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CONTENTS

EDITOR'S NOTE

It gives us great pleasure to inform our dear readers that the NCERT has completed 50 years of its journey in the field of school and teacher education in September 2011. The NCERT was founded in 1961 with an expectation to support and provide new directions to school and teacher education in the country corresponding with changing societal, national and international aspirations and demands. Setting its pace with time, the NCERT has emerged as an apex organisation in the country and pioneered an important space in the area of curriculum for school and teacher education, vocational education, educational technology, evaluation, educational surveys and research and also in the formulation of educational policies and schemes. As co-passengers of this journey you all were with us on many turnings and we acknowledge your contribution and collaboration whether directly or indirectly.

During golden jubilee year 2011 celebrations, the Council had conducted many such programmes which provided its faculty new dimensions for reflection and introspection about the role of the Council in emerging school and teacher education scenario. Here we find it essential to mention about Golden Jubilee Lecture Series in which five lectures were delivered by eminent scholars and personalities on various dimensions of education and were found very helpful for the whole Council to see education in new perspectives. Professor C. Vijayan in his lecture talked about strategies for effective science education in the present century and Professor Amitabh Mukherjee shared his experiences about unstructured learning in structured learning environment. Professor Madhav Gadgil' lecture was on 'Parisara– A Free Public Domain Knowledge Resource on Indian Environment Developed in a Collaborative Fashion'. Professor A.K.Sharma, NCERT's former Director, in his lecture, talked about fifty years of NCERT in the context of school, teacher and society. Dr. Karan Singh reiterated relevance of four pillars of education namely Learning to know, Learning to do, Learning to live together and Learning to be, as proposed by the Delor Commission report 1996 "Learning the Treasure Within" in the present context. These lectures are available in published form.

The present issue includes one of the Golden Jubilee lecture by Professor A. K. Sharma which emphasises on the role of NCERT since its inception and the concerns in respect of school, teacher and their impact on society. This issue also includes transcription of Dr Sam Pitroda's lecture (organised by Central Institute of Educational Technology, a constituent unit of NCERT as a part of golden jubilee celebrations) on "Open Educational Resources (OER) for School Education" which lays out the use of Information and Communication Technology (ICT) in education in real sense.

Besides, this issue includes articles of our contributors covering various aspects ranging from vocational education to science education. E. Arumuga Gandhi and Vineeta Sirohi in their articles highlight that vocational education is intricately linked with social, economic, technical, and political parameters. Vishal Sood and Arti Anand in their article analyse teacher's perception regarding social aspects of inclusive education. A research article contributed by Narendra Kumar and Rajive Kumar reveals interesting findings about the psychological stress among male and female science students. Lalit Kumar and Priyanka Singh talk about the attitude of students towards mathematics as correlate to achievement in mathematics, whereas an article by Ramesh Dhar Dwivedi examines classroom climate and parental awareness in the context of academic achievement of secondary school students. Rajendra Kumar Nayak and H.K. Senapaty in their article evaluate constructivist approach as an effective strategy in teaching students. D. Eliyas in his research article 'Error Analysis of English Language: A Study of Mara Students of Class-x' explores English learning of students belonging to tribal community of Mizoram.

Procrastination may result in stress, sense of guilt and loss of personal productivity. Radhakanta Gartia, Sushama Sharma and Ramana Sood in their article investigate the relationship between procrastination and academic anxiety in undergraduate students.

Geographic information system (GIS) technology is being used for scientific investigations, resource management, and development planning. Aparna Pandey in her article highlights the importance of GIS in geography education.

The issue also includes an article by Raghvendra Krishna Pratap about Paulo Freire's thoughts on adult education. We conclude this issue with a book review by M. Siraj Anwar on Some Aspects of Islamic Studies.

Continuing this journey with our readers and contributors we look forward to our readers' feedback on this issue.

Academic Editor
JIE

School, Teacher and Society*

A.K. Sharma**

Abstract

The lecture, being a part of the celebrations of the Golden Jubilee of the NCERT, presents a synoptic view of its notable contributions and leadership role it has played in the field of school education. It brings out that during the 50 years of the NCERT, it has been increasingly noticed for its 'good work' and achievements as well as for its inability to perform to expectations by the States, the school community and the public. The expectations from the NCERT's role in school education constitute not only the dream image of NCERT but also its sub-conscious will. The lecture has been titled 'School, Teacher and Society' and dwells upon the symbiotic relationship of these three entities in the life of a nation. School education defines the trajectory of the young from the formative years of their growth and development to their entry into professional engagements with life. The concerns of access, equity and quality and the various ramifications of these concerns have been discussed in the context of the instrumentality of the school system to possibly minimize social inequities. The role of secondary education to produce skilled workforce for local and global requirements, for increasing GER in higher education, for increasing the productivity of both the individuals and the homes and improving the economy of the country are discussed. Quality of secondary education is dependent on the quality of the content offered at this stage of education, the manner in which transacted and evaluated, and the competencies of the teachers to communicate the same to the learners. Vocational education has not seen success as a part of secondary school education. The situation will remain static if some drastically different thinking is not done in this connection. The role of open and distance learning in enhancing the outreach of the secondary education is also discussed as a complementary alternative. Equally important are concerns of the challenges school education poses for the education of the socially deprived sections of the societies, gender disparities and curricular challenges for the physically and mentally challenged. The new responsibilities of the Boards of School Education in the context of public examinations being phased out are an issue for detailed debate. How the Guru ideal and the implications of preparing a professional teacher need to be harmonised calls for a drastic re-look at the whole modality of teacher preparation. A critical progressive ethics for teachers is oriented toward bringing out the best in all students, instead of focussing on what they are doing wrong. Rather than working from a disciplinary position, teachers generate democratic practices, whereby students and teachers collectively construct an ethical modus operandi or modus vivendi. In this humanistic vision, a genuine learning community can flourish as opposed to the market model where standards and competitiveness pit human beings against each other. A drastic overhaul of teacher education requires a serious effort and need to be initiated sooner than later. The triangular implications of School, Teacher and Society provide the framework of the various issues presented in the lecture.

* This lecture was delivered for the Golden Jubilee Lecture Series at Chacha Nehru Bahwan CIET, NCERT, Published by NCERT, New Delhi.

** *Professor and former Director*, NCERT, New Delhi 110016

I am grateful to the National Council of Educational Research and Training (NCERT) for inviting me to deliver a lecture in the NCERT Golden Jubilee Lecture Series 2011, organised as a part of Golden Jubilee Celebration of the organisation. I understand that this is the third lecture in the series. I accepted this invitation in all humility as I am conscious that I am only a practitioner in the field of education and not a scholar by any standards. Perhaps, the motivation for this invitation was that I was a member of the NCERT family for almost 25 years of my career. All thoughts in this lecture are, therefore, leaning on my experience and understanding, though limited, of the state of education in general and school education in particular, in our country's context. The centrality of the lecture is the role of the NCERT as it has evolved since its inception and the concerns it has addressed in respect of school and teacher, and their impact on society.

