Do not over stride take shorter; faster steps instead push off with the back end instead of trying to reach further with the front leg. This improves power and pace. At the workplace, fitness translates into creativity, positive attitude and ability to put in long hours . In other words, fitness is about being able to dream and it comes true. Physical and mental fitness are integral and crucial today. There is more awareness on stretch related problems and people are finding means to beat stress. we can see youngsters with high blood pressures and diabetes and it can be traced to stress.

Tread Mill Workout

When walking on the tread mill try not to hold the slide bars 20 % of your effort is lost if you hung on the bars trying to walk faster initially it takes some effort to get used to walking on a moving conveyer belt . With time however your body acclimatizes and you will soon find you're self in the "flow" so to speak while enjoying a walk. Walking on the tread mill gives one the opportunity to access the exact number of calories burnt increase the incline and speed to increase intensity at will. Provide a safe surface to walk on without the possibility of spraining your ankle in potholes and dodging traffic spewing noxious fumes.

Proper Diet

Food intake should be less than the energy expenditure includes vegetables and greens in the main meals. Plenty of fruit consumption is recommended but avoid fruits in juice forms. Increase foods rich in fiber content and decrease carbohydrate content moderate intake of food is rich in protein and cereals minimize taking food rich in fat and fried food.

Diet Rich in Fiber

Diet high in nutrients is the key to good health. so you can prevent or postpone the onset of disease by establishing more active lifestyles and healthier eating habits. A balanced breakfast springs you into peak levels through the day. It kick starts your body. A healthy breakfast consists of a variety of food-whole grains, low fat protein and a small amount of fat. When your body does not get energy first thing in the day, you cannot be active, there are low levels of concentration and your productivity is affected. One cup of plain cooked oatmeal has about four grams of fibre and 130 calories. Eggs are full of nutrients including protein vitamin A and B-12 folic acid and phosphorus. A traditional breakfast of idli, chutney and sambar has the right balance of vitamin B, carbohydrates, fiber and fat.

Positive Thinking

Positive thinking is the need of the hour to take over the stress imposed on human beings by the modern lifestyle. Accumulation of stress led to depression which in turn led to nervous breakdown. Positive thoughts drained much mental energy and mental resistance unable to cope with the stress, people react to incidents. Proper nourishment of mind through healthy spiritual thoughts, mental relaxation through meditation giving regular exercises on positive thoughts were the ways to get rid of negative thinking. This will help create a healthy state of mind and make people proactive rather than reactive. It will enable us to handle difficult situations and to overcome them. Being cheerful is a reflection of a positive disposition towards life. People, who are always happy, tend to do in all walks of life. The mental outlook that determines how one deal with every day stress, issues and other situations is a powerful tool in determining ones wellbeing happy is intrinsically important. If we are happy it has added knock on effects and benefits. These include us becoming more compassionate and feeling healthier both physically and emotionally. We become more creative, witty, energetic and fun to be around and it can also lead us to become more financially successful.

Let Yoga Don't Stress You

There is more awareness on stress related problems and people are finding means to beat stress. Stress brings down creativity and productivity levels in the minds of people. Yoga with its ancient blending of mind body exercise makes so much sense that it is no wonder its popularity is surging. It can be a great reliever of stress and can act as a human battery recharger. You will be ready to take the world after your yoga sessions.

Meditation

Meditation would help to unburden stress. Meditation is not a difficult procedure, but it needed continuous practice.

Yoga

Yoga founded in India 5000 years ago. The word "Yoga" means "yoke" or "unity" translated from Sanskrit, the classical language of India. It also means "discipline" or "effort."

Yoga- is an ancient art based harmonizing system of development for the body, mind, and spirit. The continued practice of yoga will lead you to a sense of peace and well-being, and also a feeling of being at one with their environment. Yoga means union, and comes from "yuj" which means "to join." Allowing people to bring together themselves in union to the various aspects of yoga. Yoga also recommends meditation, and cultivation of lovingness, compassion, goodwill and acceptance, as well as nonviolence, truthfulness, training the senses, non-possessiveness, and other such virtues. Religions also recommend such virtues, but it is self evident that these ways of being or living are not truly themselves. When these virtues are practiced in Yoga, the subtler, finer, truer aspects of our being are revealed to mind. You do this by Health us, in which may or may not be seen in the

context of religion. That choice rests with each individual person.

Meaning of Yoga

Yoga is an ancient philosophy of life as well as a system of exercises that encourage the union of mind, body, and spirit. Yoga derived from the Sanskrit word meaning "YOKE", or UNION. Ultimate goal of yoga is to achieve a state of balance and harmony between mind and body.

History of Yoga

Yoga comes from India starting BCE. It's lineage includes not one book, but many, including: the Upanishads (first millenium BCE to 1656), the Bhagavad Gita (first century BCE to second century CE), the Hatha Yoga Pradipika (1600's), the Yoga Sutras of Patanjali (100BCE and 500 CE).

Yoga Therapy

T. Krishnamacharya (1888-1989)taught yoga philosophy with emphasis on health. Two students influential in the development of yoga therapy include: B.K.S. Ivengar- (born 1918)- published "Light on Yoga" in 1966, which opened up yoga teaching and practice to westerners, T.K.V. Desikachar son of Krisnnamacharya and founded the Krishnamacharya Healing and Yoga Foundation. Pioneer in using yoga as therapy. "Being a yoga therapist requires constant self analysis and reflection. We must deepen our self-awareness before we

World Health Orgenisation (WHO) definition of health: "Health is a state of complete physical, mental & social well being and not merely an absence of disease or infirmity." This definition, however, considers health a state, while health is more a process of continuous adjustment to the changing demands of living.

Traditionally health is defined as absence of disease and this working definition is accepted by most citizens and even doctors, whose task is to repair human biological machine when it breaks down.

Grading of Health

- Cent percent fitness expected in high class athletes
- ٠ Better health in well nourished people
- Freedom from illness in average individual
- ٠ Unrecognized illness & minor illness in malnourished people.
- Life style diseases like diabetes, hypertension, joint pains etc.
- Major illnesses like cancers, heart disease etc.

Health has always remained one of the most neglected aspects of life. On the individual level it is subordinated to the other so called more important needs like wealth, power, prestige, knowledge etc. Health is often taken for granted and one becomes aware of its value only when it is lost.

"Life is full of pleasure, pain, tension, stress, and strain. Man is affected by inner and outer environment, social structures, competition, and never-ending struggle. He is afflicted within himself by anxieties, worries, desires, lust, anger, greed, aversion, hatred, temptations, and so on. Modern living has changed simple life into a complexity and affected the consciousness. .. Yogic methods give the maximum and the minutest techniques for the cure of a soiled body and mind. In this sense, yoga is therapy. The treatment for a disorderly mental and physical condition or disease by remedial techniques is called therapy." -B.K.S Iyengar

Sukhasana:- This is one of the classic Meditative Poses and is usually performed after doing the Corpse Pose. The Easy Pose helps in straightening the spine, slowing down metabolism, promoting inner tranquility, and keeping your mind still.

Shoulder Streches:- Shoulder Stretches are great in relieving stress and tension on your shoulders, as well as your entire upper back. Practice them daily for several weeks and notice the changes. Learn some basic stretches for the shoulders in this section.

Surya Namaskar (sun Salutation):-The Sun Salutation or Surya Namaskar is a yoga pose which limbers up the whole body in preparation for the Yoga Asanas. It is a graceful sequence of twelve Yoga positions performed as one continuous exercise. Learn how to practice Sun Salutation.

Half Spinal Twist (Ardha Matsyendrasana):- If done properly, the Half Spinal Twist lengthens and strengthens the spine. It is also beneficial for your liver, kidneys, as well as adrenal glands. Practice this Yoga Pose under the supervision of a Yoga instructor.

Half Spinal Twist (Ardha Matsyendrasana):-If done properly, the Half Spinal Twist lengthens and strengthens the spine. It is also beneficial for your liver, kidneys, as well as adrenal glands. Practice this Yoga Pose under the supervision of a Yoga instructor.

Stand Spread Leg Forward Fold:-Practicing the Standing Spread Leg Forward Fold can strengthen and stretch your inner and back legs and your spine. People with lower back problems should avoid doing the full forward bend. For beginners, you may use props like a folding chair to support your forearms.

Tree Pose (Tadasana):-The Tree Pose helps strengthen your thighs, calves, ankles and back. It can also increase the flexibility of your hips and groin. Your balance and concentration can also be improved with constant practice. This Yoga Pose is recommended for people who have sciatica and flat feet.