Fifty years in the life of NCERT is a momentous time for taking stock of its achievements and the policy initiatives recommended by it for the improvement of the quality of school education. This should, therefore, be a time for introspection. While such an exercise would definitely provide a sense of pride to those who have been associated with this organisation for the contributions it has made in the past, it will also give an opportunity to reflect on its deficits which could be converted into challenges and opportunities for the future.

NCERT: Past, Present and Future

On an occasion like this, therefore, it is difficult to resist some reminiscences. NCERT is essentially an academic body of professionals in the field of education, researchers and teachers. The characteristics of its function are 'service', 'advice and assistance', and 'extension' and this has been mandated in its Memorandum of Association (MoA). NCERT does not carry the clout of executive power of a government department, neither it is a grant disbursing agency. It is widely recognised as a national institution playing a leadership role in the field of school education. The birth of NCERT and its role during the 50 years of its existence has to be seen in this background.

NCERT grew and evolved in the midst of a multitude of developments post 1960s, both in experience and expertise. It made notable contributions in many areas concerning education and also found itself at times not sufficiently prepared and sometimes even inadequately equipped. It cannot, however, be denied that during all these years, NCERT has been increasingly noticed for its 'good work' and achievements as well as for its inability to match the expectations by the states, the school community and the public. This is a pointer to the high expectation of the leadership role of NCERT in bringing about significant improvements in the sphere of school education and these expectations constitute not only the dream image of NCERT but also its subconscious will. Such an image has emerged as a result of years of assiduous and dedicated efforts of its academic community for which all those responsible are entitled to a legitimate pride.

The monumental work done by the NCERT during its first decade on the Health Education Work (HEW) related

projects established its credentials as a premier research organisation in the field of school education. Developmental norms of children from 2-1/2 to 6 years sowed the seeds for subsequent work on pre-school education, which for the first time found its reference in the National Policy on Education (NPE), 1986 in the form of Early Childhood Care and Education (ECCE) and now in the amended Article 45 of the Constitution. The focus on Children's Media Laboratory (CML) and the developmental focus on pre-school education find its acceptance in today's thinking of treating ECCE as Early Childhood Care and Development (ECCD).

NCERT has been at the forefront of initiating implementation of recommendations of the Commissions on Education set up by the Government of India. The Report of the Secondary Education Commission (1952-53) saw the birth of the Regional Colleges of Education (RCEs) to experiment with the Multipurpose Higher Secondary Education in the Demonstration Multipurpose Schools attached to the RCEs, and the first ever attempt at the development of integrated programmes of teacher education in general and Technology, Agriculture, Commerce, Home Science and Fine Arts related vocational areas in particular. But for a myopic vision on some planners, NCERT would have been a pioneer in laying a solid vision of vocational education.

The implementation of the key recommendations of the Education Commission (1964-66) saw the development of the first Curriculum Frameworks namely — Curriculum for the Ten-Year School (1975), Higher Secondary Education and its Vocationalisation (1976), followed by a classic Teacher Education Curriculum – A Framework, brought out by the non-statutory National Council for Teacher Education (NCTE) then an integral part of NCERT. These historic documents provided major policy reforms in curriculum and became the lifeline of all subsequent attempts in the curriculum frameworks brought out in 1988, 2000, 2005, for school education, and Quality Teacher Education Framework (1998) and the National Curricular Framework for Teacher Education (2009) by the Statutory NCTE.

NCERT's pioneering work on talent search, launched in 1965, was the first attempt in the country visualising the need for identification of talented young who would pursue basic sciences and mathematics to create foundational edifice for developments in engineering and technology. The format of the Science Talent Search examination became a progenitor of the current format of competitive examinations for entry into professional courses.

The first ever attempt at the use of technology into teaching-learning process can be attributed to the Satellite Instructional Television Experiment (SITE) in the early 1970s and the role played by the Centre of Educational Technology (CET) of the NCERT in determining its content and process. This role ultimately led to the creation of the Central Institute of Educational Technology (CIET).

NCERT can also be credited to be the first organisation to make available to education system a database for policy formulation through institutionalisation

of census-based quintennial All India Education Surveys (AIESs). The data base generated at the behest of the Planning Commission has now taken us to 8th AIES which is currently on.

The NPE, 1986 had recommended a complete overhaul of teacher education, one of the inputs of which was the development of a scheme of restructuring and reorganising teacher education. The conceptual documents on the District Institutes of Education and Training (DIETs), Colleges of Teacher Education (CTEs) / Institutes of Advanced Studies in Education (IASEs) were developed by the NCERT and NIEPA.

The NCERT's involvement in the development of textbooks for different curricular areas of the entire school education from classes I to XII is well known. It has won accolades for the quality of the content and the orientation built-in for pedagogy in these textbooks. Documenting the whole technology of text book development which has given to NCERT a great name needs to be properly documented in terms of the processes so that a nation wide capability is developed in each state to design similar quality materials based on their local context and involving local expertise.

The above citation is only some of the significant firsts to the credit of the NCERT.

The multifarious roles of significance to education underscore the need for NCERT to develop and sustain a capability to think ahead, to peep into future. It should not remain satisfied with or overwhelmingly preoccupied with looking into the past and also with attempting analysis and solution of the complex and numerous problems of the contemporary education scene only. It has to continue to develop capabilities to rejuvenate its role as a national 'think tank' in the area of school education as it is this role which can be the basis for its being able to 'advise and assist' the central and state governments in policy and programmes formulation. NCERT should ever remain conscious to develop with increased vigour the culture and capability to promote and organise purposeful debates and discussions in a professional way about the problems, concerns, issues, etc. which afflict and hamper sound educational development. It must also keep in its active memory that it has also a role to help the states build them into authentic academically sound research-oriented institutions as this would shorten the gestation time for proper growth of the state-level institutions. Introspection by NCERT, therefore, is necessary at this juncture to be sure whether the organisation's efforts have been in the right sense and direction, and to apply mid-course connections, if the situation so demands. However, some items of work have been undertaken by or entrusted to NCERT which did not strictly flow from its training and research function, and over the years these have tended to claim a disproportionate share of its time and energy, without contributing to the enrichment of the professional content of NCERT's basic work. The educational scenario globally is undergoing transformational changes and India is not an exception to these experiences. In order that NCERT remains alert and equipped to perform its roles in the changing dynamics of school education, it cannot remain static in its approach

to the development and solution of the problems.

Before I proceed further, I am venturing to cite some of the areas which may be relevant for a possible futuristic concerns of NCERT.

(i) The MoA of the NCERT states ... "to assist and advise the Ministry ... in the implementation of its policies and programmes in the field of education, particularly school education". NCERT should have a role not only in the implementation but also formulation of the policies and programmes and its advice should be available to the Central and State Governments. This can bring out sharply the leadership and pace setting role of the NCERT and enhance the focus of its programmes so that policy formulation initiatives are well grounded in the planning of its work strategy.

(ii) NCERT is an overarching name for a composite of institutions which comprise eight constituents, namely National Institute of Education (NIE), New Delhi, Regional Institutes of Education (RIEs) at Ajmer, Bhopal, Bhubaneswar, Mysore and Shillong; Central Institute of Educational Technology (CIET), New Delhi, and Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), Bhopal (and earlier even Field Advisers' Offices). NIE and NCERT have become synonymous. While each constituent of NCERT is independently headed by a professional, who heads NIE? NCERT should be an administrative and policy generating secretariat with a unique identity for each constituent. Isolation of the constituents from mainstreaming with the NCERT need to be bridged.

(iii) A system of internal deputations to the extent possible and feasible to NCERT's constituents/ departments, could be evolved as it could enhance the holistic development of faculty resources to provide a wide range of expertise on issues in education.

(iv) Academic designations in NCERT have to be specific to the areas of expertise required; the present situation could be relooked to bring it in consonance with the character of its Research and Development (R&D), Training and extension function.

(v) The date line of the All India Education Surveys should synchronise with the Five Year Plan formulation and its data should be available to the Planning Commission. The use of technology could bring about a change in this exercise of generating data base for planning and making it available for timely use.

(vi) Talent search must have specificity of its domains and mechanism, and nurturance of talent (in fact, nurturance dimension of talent leave much to be desired). Also we have surrendered to an apparently unexplained logic detriment to the original focus of the science talent search. Perhaps we need to specify other contours of talent hunt in other areas as well and design instruments of identification and nurturance.

(vii) Curriculum development in today's context can be immensely enriched with pedagogical advantage which technology offers. NCERT need to bring a greater synergy between educational and pedagogical work with curriculum practices. This area can lead to a near transformation of pedagogical practices in school education. In this context the role of CIET needs to be highlighted. While production of educational programmes for television and radio can be taken up by it independently, in respect of other audio-visual materials that it develops / produces, the principal objective should be to enrich and support the activities of the NCERT and provide a digital orientation to its various inputs in the field of school education.

(viii) The lack of offering teaching programmes at the NIE programmes, not necessarily leading to award of degrees could in the long run become brand names for NCERT's contribution to school education.

School Education Scenario

It is relevant at this stage to take a bird's eye view of the school education scenario in the light of future concerns of NCERT. School education defines the trajectory of the young from the formative years of their growth and development to their entry into professional life in the respective chosen areas of their engagement with life. School takes into account the various dimensions of the human individual to be nurtured and sustained through the content and the process of education as these are the foundations for all subsequent outcomes in the life of an individual. The question of availability of schools to fulfill demand; equal opportunities for all sections of the society to participate in education; and provisions of suitable infrastructure, trained teachers and effective pedagogy in schools, aimed at delivering the desired outcomes are among the concerns which any education system must address. NCERT is looked up to how the issues of access, equity and quality can be properly tackled in practical terms through undertaking research and studies to be closer to understanding the ground realities of the system. NCERT is a unique organisation in having to address the educational concerns of the child in all dimensions of his/her growth and development.

There are other concerns as well. School education in India is characterised by considerable discrimination. Children of the rich and the elite have access to 'good' quality, private and special types of 'public' schools, whereas the children of the vast majority of the poor, including the minorities and marginalised groups, go to government schools, a majority of which are perceived to be of indifferent quality. I do not subscribe to the so-called 'quality' of education offered in the public schools as this aspect needs to be studied scientifically, but the popular public perception as stated persists. Thus the class division in the society is reflected in the division of the school system. The later has been a major contributory factor to the perpetuation and accentuation of social inequality and is an important concern for school education to be taken note of in any impending educational reforms.

Another related systemic concern which afflicts school education in India is the transformation of the very nature and meaning of school education brought about by the forces of globalisation and liberalisation. The philosophy operating with 'international', 'global', 'world' schools does call for some study and NCERT could generate a discourse on such issues.

The differential between the 'haves' and 'have-nots' should be bridged in as much as the schooling facilities are concerned. Realising the social benefits of the harmonious growth of any society, school education should be based on the foundations of inclusion. Educational exclusion leads to exclusion from livelihood, knowledge, status in society, human dignity, etc. and is cumulative from generation to generation. This is a denial of human rights under Article 21A of the Constitution of India. The phenomenon calls for studies and NCERT could be in the forefront of leading such a discourse. There are two kinds of exclusion prevalent in our schools. The first and the more insidious pattern of exclusion is the social exclusion of children who come from socially and economically deprived backgrounds, namely, scheduled castes (SC), scheduled tribes (ST), minorities, and other communities, girls and children with diverse learning needs. The second is the exclusion of the children with disabilities of different kinds. Inclusive education is the imperative for the nurturance of an egalitarian society we stand for and refers to a philosophical position as well as an arrangement of institutional facilities and processes. The attempts in this direction, though not as forceful as they ought to be, have been incorporated in the legislation on the Right of Children to Free and Compulsory Education (RTE) Act, 2009 and is a welcome initiative.

This RTE Act serves as a building block to ensure that every child has his/her right to get quality elementary education honoured. The state, teachers, families and communities have to fulfill this entitlement together. Few countries of the world have such a national provision to ensure both free and child-friendly education to all children in developing to their fullest potential as possible. The gains in India's education system over the past few decades have been tremendous in increasing childrens', and especially girls' access to school. Yet, inequities persist for many children with an estimated eight million more not completing the full cycle of elementary education. In addition, learning assessments also show that more investments are required to meet the provisions of quality and child-friendly education for the estimated 190 million girls and boys in India who should be in elementary school today. The RTE Act provides a solid platform to reach the unreached with specific provisions for disadvantaged groups such as child labourers, migrant children, children with special needs, or those who suffer disadvantage owing to social, cultural, economic, geographical, linguistic, gender or such other factors. It also strives for participatory school management to ensure quality with equity, for example, by banning corporal punishment to ensure classrooms free of fear and anxiety as well as providing mother tongue instruction, as far as practicable. NCERT has a pile of agenda to convert the issues and concerns

expressed above into a format of studies and research. It is also important to mention that starting a 6 year old may be too late to lay the foundation to be ready for school, so investing in early learning is a key strategy in meeting the goals. In addition, there are millions of out-of-school children to be brought into classes at age-appropriate level with a support to stay in the school. This alone is posing a major challenge necessitating flexible and innovative approaches to provide education. Building on the achievements of the Sarva Shiksha Abhiyan (SSA) and its harmonisation with the RTE Act has to be made a reality in schools across the country. India thus has to emerge as a global leader in achieving the Millennium Development Goals (MDG) of ensuring universal elementary education of all children by 2015. Task is easier said than accomplished, and NCERT has an agenda for further discourse on this subject.

Definition (Age) of the Child and Right to Education

There has been a concern expressed by educationists and civil society that the RTE Act has not done full justice to the age range which defines a child. The definition (age) of the child was decided by confining the Act to Article 21A of the Constitution of India. The government's decision to do so has obviously got parliamentary approval with this Act. The original Article 45 and the Unikrishnan verdict, both include the age group 0-6 years. The Juvenile Justice Act defines a child upto age 18 years. The United Nations Convention on the Rights of the Child (UNCRC), to which India is a signatory, also defines a child from 0-18 years. In principle, by referring to the Juvenile Justice Act, the UNCRC and Article 21 (Right to Life) in the aims and objects of the RTE Act, the age could have been defined from 0-18 years. However, citing economic compulsions, the present Act has been confined to age 6-14 years as contained in Article 21A. A great deal of public pressure would need to be kept up in order to have the Act amended to incorporate 0-18 years as the age of the child. If and when this happens, not only ECCE but also secondary (which includes higher secondary) would be covered towards Universal Secondary Education (USE) as a part of Right to Education.