Double Leg Raises:- A Double Leg Raise is similar to a Single Leg Raise, only this time, you will raise both legs. In doing this Yoga Pose, make sure that the full length of your back is resting on the floor and your shoulders and neck are relaxed.

Fish Pose (Matsyasana):- Doing the Fish Pose relieves stiffness of the neck and shoulder muscles and improves flexibility of your spine. It is the counter-pose of the Shoulderstand. Hold the Fish Pose for at least half the amount of time you spent in the Shoulderstand in order to balance the stretch. **Corpse Pose (Savasana:**-The Corpse Yoga Pose is considered as a classic relaxation Yoga Pose and is practiced before or in between Asanas as well as a Final Relaxation. While it looks deceptively simple, it is actually difficult to perform.

Kapalabhati:- Kapalabhati is a Breathing Technique used specifically for cleansing. If you have a lot of mucus in the air passages or feel tension and blockages in the chest it is often helpful to breathe quickly..

Anuloma Viloma:- Anuloma Viloma is also called the Alternate Nostril Breathing Technique. In this Breathing Technique, you inhale through one nostril, retain the breath, and exhale through the other nostril.

The Benefits of Yoga

Increasing Flexibility

Increasing lubrication of the joints, ligaments and tendons

Massaging of ALL Organs of the Body

Complete Detoxification

Excellent toning of the muscles

The Four Foundations of Mindfulness

- 1. Contemplation of the Body Breathing, postures, body parts, elements, impurities, corpses.
- 2. Contemplation of Feeling Pleasurable, painful or neutral, how such feelings arise & vanish & is \ impermanent.
- 3. Contemplation of Mind State of mind they are in.
- 4. Contemplation of Mental Objects When present & absent, how they arise & vanish.

The Yoga Sutras outline 8 limbs, or principles of yoga:

- yamas- universal codes of conduct
- niyamas- individual codes of conduct
- asana- postures. Named for nature, animals, and sages of Yoga. Used to be primarily seated postures, which evolved to more dynamic postures
- pranayama- science of the breath

Basic areas to be tackled

- Diet & nutrition
- Oxygen, Air, Water
- Inner Cleansing (positivities and negativities)
- Yoga & Meditation
- Exercise, games
- Fun, laughter, joy
- Ownership for own health
- Love

Tips on day-to-day living

- Massage your body at least once a week.
- Brush your body before bath thoroughly.
- As for as possible use cold water for bath. In any case don't use very warm water.
- Expose your total body to sun rays for 10-15 minutes early morning daily.
- Bath should last at least 10 -15 minutes and take shower on head.
- Join some laughter club & indulge in boisterous laughter for 10-15 minutes daily.
- Maintain erect posture at all times.
- Drink 1.25 liter water on arising (+ TTK) and total of 5.5 liter in 24 hours.
- Drink water very very slowly.

- Take a large proportion of your food in raw form i.e., not cooked on fire.
- The food should be always undercooked.
- Maintain loving & harmonious relations with all people.
- Avoid air pollution & noise pollution as far as you can.
- Sleep in airy places. Keep the windows of the rooms open while sleeping.
- Calm your mind through sleep ritual before going to sleep.
- Reduce the consumption of white sugar, salt, maida, rice, oils, milk items.
- Take plenty of fresh fruits of all types in the season.
- Reduce the usage of preserved items & deep fried items.
- Develop some good purpose & meaning in life.
- Chew food at least 30 times each morsel.
- Read a lot. Always keep looking for new ideas for implementation.
- Omega three oils take regularly. These are good for the heart.
- Eat always in peace & calm.
- Don't eat when you not hungry. Don't forget to eat when you are hungry.
- Prefer to live only on two meals a day. In between light portions of fruit snack can be taken.
- Never, never, never, overeat.
- Save your time from deadly poisons of television & telephone and invest it in yoga, meditation & pranayam.
- Avoid sedentary life as far as possible.
- Wash your eyes twenty times (with water in your mouth) daily.
- Do either shirsharan or sarvangasan and if not then must do inclined plane for 15 minutes for blood flow to the brain.

- Avoid smoking, drinking, and pan masala etc.
- Limit your intake of tea / coffee to 2 or 3 cups a day. It is better if you give up totally. No tea/coffee after 1800 hours.

Conclusion

- Do not carry grudges of the past, worry for the future. Live in the 'PRESENT' with full focus on 'NOW'. Do your best.
- A small part of what we eat goes to give us energy. The rest goes to increase doctor's bill. The best option is to remain slightly hungry at all times.
- Train yourself to master the taste instinct. It is nice to eat tasty food with good nutrition. The pity is large number of tasty foods lack nutrition or are actually harmful.
- Remember the law of karma. The laws of nature are indestructible. It we do something, we can't but escape facing the consequences of our action. Our Karmas will keep chasing us till we have borne the consequences.
- The action taken in on & off spirit will not help. It has to be steady & regular.
- Remember we are totally in command. Then why not live the life, which the creator has designed for us.
- There is large number of small- small tips on day to day living, which one needs to make note & follow. The only thing to remember is that each is unique and though there are general guidelines for healthy living these need to be adapted to individual needs.
- Emotions of BLAME and SELF-PITY are deadliest poisons. So guard against these with nectar of LOVE & HOPE.

St. Thomas College of Teacher Education, Pala, Kerala

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St. Thomas College of Teacher Education, Pala, Kerala, India Website: www.stce-pala.info, www.stctepala.org email: educationalextracts@gmail.com

TEACHING PHYSICAL EDUCATION

Dr Augustine George* Sunil Thomas**

Abstract

Physical education is a vast subject with contributions from almost all the disciplines. Delivering quality physical education classes is a challenge to teacher with each individual different. Teacher has to come out with a teaching style and method accepted to the class. Physical education teaching aims learning theoretical concepts and motor skills. Learning motor skills is more or less a social process. Modeling or demonstration is an integral process of teaching learning in PE. Societal pressure has far reaching consequences as far as learning and performance in sports is considered. A teacher of physical education should be wise enough to use manipulative powers to turn the social forces acting in the teaching learning process for the benefit of the student.

Key Words: Motor skills, Modeling, Mental rehearsal, Motor reproduction, etc

Introduction

Physical education teaching comprise both classroom teaching and on the field teaching. Classroom teaching involves learning the scientific principles and theories. Whereas field teaching is all about implementing these learned theories into practice. Field teaching which comprises of teaching different exercises, skills of games and body movements is of great significance. Teaching right motor skills in line with biomechanics will help the learner to have gracious, yet effective body movements. Ineffective teaching may lead to injuries and other problems.

Teaching Motor Skills

There are four parts to teaching a new skill

- 1. Instructing instructions must be given for them to complete the task or skill. These may be written or verbal. The teacher must ensure that the student knows what is required of them.
- 2. Demonstrating the teacher may provide a demonstration of the skill or may get a peer to perform it. It is important that it is a good demonstration to allow the student to form a model in their memory and mentally rehearse the skill to be performed.

** Assistant Professor of Physical Education, St Thomas College of Teacher Education, Pala

^{*} Assistant Professor of Physical Education, Directorate of Collegiate Education, Government of Kerala. E-mail: augustinegeorge1@rediffmail.com, Mob: 9495114335.

- 3. Applying the student then practices the skill many times to master it and then apply the skill in a planned situation to help them transfer the learning from practice to competitive situation.
- 4. Confirming this is all about feedback and providing information to the student about how successful they have been. Testing or assessing the skill allows the teacher and the student to evaluate performance. One of the important ways of testing is by recording video. The video is then played in varying frequency with explanation to the student for better feedback about the skill they do.