Towards Universal Secondary Education

The successful implementation of the RTE Act and the SSA has implications for secondary education in terms of access, equity and quality. At present only 50% children qualify for admission to class IX. The situation has to be tackled in the hopeful realisation when 100% children qualify. The concept of general education has also to be viewed afresh. Should the content of general education remain confined upto class X or extended to class XII. Globally, school education is of 12 years' duration. Extending the right of children to 12 years of education will require consideration whether it should be free as well as compulsory. To begin with, it could be free. Can the type of provisions contained in the RTE Act be equally valid for extending it to 12 years of education? What existing provisions will remain valid, what new may have to be added, and so on? NCERT can provide a framework for a futuristic legislation on the subject.

Unlike elementary education, secondary education was not part of the Universal Declaration of Human Rights (UDHR). World Education Report 2000 contains that during drafting the human rights declaration, education above elementary education was referred to as higher education. The first reference to secondary education can be found in the United Nations Convention against Discrimination in Education – "The State parties (undertake to) make secondary education in its different forms generally available and accessible to all. The UNCRC includes general and vocational education as well. These statements are clear indication of global policy shift in case of universal access to secondary education.

The Government of India has spelt out the broad objectives of secondary education as envisioned under the Rashtriya Madhyamik Shiksha Abhiyan (RMSA) in terms of providing a secondary school within a reasonable distance of any habitation which should be 5 km for a secondary school and 7-10 km for a higher secondary school; ensuring universal access to secondary education and universal retention by 2020, and providing access to secondary education with special reference to economically weaker sections of the society, the educationally backward girls and the disabled children residing in rural areas and other marginalised categories like SC,ST, OBCs and educationally backward minorities (EBMs). Thus though there is no legislation for making secondary education universal, the directions to achieve the goal have been demarcated.

The conventional argument that making universal 12 years', education is beset with its own problems when universal 8 years of education has remained an elusive dream for more than six decades after independence has to be tackled. It must be understood that it is a necessary utopia and we must chanallise our national energy and resources to respond to the challenge rather than whine away and put the nation at risk. No country including India is any more an isolated geographical spot; each one is woven into a pattern that is global. It is no more a choice to be globally competitive; it is a necessity that can be ignored only at the cost of the nation's peril. Global competitiveness in product, service, business and governance can be met only with globally competitive human resource, and secondary education is the foundation for these goals. Issues need to be brought to the surface and NCERT's potential to do that is unquestioned.

Besides the pressure of globalisation, universal excess to secondary education has also to be an obligation of the state. Education is a social aspiration; it is seen and perceived as the gateway to good quality of life. Such popular perceptions and aspirations are strongly supported by empirical evidences of direct linkage between the indicators of quality of life and education. The human development index stands testimony to this. The earlier perception of social aspiration about education is taking a new turn. When poor and relatively low educated parents continue to aspire for some education of their children, the educated middle class aspire for quality education. The proliferation of high fee paid secondary education in the private sector is an indication of the preference for 'better'

quality education and this has to be examined with reference to the quality of education offered in the government schools, and ways and means understood to make the needed correctives.

Achieving universal secondary education through formal and alternative modes of education is a target which India has to strive to achieve by 2020. For this to be achieved, it is assumed that UEE would be achieved, by 2012. It also assumes that internal efficiency of the school education would be increased by 100 per cent and there would be no failure and repetition by 2012 or so. It is only then that the enrolment size would correspond to actual population in the corresponding age group. This framework for achieving Universal Secondary Education (USE) is consistent with SSA strategy of the Government of India. The gap of 8 years between UEE and USE is to provide for (a) capacity creation at secondary stage – the present capacity for secondary education is not only inadequate but is of poor quality and is characterised by vast differentials in access in different regions of the country, (b) to allow for somewhat higher population growth than anticipated in the available statistical data, and (c) to provide for some slippage in the achievement of UEE. Various studies indicate that a possible scenario for achieving UEE in India would be around 2016.

The Government of India now proposes to invest more (₹ 52,000 crore) on Secondary Education under RMSA. It has also proposed to set up 6,000 Model schools. Of them, 3,500 Model schools would be set up on the pattern of Kendriya Vidyalayas (KVs) and 2,500 schools would be set up in Public Private Partnership (PPP) mode. Education Cess has been increased to 3 per cent to cover secondary and higher education. For the expansion of secondary education, we will have to increase the transition rates at elementary stage and at the same time ensure easy access to secondary education in a nearby place. Besides, we will have to provide quality secondary schooling at an affordable cost. We need to strengthen the existing institutions and also to set up newer institutions for the expansion of secondary education. Unlike elementary education, where we have 1:40 teacher pupil ratio, we will require a large number of specialised teachers. At times, we may have to have a teacher only on 10 students.

School Education: Curricular Aspects

Is there a scope for breaking the rigidity of the present inclusion of curriculum areas? Why not focus on fixing the learning outcomes and draw the content for these from across the curriculum areas. Could the focus of all curricular areas be on developing a spirit of inquiry, courage to question, creativity, objectivity, problem solving skills, decision making skills, and aesthetic sensibility through the content which defines a particular area. It is in this context semesterisation needs to take a more practical meaning, and not just conducting two examinations in a year.

There is also some asymmetry in curricular options by the students. Enrolments in science and mathematics are falling and in social sciences and humanities rising. Such an asymmetry has implications for higher education both in general and in specific areas in particular. If this asymmetry is not

properly rectified at the secondary and higher secondary stages, the status of higher education may feel its implications adversely.

Secondary education actually includes education from classes IX to XII but for the sake of convenience a sub-sector of this stage is named as higher secondary which includes classes XI and XII. Higher secondary education is a crucial and terminal stage of school system. It is a gateway for higher education and also a vital link to the world of work. While the developed world has reached a stage where 12 years of school education has become universal, it is undergoing a transformation in the developing countries, including India. The greatest pressure in the coming years will be to redefine the role of higher secondary education consistent with the long term social and economic strategy of the country. Diversification of education into academic and vocational streams characterises this stage of education. The two streams have very different character and the nature of inputs for running them are different in scope and management. NCERT has brought out a Report of a Focus Group on Work and Education but I am constrained to mention that its implications for curriculum have not been properly elaborated.

School Curriculum: Transactional Modalities

Quality of secondary education is, of course, dependent on the quality of the content which is offered at this stage of education, the manner in which it is transacted, and the competencies of the teachers to communicate the same to learners. The National Curriculum Framework (NCF) 2005 has advocated constructivism as a major paradigm for learning which means that learners actively construct their own knowledge by connecting new ideas to existing ideas on the basis of materials/activities presented to them as experience in individual as well as collaborative situations. Active engagements involve enquiry, exploration, questioning, debates, applications and reflection. Lest these concerns should remain rhetoric, NCERT needs to go all out to work out pedagogic interventions in teaching-learning for internalisation and appreciation of the idea by both the students and the teachers. The constructivist paradigm is a welcome feature in many ways as it:

- Puts the learner, the child, at the centre of the educational process,
- Departs from extremely fixed reductionistic norms of learning,
- Emphasises activities/experiments as one of the important ways to facilitate construction of knowledge by children,
- Respects, (not to be equated to accepts) children's knowledge concepts even if they differ from standard concepts of various disciplines,
- Views teacher not as a transmitter but as a facilitator for knowledge.... of the child, and finally
- Aims to build up concepts (atleast partly) through local contextualised knowledge.