Demonstrations and modeling

In P. E. demonstration and observation of others performing a skill is a vital way of learning. It has been shown that an individual's performance will improve most when the demonstration is from a skilled superior, such as a teacher or coach. However, demonstrations from unskilled peers also are often effective. In 1961 Albert Bandura came up with seven points which must be considered when using models and demonstrations for young people. These are:

- 1. Appropriate behavior in-line with social norms is more likely to be copied
- 2. Behavior is imitated if it is thought to be relevant to the individual
- 3. The more similar the demonstrator is to the individual, the more likely they are to imitate their actions
- 4. Teachers and coaches who are encouraging and approachable are more likely to be imitated
- 5. Powerful role models, such as professional sports people and celebrities are more likely to be copied
- Young people are more likely to imitate the behavior of models whose behavior is condoned by their superiors (parents/ teachers etc)
- 7. Consistent behavior is more likely to be copied

Bandura progressed further with this theory to develop a model to show the effect of demonstration on the learning of skills:



Effect of Spectators

The effect of having others present during performers can be either positive or

negative. Performers can suffer with evaluation apprehension, which increases

arousal levels which in turn increases heart rate and causes other detrimental effects. This is linked to Hull's drive theory. The following relates to how this increased arousal can affect performance:

The presence of an audience increases arousal. Increases in arousal will trigger the dominant response. If a skill is well-learned then the response will be correct. If the skill is new or poorly learned the response will be incorrect. There is also the question of crowd affects whether a 'home' performance. For some individuals a home crowd is an advantage due to the friendly encouragement. For others a home crowd which usually includes significant people like family members and friends increases the level of evaluation apprehension. The response of an athlete to a crowd may well relate to his personality type.

The negative effects of this social facilitation can be dealt with using the following tips:

- Relaxation techniques
- Imagery
- Explanation and understanding of the way in which audiences can affect individuals
- Encouragement and support from team members
- New skills should be taught in a nonevaluative way

The teacher ought to understand the various social forces acting in the teaching

learning process and use the manipulative powers of her to direct these social forces for the benefit of learner. as the first principle of teaching says 'know thy pupil' a teacher should be aware of the type of personality every student is a plan teaching style and method accordingly.

Conclusion

Teaching and learning is a two way process and adequate interaction among teacher and student is a must for effective transmission of the targeted educational extract. Multiple factors effect teaching motor skills and a teacher should be very attentive to all these factors for the good of learner.

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LEARNING OF MATHEMATICS: REFLECTIONS ON INNOVATIVE ENDEAVOURS OF JBCN INTERNATIONAL SCHOOL, BORIVALI, MUMBAI

Anu James*

Abstract

The purpose of this paper is to explain the need and benefits of using innovations in mathematics teaching. The innovative practices undertaking by JBCN International School, Borivali, such as First in Math, and Navnirmiti Eduquality Activities are discussed in this paper. The teaching and learning of mathematics is a complex activity and many factors determine its success. The nature and quality of instructional material, the presentation of content, the pedagogic skills of the teacher, the learning environment and the motivation of students are all important and must be kept in mind in any effort to ensure quality in the teaching-learning of mathematics. The value of using innovation, especially the use of manipulatives has been recognized for many years, but some teachers are reluctant to incorporate it in their lessons. It is important for children to have a variety of materials to manipulate and explore if they are to construct mathematical knowledge. In order to have opportunities to learn math, children need first hand experiences related to math, interaction with other children and adults concerning these experiences and time to reflect on the experiences. Educational research indicates that the most valuable learning occurs when students actively construct their own mathematical understanding, which is often accomplished through the use of manipulatives.

Key Words: *Mathematics, Learning, Innovations, Conception, Proposal, Adoption, Navnirmiti Eduquality, Game, Puzzle, etc.*

Introduction

Mathematics is one of humanity's greatest achievements of sophistication and beauty which epitomizes the power of reasoning. Mathematicians seek out pattern, formulate new conjectures and establish truth by rigorous deduction from appropriately chosen axioms and definitions. It is a core subject in our education system. In the 1960's, Mathematics education developed qualitatively by including the teaching of modern Mathematics. This development becomes necessary to prepare today's children to face the challenges of the future.

* HOD, Department of Science/Mathematics & Chief Examination Officer, JBCN International School, Borivali, Mumbai. E-mail: anu.k.james@gmail.com. Mob: 09619366042

It helps children to make sense of their world outside school and helps them to construct a solid foundation for all members of our society.

Since ancient times, Mathematics has been considered as an important subject and has been occupying an important position. Still, it has not been of interest to many students. Many of them have developed an aversion towards the subject. There are gaps between aspiration and achievement. Mathematics is highly abstract. It is concerned with ideas rather than objects, with the manipulation of symbols rather than the manipulation of objects. It is a closelyknit structure in which ideas are interrelated.Unless lower-level concepts are mastered, higher-level concepts cannot be understood.

The Innovative Endeavours of JBCN International School

JBCN International School believes in the maxim of learning through fun. The school is in association with various programmes/ organizations who practice this thoroughly in their activities.

1. First In Math (FIM)

Learners get immersed in an interactive environment where new skills are acquired progressively and improvement is continually recognized. In sports, kids take ownership of the practice necessary to improve, often with little guidance from adults. First In Math (FIM) facilitates this same response where students are eager to practice mathematics. The program provides DEEP PRACTICE, which is a neurological phenomenon, more powerful than normal practice. Skills that may take months of regular practice can be mastered in a matter of weeks, or even days, by tackling a complex subject in manageable parts. With immediate feedback for error correction, students take responsibility of their own goal of mastery learning—driving success in every area. Significant test results can be achieved in minutes a day, using Deep Practice.

First In Math®, an online program created by world-renown Chinese inventor; Robert Sun, has a unique international competition feature, where math becomes a sport to motivate students to solve more problems. Compared to worksheets, students excitedly and willingly solve 5 times more problems on First In Math. "Having journeyed with FIM as a parent, teacher and strategist, I bring this powerful tool to India and create the awareness of brain-based learning that transforms the school and family dynamic", says Ms. Monica Patel, CEO, First In Math, India. The community of JBCN International collectively solved approximately 15 lakh problems last year with the top player from Standard 4 having solved about 65,000 problems. Teachers and school leaders played a key role in motivating students to achieve excellence with First In Math.

Mrs. Fatema Agarkar, one of the trustees of JBCN schools, an enthusiastic and passionate educationist, spearheaded the implementation of this US based programme. 15 lakh students worldwide are using the program to master math skills. Comprehensive content is presented in a challenge format and gets students to love serious mathematics like no other program does.

JBCN Borivali was the #2-ranked FIM school in India for the academic year 2012-'13 and in the year 2013-'14 we reached the top position ie. #1 Ranked FIM school in India beating more than 20 schools across the country.

The school as a whole, including the teachers, irrespective of their subject areas, has embraced this program and is taking it forward this year as well. Some of the reflections on FIM made by eminent educationists are as follows:

"The First In Math® (FIM) programme is an excellent tool for drill work in mathematics. Mathematics is pegged on the 'cliche' that *practice makes perfect* and to a very large extent there is a lot of truth in it. Math teachers endeavor to provide this drill in traditional forms and students yearn for innovative and attention-gripping techniques. FIM has successfully integrated these requirements of both teacher and student to good effect. What impressed me most of FIM is that it supplements the efforts of the teachers and does not replace it", says Mr. Raymond Fernandes, Vice Principal. JBCN International School, Oshiwara, Mumbai.

"Math has been a subject that I have dreaded all my life. Glad to be in the Humanities stream, Math was kept miles away. At JBCN, as the homeroom teacher for Grade 8, I was introduced to First In Math which allowed for learners, class and teacher awards. I tried my hand at it, enjoyed the activities, learned concepts without stress and loved every moment. I was the top teacher player of the school and also topped the National level for consecutive periods throughout the year. I would recommend FIM to everyone, especially those that dread Math and I am sure that Math will become your favourite subject."- Ms. Snehlata Alphonso, Head of Humanities, JBCN International School, Borivali, Mumbai.

"The First in Math programme has encouraged my 6 year old to embrace mathematical concepts with eagerness and zeal. It has, in a fun filled way, shown him that you can perfect yourself in Maths only if you practice daily. It did also help his reading and comprehension skills. So it is a programme with a dual purpose." Ms. Florina Fernandes, HOD, English, JBCN International School, Borivali, Mumbai and mother of 6 year old Aaryan (JBCNite).

2. Association with Navnirmiti Eduquality

Navnirmiti is dedicated to acquiring, developing, innovating, producing and disseminating high quality, low cost/no cost (LCNC) learning methods, tools and systems to bring about universalisation of elementary mathematics and science skills and competencies. Navnirmiti (NN) conducts a number of mutually complementary activities to achieve the above objective. Navnirmiti reaches all those who otherwise would not have access to good education. Navnirmiti has developed a comprehensive 'Universal Active Math' programme and a complete classroom Math Kit to teach all primary level school mathematics through joyful methods.