There has been much debate on 'local' versus 'global' or standard knowledge. If local knowledge is intended to mean

knowledge in the context of the learner's environment (for example, knowledge of learners in tribal communities about plants) or local technological skills and practices, there is really no issue. If, however, it is supposed to include all manner of local beliefs and myths it can indeed be problematic. Also, constructivism can mean different things to different people. The current debate probably views it as a pedagogic paradigm and that is how it should be looked at. In particular, it should not be equated to relativitism which means that knowledge is basically a social construct, there is no absolute criterion by which to judge which one is 'better' or 'truer'.

Aspects related to school education curriculum and evaluation have now become a part of law for the elementary stage of education in the RTE Act. The provisions of Section 29(2) of the RTE Act, although are equally valid for all stages of school education, namely,

- Conformity with the values enshrined in the Constitution,
- All round development of the child,
- Building up child's knowledge, potentiality and talent,
- Development of physical and mental abilities to the fullest extent,
- Learning through activities, discovery and exploration in a child-friendly and child-centered manner,
- Making the child free of fear, trauma and anxiety and helping the child to express views freely,
- Comprehensive and continuous evaluation of child's understanding of knowledge and his or her ability to apply the same.

As a part of Fundamental Right of the child, how will the above provisions be made justiciable. Although the extent of 'violation' of the provisions may not be possible to be correctly pinpointed, there will be a constant reminder to the teacher and the school that no effort has to be spared to be guided by the implications of the provisions and there has to be constant endeavour to reach the intended goals. A challenge indeed for the NCERT to develop inputs in regard to the above provisions.

Curricular Challenges for the Physically and Mentally Challenged

The National Sample Survey Organisation (NSSO) projected a population of 9.66 crore children at the secondary and senior secondary levels whereas only 2.70 crore of them were reported to be enrolled (1997-98). This coverage is approximately 25 per cent of the potential population. This low coverage in general education is a serious concern when the country is attempting to transform the population explosion as human resources. In addition to low coverage, dropout of children at the secondary level is also a big wastage in the educational sector. When the meager coverage and high dropout rate are impediments for the growth of general education itself, the field of special education faces further deprivation. In this connection some of the vital factors which require attention include making inclusion as a mass movement of general education; designing curricular adaptations imperative in school education; development of instructional strategy for persons with disabilities; improving affordability of education for children with disability as it is certainly costlier than that of education of non-

disabled children; providing accessible environment as presently institutions which have successfully done so are only a handful in the country; application of information technology

Learner Evaluation: Focus on Continuous and Comprehensive Evaluation

While talking about school education, it is not possible to stay away from reference to Boards of School (Secondary) Education which are the examining and certifying bodies of the pass-outs of secondary education. The NPE (1986) made a strong plea for evaluation reform and indicated the need for development of an evaluation framework. In its Programme of Action (PoA), it made recommendations like gradual phasing out of public examinations, to begin with secondary level examination. It de-emphasised rote learning, focused on continuous and comprehensive evaluation and introduction of semester system, including grading, etc. These provisions have been incorporated into a law, the RTE Act, 2009 vide Section 29 (2) of this Act. Since we cannot make even an intelligent guess when the existing Act will be amended to include the age group from 0–18 years thereby extending its applicability upto secondary education, we have to work out a strategy to accelerate the examination reform process through a mechanism of professional interventions.

There is a general mis-conception that if the responsibility of conducting examinations and certification is relegated to the teacher and the school, there may be fall in standards and reduction of instruction time by the teacher and so on. This does not seem to be a valid argument. One of the cardinal principles is that a teacher who is qualified to teach has all the credentials to evaluate and recommend the certification by the institution where the child is studying. This obviously calls for a greater amount of responsibility and accountability on the part of the teacher and this need not be sided away any longer. Perhaps this has the germ of improving the inter-school quality to be judged in the performance of the students in entrance examinations for admission to higher and professional education.

A related question that has often been raised is that what could be the new responsibilities of the Boards of School (secondary) Education if the conduct of public examinations does not remain their concern. Two suggestions come to my mind and they could be examined by experts for their feasibility, namely, the Boards could focus on designing instruments and strategies for monitoring performance of the schools under their affiliation/ jurisdiction; could involve in improving the quality of education through capacity building programme of teacher development; could undertake the task of reviewing quality of textbooks and other instructional materials used in the schools across the country; could be involved in undertaking the conduct of normative examinations for those interested to enter higher professional and technical education institutions.

Secondary Education vis-à-vis Vocational Education

Secondary education would not be complete if vocational education is not

appraised as a part of the formal school. The formal school is most geared for academic education. The profile of its faculty and the head of the administration of the school are not equipped with the philosophy that goes with offering vocational programmes. It would require a transformation of the concept of the formal schooling if vocational education has to fit into the existing structure of thought and action in regard to this area. Some key concerns which have affected the success of this programme in the formal school include the following:

- Vocational education is treated as inferior to academic education
- There is lack of vocational infrastructure for the variety of vocational offerings that are possible in the context of developing knowledge economy
- There is virtual absence of teaching learning material in any regional language, thus creating a very serious handicap for the students of the vocational courses
- There is absolutely no worthwhile programme of preparing vocational teachers. The traditional Colleges of Education are perhaps not equipped both in terms of infrastructure and physical and human resources to offer programmes in vocational teacher preparation. A design will have to be worked out in consultation with professional institutional dealing with engineering and technology, agriculture, health and para medical to undertake the responsibility of not only designing but also offering such courses
- Rigidity of classifying all vocational programmes to the duration of 2 years at +2 stage to enable certification by the Boards of School (Secondary) Education needs to be broken.

It is felt that unless these issues are critically examined and decisions taken for correcting the situation, the vocational programmes will not flourish as a part of the formal school system. The situation will remain static if some drastically different rethinking is not done to address this priority area of higher secondary education.

Open Distance Learning in the Context of School Education

Although the pressures from UEE would impinge upon the formal school, there would still be a large segment of secondary age appropriate population who may not be able to derive the benefit of the formal school. The modality of Open and Distance Learning (ODL) reinforces the need and aspirations of those persons who aspire to enhance their academic and professional qualifications. The RTE Act mandates that all children are to be covered for the first 8 years of education only through a formal school. The ODL modality, therefore, acquires significance for secondary and higher secondary classes. This will have to supplement the formal school to reach the unreached. We need to move towards a stage when the boundaries between formal and ODL modalities will diffuse and supplement each other. It also will require to nurture a symbiotic relationship with semester system and transfer of credits between formal and ODL systems. It must be

emphasised that it will be injustice both to formal and distance education if all inputs which make distance learning substantive and operative, integrating effectively the use of information and communication technology is not effectively utilised to provide inputs into the process of curriculum development, teaching, training and learning.