An organization who has been working on the capacity development of teachers since many years, Navnirmiti eduquality has always been reflecting upon their experiences and milestones and even listened patiently to the concerns raised by the teachers about the practical constraints they face while implementing the non-traditional child-centered tools and pedagogy. While we do acknowledge the multi-tasking roles that the teachers have to take up in a given set of conditions, time-frame and environment, we also believe that there is still 'some' scope for improving the learning outcomes and experiences of our students, that we as teachers have always wished for and strived to achieve. And for transforming this possibility into a reality, the teacher needs to be 'continuously' in the learning (research, review and reflection) mode.

In Navnirmiti Eduquality (NE) a Section 25 company, Quality Education for Equality stands for access to good quality education to all, to create innovate and propagate best educational systems, methods and practices for high quality learning. As Self-reliant, Not for Profit organization it is a Self-funded, organisation aimed to build social institutions to *achieve its larger social and educational vision*. Navnirmiti Eduquality is a self reliant social enterprise working for universalisation of quality education for all.

With 'Quality for Equality' as its motto, NE is strongly focused on developing high quality, low cost/no cost (LCNC) learning methods to teach elementary science and mathematics in creative and innovative ways that make learning a joyful process. Navnirmiti has a special focus on math and science education. The organisation makes continuous innovations in educational tools, toys, puzzles, hardware and software. It works for implementing the quality mandate of the Right to Education Act and the NCF 2005, of quality education for equality of outcomes. 'Understanding by doing', the very popular philosophy of Confucius features prominently in all our educational activities catering to most schooling segment challenged by learning lack of understanding.

Be it training teachers-training or educating children, their focus is on providing a hands-on experience by working with the resources through methods of demonstration; and this is what is integrated into all its practices of teaching learning. It integrates the hands on activities, learning by doing and learning practices across the world.

Alternative methods which emphasis on 'do and discover' approach are being developed and promoted by the trust. Navnirmiti conducts intensive primary maths improvement programmes in tribal, municipal and private schools.

There is a strong need for a motivated teachers' peer-group community (online as well as offline) which can not only act as a pool for the teachers to regularly and easily acquire the knowledge of better math teaching-learning practices from their peers and other math experts across the globe, but can also help to recharge and rejuvenate the teachers, keep them engaged in meaningful dialogues/ discussions, sheds light upon new/ better strategies and facilitate the sharing of classroom experiences, success stories, failures and interesting ideas of teachers from various schools. Keeping this in mind, Navnirmiti Eduquality has come up with an idea of Mathematics Energizer, a tool that will try to bind all (teachers from various schools, teacher-educators and probably even mathematicians from research institutes) together in some way. The purpose of this

tool is to stimulate research/ action/ dialogue among these teachers, stir up and then direct the energy of the teachers of this community towards something constructive.

To make the things easy and interesting to begin with, they have tried to paint this Mathematics Energizer with various shades like Game, Puzzle, Activity, Magic (Math trick), Video, Article, Analysis of student's solution, etc.

Game – Share with us how you varied/ adapted/modified this game to suit your requirements and levels of your students, your experience while playing these with your students, etc.

Activity – How the discovery happened, we and all the other teachers would LOVE to hear from you about your class flow, share with us the formula you discovered, if this idea/ activity sparked off another idea in your mind and you plan to take it ahead, any super interesting thing that would like to share with other teachers in this community that may excite/ help them (and even motivate you), etc.

Puzzle – Solutions, how your students took it, how you made them discover the solution by just giving them appropriate hints, various approaches, etc.

Analysis – The most interesting part of Energizer. Learning from students' mistakes!

Magic (Trick) – How did your students react to this the first time they did this, how did they (and even you) figure out the math behind this, etc.

Video/Article – Your views/comments/ opinions about the content and its speaker/ writer and how that helped you/will help you. The 'content' of Mathematics Energizer is just an instance, a medium to stimulate dialogue/learning but the real learning/ development will happen only when we use the power of our peer-group community and make the best out of this 'process' (by thinking and working on the stuff and then sharing and learning from each other).

A workshop has been organized recently for all the Math teachers of JBCN, Borivali where their skills on various topics have been drilled upon by inculcating excellent questioning skills which they think can do wonders in the class. JBCN teachers have been attending workshops very frequently which are mostly organized by Navnirmiti.

"I am glad and even proud that, though unconsciously, I almost always followed method of Inquiry --- (though little did I know about Socrates and even his philosophies of teaching/learning until few months back and that's when I even stated promoting it --- to whomever I meet, wherever I go).... "Never give answers to the students...And only ask Right questions at Right pace with Right tone....that lead the pupils to "discover" the answer on their ownand this besides building their confidence and interest also puts them on the right track - to question, to reflect, to persist, to self-learn, etc (the utmost desired human traits but (unfortunately very) difficult to see in most of the adults in modern times) and besides not (cruelly) depriving the pupils of the Joy that discovery brings with it....and of course in this process, you too even get enough opportunities to Dance with them in the Joy of Discovery. So Proud to be an Educator!! And more - A School Math Educator!! (& no more an engineer)" - Rupesh Gesota,

"Being associated with Nanirmiti has been a wonderful experience for me .Their passion and vision for making math a fun loving and interesting subject rather than a much dreaded one is extremely noteworthy and very contagious. With the amazing resources that they have provided like the Navnirmiti kit and the numerous workshops that they have conducted for our teachers, I can safely say that it has helped them gain a great deal of insight into hands on math teaching practices and using innovative methods in the classroom to attain higher levels of conceptual understanding in children. With continued association I'm sure we will soon have joyous Math learners who are also independent, critical and integrated thinkers." Ms. Smitha Manoj, Primary Co ordinator (Mathematic/Science), JBCN, Borivali, Mumbai.

3. Singapore Math workshops

Singapore Math workshops also have been attended by the teachers and all those strategies are beautifully been carried out in our regular sessions.

4. The School's Math Club

The club is named as *Maðhlete* and it is designed to foster learners' mathematical curiosity and positive attitudes about math. It stimulates a community of students around a common interest in mathematics. The Club members will engage in activities that promote the appreciation and pursuit of mathematics. The following were the activities conducted during the year 2013-14.

- Tangrams and uses of geometry
- The different types of angles seen in the world around us in our daily life eg.

Angle between leaf and leaf petioles. (Learners measured different angles of different branches) and its importance.

- Ordinal numbers "The great race" solved a puzzle
- Card game equations with one variable.
- The water audit in the school premises and uses of math in relation to environment.
- Math puzzles in the Math lab
- Estimation of the height of the building based on the height of one stair case.
- Videos on math showing common errors while doing mathematical calculation and operations.

5. School Math Lab

A minimum of one math session in a week is being planned in the Math lab which is well equipped with a plethora of manipulatives and teaching aids where the learners get to explore Math in a non instructional and carefree manner. They learn by doing things on their own and become masters through their own mistakes. Other regular sessions also mostly comprise activities which give them an insight into the real life applications of Mathematics.

Thanks to our Honourable Chairperson Mrs. Pinky Dalal and the trustees Mrs. Fatema Agarkar Mr. Kunal Dalal and Mrs. Hemali Dalal the true educationists who actually know what education is and which best way the knowledge can be passed on to the young generations. Above all the true pillars of JBCN Borivali –Principal Mrs. Debika Chatterji and Vice Principal Dr. Narendra Shetty, the leading lights who guide us, inspire us and motivate us in all our accomplishments the impact of which is reflected in all our achievements.

"It is heartening to see the involvement and dedication of math teachers towards promoting math learning in the school through a variety of teaching aids and diverse methodology. It pleases me to see the joy and excitement on my children's faces when they are involved in the various activities; be it the math sessions in the lab or the Maðhlete club activities or the healthy competition among them during the FIM programme." – Debika Chatterji, Principal, JBCN, Borivali, Mumbai

"Mathematics is a necessary skill for daily-life as it helps to foster some of the essential life-skills like logical reasoning, rational thinking, analyzing, problem solving and ability to persevere - attitudes which go a long way in the overall development of an individual. And no wonder, we see many organisations struggling to find independent thinkers, innovative problem solvers and calculated risk-takers who can play lead roles for today's real life challenges. Through Learning by Understanding, I firmly believe that Math can be learnt by all and can even be mastered, if only taught in the right way." - Dr Narendra Shetty, Vice Principal, JBCN, Borivali, Mumbai.

It is commonly believed among teachers and educationists that mathematical ability is an inheritable special ability. Generally pupils find mathematics to be a difficult subject and develop a negative attitude towards it. Difficulty in learning mathematics is found across all ages and in all socioeconomic classes. Mathematical abilities include the confident use of mathematical symbols, an intuitive grasp of mathematical patterns and relationships, generalizing from the study of examples, remembering generalized mathematical relationships, the rapid grasp of new material, the rapid grasp of direction of a problem, manipulating algebraic expressions, the ability to reverse mathematical processes, developing a clear mental picture of a problem, the ability to view a problem from different angles, logical reasoning, thinking flexibly and so on. It is essential to develop these abilities among school children for their academic achievement.

Need and Significance of the Study

Building a solid foundation in mathematics requires different skills. Mathematics is a subject which requires various skills such as perceptual reasoning, verbal reasoning, counting and calculating. If basic mathematical skills are not mastered, school children may find it difficult in moving on to more advanced mathematical applications. Kinard (2000) defines Rigorous Mathematical Thinking as the synthesis and utilization of mental operations to;

- derive insights about patterns and relationships.
- apply culturally derived devices and schemas to elaborate these insights for their organizations, correlation, orchestration and abstract representation to form emerging conceptualizations and understandings.
- transform and generalize these emerging conceptualizations and understandings to coherent, logically bound ideas and networks of ideas.
- facilitate problem solving and derivations of other novel insights in various contexts and fields of human activity.

 perform critical examination, analysis, introspection and ongoing monitoring of the structures, operations and process of rigorous mathematical thinking for its radical self understanding and its own intrinsic integrity.

The teaching of mathematics is not only concerned with the computational knowhow of the subject but is also concerned with the selection of the mathematical content and communication leading to its understanding and application. So while teaching mathematics, one should use the teaching methods, strategies and pedagogic resources that are much more fruitful in generating interest in the students. The teaching of mathematics is an art and many factors determine the success of this process. The nature and quality of instructional material, the presentation of content, the pedagogic skills of the teacher, the learning environment, the motivation of the students are all important and must be kept in view in any effort to ensure quality in teaching-learning of Mathematics. The process of innovation generally comprises three processes ie. conception of an idea, proposal of the idea and finally the adoption of this idea. Many ideas have been conceived to bring about changes in the teaching process; these are yet to be proposed and adopted.

Objectives of the Study

- 1. To find out the different innovative strategies used by Mathematics teachers to enhance Mathematics learning
- 2. To find out the percentage of teacher participation in various training programmes.
- 3. To analyse the classroom barriers in Mathematics Teaching

- 4. To find out the limitations in Mathematics teaching.
- 5. To discuss the innovations in Mathematics teaching-learning process

Methodology Adopted

Primary research was done on a sample size of 50. The target population is a group of Mathematics teachers teaching different levels including Pre-primary, Primary, Secondary and Higher Secondary levels. In all levels of Math teaching, introduction of innovative methods make a difference in the teaching learning process. Whichever be the level, the conventional monotonous "chalk and talk" way of teaching leads to boredom and fatigue among the students. Pre-primary and primary levels are more crucial as most of the concept building happens in these stages. So it is the teachers' duty to see that this is achieved in a constructive and effective way. For this the teacher has to update himself/herself and discover new ways to satisfy the changing needs of the hour.

The sample for this study is taken from a group of Mathematics Teachers from JBCN as well as other schools in the vicinity. The size of the sample is 50. The tools and techniques employed are;

- Questionnaire: A set of 8 Questions related to Math learning were prepared. It was given to 50 teachers and the responses were analysed.
- 2. Interviews with Math teachers: Collected information regarding the various innovations which can be employed in the class rooms
- Lesson observations: Observed and compared the Math sessions with / without innovations

Analysis of the Collected Data, Findings and Discussion

The field of mathematics teaching is highly demanding nowadays and the majority of Math teachers are adopting innovative ways to cope up with the increasing demands of the present generation in order to increase or maintain the attention span and interest level of the learners. The data collected is analysed under four heads as follows based on the objectives of the study.

Innovative Strategies Employed by the Teachers

The first objective of this study is to find out the different innovative strategies used by Mathematics teachers to enhance Mathematics learning. The data is presented in table -1.

Table 1

Different Strategies Employed by Mathematics Teachers

Teaching Strategies	No	%
Showing Videos	28	56
Hands on Activities	41	82
Real Life Examples	41	82
Using Manipulatives	20	40

From the above table it is clear that, majority of teachers use hands on activities and real life examples for their teaching process. 56% of teachers show videos to enhance mathematics learning. Only 40% of teachers use manipulatives for teaching

Participation in Training Programmes

The second objective of this study is to find out the teachers participating different training programmes to enhance Mathematics teaching-learning process. The data is presented in table -2.

Table 2

Number and Percentage of teachers undergone training

Attending Training Programmes	No	%
Workshops	34	68
Training classes	14	28
Other faculty Improvement		
programmes	02	04

Table 2 clearly presents that 68% of teachers participate in workshops organized for teachers and the rest participate in other relevant training programmes.

Classroom barriers in Mathematics Teaching

The third objective of this study is to find out the classroom barriers in Mathematics Learning. The data is presented in table -3. Table 3

Classroom barriers for effective mathematics teaching

Classroom barriers	No	%
Lack of Training	13	26
Unwillingness to work	6	12
Unrealistic Time Target	26	52
Unavailability of Manipulatives	8	16
Breakdown of Classroom		
Management	13	26

From the above table, it is clear that an unrealistic time target is the most challenging barrier in mathematics teaching in the school. Lack of timing, breakdown of classroom management, unavailability of manipulatives and unwillingness to work, etc are other significant barriers to mathematics teaching.

Limitations in Mathematics Teaching

The fourth objective of this study is to find out the limitations in

St. Thomas College of Teacher Education, Pala, Kerala

Mathematics teaching. The data is presented in table -4.

Table 4

Limitations in Mathematics Teaching

Limitations in Mathematics		
teaching	No	%
Difference in Academic Abilities	19	38
Special needs	14	28
Uninterested Students	14	28
Disruptive Students	24	48

The above table presents the summary of the limitations in mathematics teaching. The disruptive students (48%) and differences in academic abilities (38%) are the major limitations in mathematics teaching. Students with special needs (28%) and uninterested students (28%) also cause obstructions.

Innovations in Mathematics Teachinglearning process

The fifth objective of this study is to discuss the innovations in the Mathematics teaching-learning process. The following are some innovative methods which can be employed in a mathematics class room:

Play-Way Method: This method consists of the activities that include a sort of fun or play and give joy to the students. Here the students don't realize that they are learning but in a way they are gaining knowledge through participating in different activities. This method helps to develop interest in mathematics, motivates students to learn more and reduces the abstract nature of the subject to some extent. Example: Mathematical games and puzzles. (Tangrams) Laboratory Method: This means "Learning By Doing". This method leads the students to discover mathematics facts on their own. The students take pride in their achievement and this motivates them. Eg. To learn the property of a triangle ie. "Sum of the lengths of any two sides should be greater than the third one".

Activity using broom sticks: Learners are given a few broom sticks and are asked to make a triangle. Then they will break them into many pieces and try to make the triangles out of them. Finally, a stage will be reached where they can't make a triangle with the broken pieces. So by actually trying out the various possibilities, they arrive at the correct conclusion.

Showing Videos: videos of the simulated of real situations shows more significant results.

Use of Manipulatives - Eg: Teaching integer addition using JODO cubes where different coloured cubes are used to represent positive and negative numbers (Red can be used for positive and Black for negative).

Real Life Links: Eg: Congruency of triangles, UK Flag, 'Khafre' Pyramid in Africa etc. can be connected to the concept where we can see congruent triangles.

Role-plays: role-plays of the students in the class gives more clarity related to their role, calculation, differential analysis, etc.

Discussion of the Results

There are different ways to enhance the learning process like showing videos of the related topics, make them do hands on activities, relating the concept to the real life examples and, above all, the availability of a
plethora of manipulatives, the use of which proved to be the most effective way of introducing the concepts to the learners.

Manipulatives help in building understanding and clarifying the doubts

These are the objects used by students which enable them to actively learn a concept. They get the real feel of the concepts actually working with the familiar common objects. If used effectively, students will have a strong mathematical foundation. Perceptive students may not always need manipulatives to be successful, but they will enhance their understanding of the concept. For those students who do not understand the concept when it is introduced, using manipulatives when re-teaching is important.