The 'Guru' or the Professional Teacher (?)

The success of education depends essentially on the quality of the delivery system and a very serious attention is required to be paid in this direction. Amongst many things which form a part of this segment, the teacher is the most critical factor in achieving the goals of education. We have eulogised in our country the role of the teacher and not infrequently nostalgical references are made to the Guru ideal in any discussion on the subject in our national context. How relevant is the Guru concept in the context of democratic secular education? Is the professional teacher concept lacking in any way from the Guru of the ancient yore. Can the two be combined and a synthesis worked out?

One could dismiss straight away the revival of Guru as dreamy, mystical and archaic. The Guru was the institutional answer for a particular socio-philosophic context characterised essentially by an oral tradition in education, non-availability of any other sources of education than the human teacher, and restriction of education to a chosen elite. Ours, on the other hand, is an age guided by the ideals of equality of educational opportunities and life-long learning with the help of multiplicity of learning resources which technology has made available. One could also point a finger at the kind of education the Guru was concerned with, spiritual wisdom. Education was transmission of such knowledge as would help the individual attain spiritual satisfaction and perfection. It had the backing of an epistemology whose important tenet was that spiritual truths are not realised through the study of books or independent reflection but are the outcome of inherited wisdom handed down from divinely inspired teachers. The Guru was needed under such a system of beliefs as a spiritual preceptor, a deity incarnates without whose grace, and salvation was out of question. These are criticisms whose force can in no way be denied, yet to brashly dismiss the guru ideal as irrelevant to the times and as theological would amount to exhibiting a philatelic insensitivity to the very subtle aesthetic qualities composing the ideal.

The above preamble has a direct concern with our thought in regard to the modalities of teacher preparation in the current context. We know that the 'Guru' was totally dedicated to the transmission of knowledge, a scholar and a person of unimpeachable character and who served the society not for the sake of material gain but for the cause of knowledge. In teaching the student he sought his own spiritual development.

Another lesson on the Guru institution is that respect and status are not something that are added to the teacher by the grace of the community but something that are warranted and earned by the worth of the teacher himself. Such worth in modern times

comes from a sincere and dedicated effort to develop the professional skills and competencies that are required for efficient functioning as a teacher. Every teacher is expected to strive to make himself/herself better both as a person and as a professional whatever be his/her initial circumstances that drew him into teaching. The Guru ideal, therefore, may appear archaic in its outer form; in its essential spirit has the following messages for us as teachers, namely: to constantly strive both as a person and as a teacher; to have a commitment to the growth of the students; to have a commitment to learning and to have a concern for the society.

These are universal principles which time or space does not pale and we as teachers would do well to constantly remind ourselves of them. And this presents a very big challenge for transformation and revitalisation of the present modes in which teacher education is being offered. There is a serious concern to revisit the present teacher education to prepare a person who can come close to the ideal of a teacher mentioned above.

Towards professional preparation of teachers a few pertinent concerns will need to be discussed. Is there a need for focusing on teacher education for preparation of teachers who have a holistic understanding of all stages of school education with possible specialisation of any particular stage? In order to accord status to teacher education, should not preparation of teachers for all stages from early childhood to higher secondary be done under the umbrella of the university system, as was recommended by the Education Commission of 1964 66 but which has not received attention so far? Is higher secondary stage to be treated as a distinct stage for teacher preparation or can be subsumed in a general B.Ed. programme? Should the system take a conscious decision of integrating subject matter and pedagogy and offer integrated models of teacher education? Is it educationally a correct premise that teaching in lower classes can be managed by teachers with lower academic qualifications? What mechanisms could be understood for adherence to a code of professional ethics for teachers? These are amongst several questions which should lead to serious review of the most important factor for quality of school education and the quality of the delivering system namely the teacher.

In Conclusion

Friends, I have made some reflections on school education and teacher education within the constraints of my limited experience. I have touched upon several issues which may require in-house deliberations in the NCERT in carrying their meaning forward. This may give some agenda for reflection of a more serious nature. The cumulative output of 50 years of NCERT's contribution to school education and teacher education should provide the needed stimulus to move ahead. I take this opportunity of wishing the fraternity of NCERT all success and congratulate all those who had the opportunity to serve it. The potential of NCERT is inherent in its original design but if it requires additions, modifications to that design, based on a learned discourse, the Jubilee Year can be a momentous sign post.

Open Educational Resources (OER) for School Education

SAM PITRODA*

As celebration of NCERT Golden Jubilee Year, Educational Technology Lecture Series 2010-11, Central Institute of Educational Technology, NCERT organised an inaugural lecture on Open Educational Resources (OER) for School Education which was delivered by Padma Bhushan Dr. Sam Pitroda. The lecture was organised at CIET, NCERT, New Delhi on 29 March 2011. About 250 academics from various organisations, principals and teachers of neighbouring schools of Delhi participated in the programme. The programme was also simulcast live on Gyan Darshan, web cast on CIET website and 90 Satellite Interactive Terminals (SITs) under the EDUSAT network of CIET-NCERT. The lecture was followed by discussion. The text of the lecture delivered by Dr. Pitroda is given here.

Dr. Sam Pitroda was welcomed and felicitated by Prof. G Ravindra, Director, NCERT who presided over the programme. Prof. Vasudha Kamat, Joint Director, CIET also welcomed Dr. Pitroda and kindly invited him for delivering the lecture.

It is indeed a special honour and privilege to have this opportunity to talk to so many of you on something that's very dear to me– The Role of ICT in School Education. I would like to break this lecture into five topics; one– I would like to talk a little bit about the rise of India in ICT and what does it means to all of us; two– what is our government trying to do on ICT at the national level; three– ICT and education; four– ICT in school education, and five– some actionable items, so when we all go home, we know what we need to do. I had gone to lot of these conferences in India, I find that there are very important, dozens of conferences on same subject every month, and nothing happens.

It is good to meet people, it is good to talk, it is good to discuss, but at the end of the day, if we don't take some action, it is of no use. The other day, I was at a big conference of 300-400 Vice-Chancellors with Mr. Kapil Sibbal at Vigyan Bhawan and I lost my temper little bit which I tend to do a lot, and I said look we have been talking for five years on higher education. Same thing over and over again, same people, same topics, same agreement. Everybody has great ideas, we should do this, everybody says I liked it, everybody says yes, yes, we understand it, nobody