Engagement, Communication and Multisensory Experiences

When they do some activities in groups, explore new ideas and explain their understanding they have something to talk about when they work with manipuatives and models. Discussion and learning will become more focused and all of them take part in the activities. Thus, multisensory experiences provide access to concepts and ideas involved. Every class room is a mixed bag in terms of academic capabilities. There may be a few with some sort of learning disabilities and some with some special needs. All these categories should be addressed and dealt with in different ways. The teachers' creativity plays an important role in this regard. She /he has to continuously change her tactics/strategies in order to develop and sustain the interest and enthusiasm of the learners. The pen and paper should come in the picture only at the end of this process.

Till that time, the learners should be allowed to explore in their own way and the teacher's role should be as that of a facilitator.

Conclusion

We should acknowledge the importance of developing learning and teaching practices that recognise the diversity of the student body. Diversity is understood in its broadest sense. We recognise that inclusive Mathematics education entails designing curricula and preparing learning, teaching and assessment activities that meet different student needs and learning styles from the outset, and are also sufficiently responsive to the particular needs of individual students. Once the teacher discovers innovative ways to arouse interest and enthusiasm in the class, he will be able to use these ideas again the following year, since those will be new and fascinating to a different class. But as time passes, the world undergoes a change, the environment surrounding students changes and their needs also changes, so one has to continuously go on modifying and discovering new ways of teaching which proves him a better teacher.

Incorporating Innovation into mathematics lessons in meaningful ways helps students grasp concepts with greater ease, making teaching most effective.

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RELEVANCE OF OSPE IN MEDICAL EDUCATION

Jasmin James*

Abstract

Objective structured practical examination or OSPE is an assessment tool in which the components of clinical competence are tested using agreed checklist and rotating the students round a number of stations. The OSPE was used as an objective instrument for assessment of laboratory exercise in pre clinical sciences. The OSPE appears to be a reliable device with a good capacity for discriminating between different categories of students.

Key Words: *Objective structured practical examination (OSPE), Clinical competence, Procedure station, Question/response station.*

Introduction

The traditional system of practical examination in medical field consists of either assigning a procedure to a student or a patient for identifying the needs and problems. This depends upon student's ability and availability of the patient for a particular procedure. Realising the problems related to the conventional practical exams the department of physiology (Nayar et al, 1986). at All India Institute of Medical Sciences introduced a new pattern of practical examination called OSPE, objective structured practical examination which has greater objectivity, reliability and validity.

OSPE is a new pattern of practical examination in which each component of clinical competence is tested uniformly and objectively for all the students who are taking up a practical examination at a given place. Through OSPE one gets a reasonable idea of the extend of achievement of each student in every practical skill related to a particular discipline. It can be used for formative and summative evaluation.

Steps of OSPE

- Demonstrates practical skills
- Make accurate observations
- Analyse and interpret data
- Identify the patients problems
- Plan alternative interventions

Types of stations

In order to have a comprehensive appraisal of the student performance during OSPE different types of station are planned and organised alternatively that includes

Procedure station - It requires a student to perform a task. When a student performs the task, simultaneously she is

* Associate Professor of Medical Surgical Nursing, TMM College of Nursing, Thiruvalla, Kerala. E-mail: jeemonparappallil@gmail.com, Mob: 9446360335. observed and marked against the checklist being prepared in advance, by a silent but vigilant examiner. Eventually, the students get a score according to the skill demonstrated by her.

Question station/ the response station - The students answers the questions being asked on the answer sheet provided and leave it in the place specified. Usually the question station may have a question related to the procedure station.

Scoring students in OSPE

For each specific skill, a check list is prepared by breaking the skill being tested into essential steps and score is assigned to each step which is proportional to the importance of the step related a particular procedure.

The objectivity in assessment is achieved by getting each component tested at one particular station by the same examiner and has the students rotate through all the station. The time allowed is same for all the stations. Three to five minutes is the length of time allocated to each station.

Procedure of conducting OSPE

Examiners A B C stand in a place from where they can have a good view of what a candidate is doing at a particular station. They have a checklist on which they tick as they observe. The score of each student is entered separately and confidentially. The questions for stations are specific, short and worded unambiguously and printed on a separate sheet. The key to the question should be prepared in advance.

The students are given clear instructions regarding how they will rotate around the

stations and the time limit in each station and what they are supposed to do in each station.

At the end of OSPE the checklist of examiners A,B,Cpertaining to a given candidate and her answer sheets are put together to give her a final score. Through OSPE one can find out at what particular step in what specific procedure the student has made an error and a subsequent feed back can be given to rectify her mistakes, instead of making a general comment like performance was good or most of them did well.

Advantages of OSPE

- It is more objective, reliable and valid than the traditional system of examination.
- All students are subjected to the same standardised tests.
- Emphasis is shifted from testing factual knowledge to testing of skill that to in a short time.
- It helps to ensure a wide coverage of all practical skills.
- It ensures interaction of teaching and learning.
- There is increased faculty student interaction
- A large number of students can be tested within a relatively short time.

Limitations of OSPE

- The simulated situation may not reflect the real life situation.
- Students cannot be assessed for difference skill such as IPR, communication skills, and dexterity in handling equipments.
- Empathy towards the patients cannot be evaluated.

- It may be time consuming to construct an OSPE.
- It cannot be used by a single person it needs more resources in terms of man power, time and money.
- Careful organisation is required since all station require equal time.

Conclusion

OSPE ensures computability and integrity in educational system and gives directions for attaining the ultimate aim of the teaching learning process.

It would be ideal to use an OSPE in combination with the traditional system of practical examination as both these approaches would enable the examiner to assess the multiplicity of skills in the students in a given situation.

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DEVELOPING MATHEMATICAL APTITUDE TEST

Dr. Rajni Bala*

Abstract

Based on the components of the mathematical aptitude, a test has been developed to measure various dimensions of mathematical aptitude on different samples. Details are presented about the psychological nature of the test, items, selection, tryout, scoring and item analysis. Different procedures followed for estimating reliability and validity of this test are presented. Data are also represented regarding the difficulty value and discriminative power of the test.

Key Words: *Mathematical Aptitude, Sequence, Direction, Simplification, Geometry, Counting, Comparison, etc.*

Introduction

An aptitude is the potentiality a person has, to succeed in an occupation and school attainments. It has relation to the future plans of a person. In referring to a person's aptitude for mathematics or arts or carpentry or law, we are looking to his future. His aptitude is, however, a present condition, a pattern of traits deemed to be indicative of his potentialities. According to Warren's Dictionary (1934), "Aptitude is defined as a condition or set of characteristics regarded as symptomatic of an individual's ability to acquire with training, some knowledge, skill, set of responses such as the ability to speak a language, to produce music etc."

According to Good's Dictionary (1973), "Aptitude is defined as a special ability, talent and potential capacity for learning a certain mental or physical operation or it is a mental

capacity that indicates the probability of particular line of success in a endeavour." Aptitude also plays a very important role in the development of the personality of an individual. Hence it becomes one of the most important functions of the counselor to find a particular aptitude in child. By knowing the mathematical aptitude of the child, he can be guided to adopt such a profession which requires the mathematical knowledge and mathematical insight. It is said that mathematical aptitude is related to academic achievement. In other words, mathematical achievement of a child to a great extent depends upon his mathematical aptitude.

According to Bingham (1937), "Aptitude tests do not directly measure future accomplishment. They make no such prediction. They measure present

* Assistant Professor in Education, Teaching of Mathematics, Bhutta College of Education, Bhutta, Ludhiana, Punjab. E-mail: rajnigupta2000@rediffmail.com, Mob: 09855266011 performance. Then, in so far as behaviour, past and present, is known to be symptomatic of future potentialities. The test data supply a means of estimating those potentialities. The estimate is necessarily in terms of probabilities only."

As our society becomes more and more dependent on high levels of computer-based technology, it becomes increasingly important that children should grow up with a basic competence and familiarity with numbers, and they should feel at home in the world of calculation and computation. Of course, there are many children who easily develop a familiarity with numbers, yet there are also many children who think that mathematics is like learning a foreign language and approach numerical problems with a mixture of confusion and helplessness. Some of these children manage to grasp the concepts in school, by picking up a collection of techniques, tricks and rules of thumb. These may suffice them to get through the exams, but they may be only hazily understood. Other children do not do this, and remain totally at sea. Pedagogical psychology has proved that aptitude of the children and youth are shaped and developed in the process of activity, requiring the utilization of those qualities of a personality which form abilities to this kind of activity. The experts of the UNESCO Planning Mission (1985) found that in many schools of India the work is under way in developing the abilities of pupils. A number of schools organize, during and out of classes' activities; in which the pupils show aptitude. Here is an example of Bombay Multipurpose School 'Amulakh Amirchand' which launched various creative activities for pupils in its club.

Most of the researchers have focused almost exclusively on differential aptitude, teaching aptitude, scientific aptitude, but with the new focus on mathematical aptitude, the present tool will be of great help for measuring the mathematical aptitude of the individual. It assesses the individual's ways of behaviour which serves to indicate how well he can learn to meet and solve mathematical problems. The detailed steps followed in the development of the Mathematical Aptitude Test are as follows.

The procedure of test construction consists of four steps planning, preparing, trying out and evaluating. Item analysis is done in third step. The procedure starts with identification of components and ends with a refined tool which has some specific characteristics. Anastasi (1971) has defined psychological test to be "An objective and standardized measure of a sample of behavior." In the process of making test objective and preparing it as a standardized tool, there should be at least essential characteristics namely objectivity, reliability, validity and norms.

Collection of Items

Before developing mathematical aptitude test, the investigator has gone through various aptitude tests for example – Scientific Aptitude Test for college student (Sinha and Sinha, 1971), Mechanical Aptitude Test Battery (Sharma, 1990), Engineering Aptitude Test Battery (Swaran, 1992).The researcher first identified different components where in variations in the students' mathematical aptitude was possible. Then consulted recent literature available and the aptitude tests developed by NCERT and SCERT such as the Punjab State Board of Technical Education and Industrial Training and various other agencies which conduct aptitude test in their entrance and also aptitude tests given in Competition Master from time to time. Previously conducted studies as well as subject experts of schools, colleges and universities engaged in the field of mathematics and related areas were also consulted to frame the items of "Mathematical Aptitude Test." Based on the study of relevant literature and discussion with experts the researcher then framed 62 items under 15 components to measure the mathematical aptitude of the students. Table 1 represents the distribution of items in 15 components of mathematical aptitude test.

Table 1

Components to be included in Mathematical Aptitude Test with number of items

Sl.	Name of component/	No. of
No.	dimension	Items
1.	Complete the series	6
2.	Odd one out	5
3.	Sequence	5
4.	Direction	3
5.	Percentage	4
6.	Simplification	9
7.	Ratio and proportion	4
8.	Relationship	3
9.	Geometry	3
10.	General aptitude	5
11.	p-chart	3
12.	Graph	3
13.	Complete the figure	4
14.	Counting	3
15.	Comparison	2
		Total $N = 62$

Then the test with 62 items was discussed with 13 subject experts to give their opinions regarding the difficulty, relevance of the items in a particular component as well as language, vagueness and ambiguity of items if any in the construction of mathematical aptitude test.

Out of 62 items 17 items were rejected by most of the experts. Care was taken that item will be selected keeping in view the objectives of the test. The literature resources consulted for drawing and collecting the items are given in the reference section of this paper. Finally, this test included 45 items.

Item Selection

In order to make the test effective and useful, the relevance of a particular item was determined in terms of its relationship with various dimensions of mathematical aptitude. The items were thoroughly screened and edited. Some definite criteria were followed in selection and editing of items. The test comprised of 45 items under 15 components having four options 'a', 'b', 'c', 'd' to give response. Reasonable space was provided for the rough work on the right hand side of each item.

Tryout and Scoring

Having finalized the instructions, administration and scoring procedures, preliminary tryout was administered on a sample of 40 school students. The respondents were instructed to tick right mark for their right response for each item. There was no time limit but students took 35-45 minutes to complete the test. The procedure of scoring for right response was 1 and for wrong response was 0. This administration of the test was done with the view to know the deficiencies and difficulties of the students in solving the questions. They were given test booklets containing 45 items. After scoring of this Preliminary tryout, 10 items were rejected in which students felt difficulty in terms of solving the items. This form of the test included 35 items in the form of a booklet.

This booklet was then administered to 200 school students of XI class from 5 randomly selected senior secondary schools for final try out.

Table 2

Item Analysis

Item analysis was carried out to eliminate the inconsistency of the items. Two statistical measures were used in order to analyze each item. First statistics was to calculate difficulty values of 35 items. The items which had difficulty value within the range of 0.20 to 0.90 were retained. The items which had difficulty value lower than 0.20 and higher than 0.90 were rejected at this stage. This resulted into rejection of 5 items numbering 3, 11, 16, 23 and 31. Table 2 represents the difficulty value of items remained after final tryout.

Difficulty	value of items rer	mained afte	er final tryout	
Item No.	Difficulty value	Item No.	Difficulty value	Ite

Item No.	Difficulty value	Item No.	Difficulty value	Item No.	Difficulty value
1	0.54	13	0.48	25	0.41
2	0.42	14	0.90	26	0.73
3	0.16	15	0.46	27	0.58
4	0.78	16	0.92	28	0.70
5	0.67	17	0.65	29	0.73
6	0.56	18	0.42	30	0.75
7	0.23	19	0.59	31	0.92
8	0.85	20	0.33	32	0.83
9	0.74	21	0.84	33	0.38
10	0.90	22	0.60	34	0.31
11	0.97	23	0.11	35	0.29
12	0.72	24	0.48		

Another statistical measure used for item analysis of a test was calculating the discriminative power of items. The term 'discriminative power' of an item is used for item reliability and item validity. The discriminative power for 35 items were calculated, which have been presented in table 3. For this, upper 27% and lower 27% cases were taken. The total number of students who gave right response in upper half (RH) and who gave right response in lower half (RL) were calculated. The discriminative power was calculated by subtracting RH and RL and divided by N (N=54). The discriminative power ranges from +1 through 0 to -1. The inferiors answer

correctly but the superiors cannot answer correctly, shows negative discrimination. The items having discriminative power less than 0.2 were rejected at this stage. This resulted into rejection of 5 items numbering 3, 11, 16, 23 and 31.

Table 3

Item	Discriminative	Item	Discriminative	Item	Discriminative
No.	Power	No.	Power	No.	Power
1	0.30	13	0.60	25	0.55
2	0.52	14	0.3	26	0.22
3	0.11	15	0.56	27	0.33
4	0.24	16	0.18	28	0.22
5	0.33	17	0.33	29	0.41
6	0.26	18	0.81	30	0.37
7	0.55	19	0.48	31	0.11
8	0.30	20	0.48	32	0.37
9	0.52	21	0.48	33	0.62
10	0.07	22	0.33	34	0.55
11	0.04	23	0.07	35	0.44
12	0.30	24	0.37		

Discriminative power of items remained after final tryout

In this way, 5 items were rejected. Hence Mathematical Aptitude Test in its final form comprised of 30 items.

Reliability

Reliability is one of the most important characteristic of any test and measuring instrument "Reliability means consistency of scores obtained by same individual when reexamined with the test on different sets of equivalent items or under other variable examining conditioning (Anastasi, 1971). There are many procedures by which the reliability of the test measures can be established. Guilford (1980) has suggested three general categories namely:

- Alternative forms reliability.
- Internal consistency reliability.
- Retest reliability or test-retest reliability.

All these forms have a common approach of obtaining the two sets of measures from the same scale and administer to the same sample for the purpose of finding coefficient of reliability.

As the scale being heterogeneous and statements having been arranged logically, the two halves could not have been identical. Therefore, test-retest reliability was found to be the most suitable for this scale. The reliability study of the test was conducted over a sample of 30 students. The second administration of the test was given after a month. The product moment coefficient of correlation for the two scores was computed. The coefficient of correlation between two scores was found to be 0.64. This coefficient of correlation is high, which testifies the soundness of the test.

Validity

Validation of any test is difficult if it is understood in terms of what the test purports to measure. An index of validity shows the degree to which a test measures what it purposes to measure when compared with accepted criterion (Freeman, 1962). A variety of validity types have been suggested by experts in the field of test construction, like Thorndike and Hegan (1962), Ebel (1966), Gronlund (1968), Anastasi (1971), Guilford (1980) and many others, with variations of nomenclature in the terminology used. But in the standards for Educational and Psychological Tests (1974), these procedures have been classified under three principle categories: Content, Criterion - Related, and Construct Validity. Fundamentally, all these procedures are concerned with the relationship between performance on the test and other independently observable facts about the behaviour characteristics under consideration.