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does anything. If at the end of today's interaction, we can collectively agree to do two or three things, I think, we will make a big difference in the lives of our children. So let's start with first- ICT, and rise of India globally in ICT. I remember, not too long ago, in 1981, first conversation with Rajiv Gandhi, in Delhi, I had never met him before, but we accidentally met at Mrs. Indira Gandhi's house. Mrs. Gandhi was running little late, so I had time to interact with him, and the conversation we had was very subtle and very short, saying we ought to use information and communication technology in nation building, and not for building business. What does it mean. It meant that ICT could be pervasive in India in the next 20 years, so we will see the role of ICT in everything we do. But to do that, we will have to first focus on telecom. If we can really provide telecom access to large number of people in India over a period of time, this would trigger a whole new revolution and we were also not very clear then, but we had conviction, that information and communication technology is a tool for nation building. We started with a simple idea of improving the telephone access. Then we had 2 million telephones for 750 million people. It used to take 15 years to get a telephone connection. When you get a telephone connection, half of the time, you were waiting for dial tone. From those days to today, in a span of about 20-25 years, we have come a long way. We have 800 million cell phones and we are a nation of connected billion people, which is a huge accomplishment in the history of this nation. I do not think people are paying attention to this great milestone in the history, that all of a sudden, this nation is connected, you can go from anywhere to anywhere, you can talk to anybody anytime, not very expensive, so this big event needs to be celebrated. But also, this event ought to remind us that we need to do things differently. And not do the same way that we have been doing in the past. Along with connectivity to billion people, we have now large number of experts in IT, there are all kinds of brains in ICT in India. Experts in every little narrow field you can find smart young people, talented, well recognised world over. We have build our own companies - TCS, Infosys, Wipro and there are lots of others. No matter where you go in the world, people respect that Indians are full of brains. Scientists, Engineers, IT professional, Software people are all over the world. I bumped them, you know, these people at the airports, international hotels, in weirdest little towns, in remotest corners of this world. I found an Indian software guy, believe me, once I was in a place called Tampere, it is a very small town in Finland and I was with the Mayor, and as we were going out for lunch, I saw 6-7 Indians walking together, so I called them and said "What do you do", they said "we are software people working for Wipro, and doing Tampere's software work for the city". We also generate as a result 70 billion dollar worth of foreign exchange reserve, every year, year after year. Because of all that, now we have hundreds of billions worth of foreign exchange reserve. In Rajiv's time, worst times, we had million-million and half worth of foreign exchange reserve. So world has changed completely for us and the ICT success story ought to give us lot more confidence. Great deal of pride, international recognition, to really look

beyond how we do things today, to how we ought to do things tomorrow. The idea is to improve collaboration, exchange data, Indian government has recognised this now. Prime Minister Manmohan Singh personally is committed to improving education, and information infrastructure. Several years ago, he decided to launch National Knowledge Commission, to look at all aspects of knowledge, including school education, higher education, vocational education, distance learning, open courseware, teachers training, and lot more. You can go to www.knowledgecommission.indiangov.in and you will see, all of the recommendations of the Knowledge Commission. Simultaneously, govt. is equally committed to building the IT infrastructure required to improve knowledge. So first programme of the goverment. is to build national knowledge that work, to connect 1500 nodes to 40 Gigabytes bandwidth to connect all our universities, all our major Research and Development Institutions and all our major libraries. The idea is to improve collaboration, exchange data, and then provide the connectivity that our Research and Development people need. This is going to cost us about 8000 crores, all of this is approved. We are building the network, 212 nodes are already working and this network will be fully operational in the next 12-18 months. In the back of it, we are connecting some 26000 colleges to fibre, so if you have local area network, you have connectivity not only to the national knowledge institutions, universities and all, but also to international because this knowledge, that work is already connecting to European Union, Japan, US in a big way. So you can look at open courseware material from the MIT, Standford, Yale, Cairo University in Japan, Cambridge and so on.

In addition, we are going to be connected with 250 thousand Panchayats to optical fibres. So every Panchayat will have broadband connectivity of 100s of Mega bits and that we will get in two years. This is going to cost us about 20 to 30 thousand crores. So all of this investment today, is being put in to really look at the future of our children, 550 million of young, below the age of 25, we need to educate them, provide them the tools and the jobs for tomorrow. If we don't do that, we won't be able to create 10-15 millions new jobs we need every year, year after year. No government that I know of today, is willing to make this kind of commitment, or spending this kind of money, anywhere else. When we mentioned this to Obama, he was quite surprised that how do you get to convince these politicians to put this kind of investment and that is the kind of vision we have, nobody talks about these things. Our newspapers are full of cricket, bollywood and gossips. This is the real India being created today that hardly people know about. It requires lot of guts, lot of vision, coupled with this network you could do what Nandan Nilekani is doing on UID (Unique Identification Number), Kasturi Rangan is working on GIS (Geographic Information System) and various platforms for payment, procurement, applications, security, servers, you probably will wind up spending 100 thousands of crores. Then the delivery of services will improve, leakage in the Govt. will reduce and you will create a

whole new infrastructure for tomorrow. All of this is in place, its being pushed, some will happen fast, some will have some problems but that is part of growing up, but I can assure you, in 3 years, you will have all of this done. Then we will get to a point of documenting billion people, till date we have already documented 5 million people. This is the biggest programme in the history of mankind to document with fingerprints, facials and all.

People complaint about, you know, piracy and privacy and all, but all of that is taken care of. Any time you do something new, it brings with it little bit of concern here and there. I always give example of a knife. The same knife that cuts fruit, also can cut somebody's body, but you still need knife. So all of these programmes essentially show the vision of this government and its ability to back it up with huge amount of funding.

Third, then is, what do we do with this ICT infrastructure in education? I am very concerned that we are not doing enough with ICT in education. The country that specialises in ICT, does not use ICT for education and government. On one hand, we have all this commitment, but we still have this nadawali file, that runs our govt. So I am one of those people that said that nadawali file has to go. You can't celebrate it some point of time, that nadawali file in government. If you can't do that, you can't go too far. But everyone wants to resist that, because that's the comfort, that's your little blanket, when you are a little kid and you don't want to let it go, but it has to go. Similarly in education, there are lots of opportunities to use ICT but mindset is such, that we will fiddle with it, but we won't change. From my perspective, unfortunately, when we think of education today, we automatically assume duster, blackboard, chalk, teacher, textbook, exam, grades, certificate. None of these things matter any more, you get to kill lot of these things? How do you do that? Immediately teacher would react, saying what do you mean, and if we don't kill the old, we don't create the new.

So how do we prepare ourselves to create something new? When I look at the teacher of the day-to-day, I know that teacher normally creates content and delivers content. I used to have a Professor in Baroda, who took great pride to prepare his notes and not changed them for 20 years. Is it good or bad? Then we thought it was great, when we learned more, we realised a little later that it was a disaster as people would copy his notes, and they would exchange his notes. This whole business of following the same notes year after year creates dumb robots. So do I really need teachers to create content today, because best of the best content is already available on the net, by great experts, I can't do much better, believe me, I can only quickly make diagrams with Indian looks.

But overall, most of the content is created in a good way, lot of content is already being added to that, everybody is creating content right now. And nobody is paying attention to what is already created. So I don't need teacher to create content. I perhaps don't need teacher to deliver content. So what do I need teacher for? I really need a guru, who is a mentor. I need somebody I can go to in difficult times, I need somebody I can look up to, I need somebody I can respect, and know he is there or she is

there for me. But I don't need them to teach me any more. This is the paradigm of tomorrow. It is going to happen, you are not going to resist it, you can try for few years, it is better not to resist it and join the movement. Because this movement is in our favour. So the ICT in education really imply paradigm shift in learning models. It is not about doing same thing we do using the IT. It is about doing different things that we do today using IT. So teachers will have to realise you don't need to deliver anything. You just need to love children, help them, support them, make them feel good, increase their self-esteem, pet them on the back, if they make mistakes, hold their hands, lift them. Because the children are already too smart. I know that when I can't operate my TV, I give it to a 7 years old kid and he fixes it. Because they don't really read any instructions. I have never seen any kid reading any instructions; they don't need any instructional manual, because instructional manuals are only for old people.