Mathematical attitude scale was validated against criterion of "content validity". The content validity is concerned with the adequacy of sampling of a specified universe of content. To determine the content validity, the test items and a list of outcomes was given to the panel consisting of 5 experts in the subject of mathematics and 8 experts in test construction. The panel was asked to identify which test item corresponded to which component. The experts agreed 92% with the investigator on the assignment of scale statements. This concurrence was taken as evidence of content validity.

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GENDER DIFFERENCE IN RELATION OF MATHEMATICAL CREATIVITY WITH ACHIEVEMENT IN MATHEMATICS

Dr. Malini P.M*

Abstract

Mathematics plays a major role in determining the strength of any nation's work force. It is the only subject whose knowledge is needed for the whole life. Investigator's experience as an educator of Mathematics made her think about gender differences in Achievement in Mathematics and in the psychological variable Mathematical Creativity. In the mathematical domain the present knowledge is that gender differences emerge in adolescence and appear to increase particularly on tests involving reasoning ability and that males predominate in the highest ability end of the mathematical ability distribution. Hence the present study was conducted with this objective of studying the Gender Difference in Relation of Mathematical Creativity with Achievement in Mathematics among secondary school students.

Key Words: *Mathematical Creativity, Achievement in Mathematics, Gender difference, Competitive tests, etc.*

Introduction

Mathematics is considered as 'The Queen of all Sciences'. This subject plays a major role in determining the strength of any nation's work force. It is the only subject whose knowledge is needed for the whole life. It occupies a prominent place in our life. We are all attracted to Mathematics for its fine, scientific, cultural and even artistic qualities and 21st century Mathematics is permitting impressive marvel and scientific achievement. Mathematics is a difficult subject for most of the students. They are not interested to study Mathematics formulae, theorems, concepts etc. Most of them are coming to higher classes without having the basics in Mathematics. This makes them the subject more difficult. Mathematics is an important subject in school curriculum.

In India, the present status of girls Achievement in Mathematics is not low when compared to boys. But it is found that the pass percentage of boys in many of the competitive tests requiring mathematical ability are higher than that of girls. Gender Difference studies also give conflicting results with regard to Achievement in Mathematics.

* Associate Professor, NSS Traning College, Pandalam, Kerala. E-mail: malini_rajagopal@yahoo.com

The study of sex or gender differences cognitive abilities, personality in characteristics, academic achievement etc., became a major concern to the investigators in psychology and education by the development of methods to study this scientifically. The number of such investigations became innumerable during the latter half of the 19th and 20th centuries and hence volumes of literature exist on the details of such investigations. However, the quest for reliable evidence on gender difference still exist as current research only can establish whether beliefs and stereotypes about males and females have any validity in the present context. Not only that, the present emphasis indicates a desire to understand what implications sex differences have for female psychology and development. It is because of this, the investigator wished to study gender differences in Mathematics Achievement and other variables of the mathematics domain.

The work of Maccoby and Jacklin (1974) on the same theme concluded that sex differences are well established with three cognitive constructs viz., mathematical performance, verbal ability and spatial visualising ability and that the differences appear fairly consistently by early adolescence. Levenson, Esther (2011) conducted a study on Exploring Collective Mathematical Creativity in Elementary School. This study combines theories related to collective learning and theories related to mathematical creativity to investigate the notion of collective mathematical creativity in elementary school classrooms. Collective learning takes place when mathematical ideas and actions, initially stemming from an individual, are built upon and reworked

Even though there is such an observation with regard to mathematical performance, the position with regard to mathematical affective variables is not well studied. The present study is in this context.

Need and Significance

Investigator's experience as an educator of Mathematics made her think about gender differences in Achievement in Mathematics and some other variables in the mathematical domain. This was with the idea that if such differences exist between boys and girls, the curricular and non curricular experiences have to be adjusted to suit their differing requirements. The study of gender differences in mathematical variables assumes special importance in this context.

In the mathematical domain the present knowledge is that gender differences emerge in adolescence and appear to increase particularly on tests involving reasoning ability and that males predominate in the highest ability end of the mathematical ability distribution. The similarity in the performance of the majority of the population of tests of qualitative ability has been noted, suggesting that it is among the more gifted students the differences begin to emerge.

Even though there are studies of gender differences in creativity (Asha, 1980, Gakhar, 1985) - a special type of divergent ability studies are rarely available with regard to mathematical creativity, a quantitative divergent ability of the mathematical domain. This variable was therefore considered by the investigator as creativity is a composite of many variables and pupils of high creativity is the need of the hour.

Hypotheses

- 1. Significant Gender difference exists in the mean scores of Mathematical Creativity.
- 2. Mathematical Creativity among Secondary School Students is independent of Gender.
- 3. Significant Gender difference exists in the relationship of Mathematical Creativity with Achievement in Mathematics

Objectives

- 1. To test the Gender difference in the mean scores of Mathematical Creativity
- 2. To test the dependency of Mathematical Creativity on Gender among Secondary School Students
- 3. To test for Gender difference in the relation of the Mathematical Creativity with Achievement in Mathematics.

Methodology

Sample

Sample consists of 703 (consisting of 329 Boys and 374 Girls) Secondary

Table 1

Data and results of test of significance of difference between mean scores

	Mean	Standard Deviation	Ν	Critical ratio	Level of significance
Boys	42.69	16.48	329	3 65	0.01
Girls	38.52	13.76	374	5.05	0.01

The t value obtained is 3.65 which is greater than the table value at 0.01 level. This indicates that boys and girls differ in their mathematical creativity. The higher mean score obtained by boys indicate the superiority of them in the variable.

Gender as Independent of Mathematical Creativity

The data collected was analyzed to test whether gender in independent of mathematical creativity by using the chi square test of independence. The data was

School Students of Kerala. Stratified Sampling technique was used for the selection of the sample. Sample was drawn from 16 schools of 8 different districts of Kerala.

Tool

Test of Mathematical Creativity (Sumangala, 1993)

Statistical Techniques

- 1. Two tailed test of significance of difference between mean scores for large independent samples.
- 2. Chi Square test of independence
- 3. Test of significance of difference between correlations for large independent samples.

Analysis and Interpretation of Results

Gender difference in mean score of Mathematical Creativity

Gender difference was tested for significance by comparing the mean scores of Mathematical creativity of boys and girls. made in the form of 2×3 contingency table (gender mathematical creativity). The chi square value obtained is 6.369 and contingency coefficient is 0.095. The chi square ²) value is greater than the table value at 0.05 level. (5.991, df = 2). The C value obtained indicates low but significant relation between gender and mathematical creativity.

Relation of Mathematical Creativity with Achievement in Mathematics

(a) Boys

r = 0.559

fisher's t = 12.188 99 percent confidence interval of r (0.461 to 0.657) Shared variance = 31.24

The t-value exceeds the limit set up for significance at 0.01 level, which shows the existence of a true relationship between the variables mathematical creativity and achievement in mathematics .the size of r indicates that the relation is substantial. The 99 percent confidence interval of r suggests that the population r between the variables lie between the values 0.461 and 0.657. the percentage variance shared between the variables is nearly 31, which means that 31 percent of the variance of achievement in mathematics is attributable to the variation in mathematical creativity .

(b) Girls

r = 0.465

Fisher's test t = 10.122

99 percent confidence interval of r = (0.359 to 0.569)

Shared variance = 21.59

The correlation coefficient between the variables is 0.465 and the Fisher's t is, 10.122 which is significant beyond 0.01 level, indicating a true relationship Between the variables. The size of r indicates that the relation is substantial. The 99 percent confidence interval of r suggests that the population r lies between the values 0.359 and 0.569. the shared variance between the variables is 21.59, which means that 22 percent of the variable is 21.59, which means that 22 percent of the variable achievement in mathematics in attributable to the variation in mathematical creativity.

Gender Difference in the Relation of Mathematical Creativity with Achievement in Mathematics

The coefficients of correlation obtained for boys and girls were compared by using Fisher's "test of significance of difference between r's.

Table 2

Gender Difference in Relation of Mathematical Creativity with Achievement in Mathematics

Gender	R	"	Critical Ratio
Boys	0.56	0.63	1 581
Girls	0.46	0.51	1.501

Critical ratio obtained indicates that no significant gender difference exists in the relation of achievement in mathematics and mathematical creativity

The findings of the t test and chi square test indicates that significant gender difference exists in mathematical creativity. The nature of relation with achievement in mathematics is not different between boys and girls in the case of mathematical creativity.

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