I don't know how they figure it out, but they just do it. You see them playing games; their reflexes are so fast.

They are acting in milliseconds, when it takes me seconds to interact. So there is something out there that we don't understand. Do you think all of the stuff that we all grew up with? I had never seen TV in my life before going to America. I had never made a telephone call in India in my life before going to America. This was in early 60's. There were no telephones, hardly few telephones, so if somebody had phone, he would be too rich to be your friend, so who do you call?

But these kids think- this is all given. Cellphone is like your body, everybody wants cell phone. You want a web page, you want facebook, you want twitter, I mean think of this and when the kids go to school at the age of 6 or 7, the teacher is going to teach A,B,C,D, he already knows all that stuff. It is in this kind of eco system we need to think, of ICT in education. It is about paradigm shift, it is about new learning model, it is about doing things we haven't done before. It is not about incremental little tweaking, it is about changing the whole structure of school, classroom, duster, blackboard, teacher, textbook, exam, everything has to change. I don't think we are ready for it. It is a radical departure from how we have been running our educational institutions for hundreds of years. I am beginning to question things like who decide it that it should takes 4 years to get a degree, why do we all take 4 years, Chinese take 4 years, Indians take 4 years, Japanese take 4 years, Americans take 4 years, who so ever came up with the idea must have been very smart that he convinced the whole world. But does this make any sense? I think this is the time to question things that we have never questioned before. And we may not find answers to all these questions. But the fact that we are willing to question, is very important. So ICT in education is all about paradigm shift, it is not about doing same things we do today to set up National Education Foundation, to develop webpage, open source material, establish credit bank to effect transition to a course credit system, even in colleges, it's a shame that I can't take one semester in Kerala, and next semester in Gujarat. I don't know why we can't do that?

You know it is weird system. If my father got transferred from Kerala to Gujarat, I

should be able to go to a Gujarat college, but in our system, we are still following most of the processes that British Raj left behind. At times, we are computerizing same processes and calling ourselves experts in computerising our governance. If we don't reengineer lot of these things, computerisation is not going to help us at all. Then we set facilitate conversions, with conventional universities, set up research foundation to support research activities, on ODE, overall training programmes for educators, increase access for learners with special needs, create a new standing committee for the regulation of ODE, develop system for quality assessment, to me this is all standard stuff. The big idea is how do we change here. So we begin to do things differently. When I met with the vice-chancellors, I told them, just go and look at your websites, it is disaster; you don't need to go too far, can you fix your websites? Look at the websites of all our schools and universities, there is no picture of the professor, there is no background of the professor, it doesn't tell me anything about what they teach, what is their track record, nothing. These are the great institutions, which are producing highly talented ICT people.

I think we need to really go into the basic stuff. That brings me to actionable items, before that I will tell you about two experiments that I know little bit about. There is a fellow called Khan, who has a Khan Academy in the US, some of you may have heard of him. He went to school with my son. He was a successful investment banker, young guy, made some money and decided to quit. I believe he is from Bangladesh. Quit and said what do I do now. So he turned down to one of his cousins, some little kid had some problem with maths, so he started teaching him maths in his free time, then he decided that he should do some web courses on maths. So sitting in his bedroom, on his laptop with a camera, he decided to do some courses on maths- multiply, divide, trigonometry, algebra, geometry and all, started putting on the youtube, and all of a sudden realised that 100s of thousands of kids are watching this. He set up a thing called Khan Academy, run out of his bedroom, you can go see it on the web, one man show, 2200 courses ready; in US hundreds and hundreds of schools use this. Half a million to millions of kids learnt from Khan, see the power of one guy. So I called him and talked to him. I said let me take out the material out and translate it in Hindi. And see, if I can put it on web, not that it is going to change maths teacher in school. Because he will fight it or she will fight it that is okay. But In India, we have this tuition system which I think is the biggest racket in my opinion. If I go to school, pay attention, why should I go to tuition, I don't understand. But everybody goes to tuition, tuition fellow make money, so I said– can I learn at home, and augment by learning in schools, using Khan Academy with the world we are trying to experiment with this in 10 Panchayats.

We are just planning right now in collaboration with the US government, we take some material from Khan Academy, put it in Hindi or Gujarati or whatever and see what happens and learn a bit about the model. Then I can take 10 other smart kids, do something on physics, do something on chemistry,

on social sciences, and get thousands of these courses on the net. His idea is don't bring more than 10 minutes or 7 minutes of material because the attention span then goes away. Let the kid play after 7 minutes, may play games, then come back again after 7-10 minutes to learn a new concept.

Similarly, there is a lady, Nirmala, we met her during Knowledge Commission days four years ago, we again met her yesterday and she has series of things on Maths, developed in India, connected at schools in US who is using her material and have decided to eliminate all those maths textbooks in US, not in India, so we don't need any math textbooks. Just take her materials and that is only way to teach maths. Fascinating stuff, you need to look at, so lot of these stuff is going on, how do we get this and not just say, I am also going on to do maths, but see what they have done can we just try to do little bit to tune into standardised maths, standardise Chemistry, stardandised Physics, so you have at least standard material and then you have extra that you can add to augment that material, rather than 50 people doing same maths and teaching Algebra in 50 different ways and confuse everybody. With this background, let's talk about actionable items.

I am sure you all have challenges related to infrastructure, hardware, software, equipment, funding, these are all given, but can we at least get some schools to have better websites. Can we standardise a website for schools, a template so all our Indian school should have websites like that so people get used to it. If you want to know about teacher, click there, if you want to know about fee, click there, you want to know about admission, click here, if you want to know about facility, click there, so everybody has same feel and touch. That much we can do, what does it take, it doesn't that is have to be 100% right. But we all will have to agree up on whatever we decide.

We can have 15-20 wise people, men, women, teachers whatever, come together and say this is India's schools website format for the next 3 years, then we will review it again after some time and all schools filled that in properly, if I need to go to school website, learn about my school facility, learn about my teachers, courses, fee structure and all the other related stuffs, sports, library, why can't I do it today, I do not understand, that is the starting point. If you can't do that much, don't expect anything more, because this is the real window to your school. Through that website, I can see what kind of school this is. If I look at the faces of the teachers and their experiences and their background, I can tell you, it is really okay school but if no, I will never send my kids here. So one actionable item would be to really focus on standardising websites for school and there may be 3 standards, I don't care, may not be one, may not be agreeable to everybody, we need these websites in local languages, not in English, certain actionable items is to really start focusing on creating domain experts. In 20-30 different school domains, Algebra, Physics, Geography, History whatever you decide and create 10-15 domain experts in that subject and tell them to select standard materials. Again standard is a broad term, but 80% is a standard to me. Can we then say for our kids that this is how the Algebra material will look like? You are already

doing this in schools, in textbooks but the idea is to get rid of textbooks.

The other day I was walking near Lodi Estate, and I saw 6-7 young kids walking. One little kid was about 7-8 years old, malnourished, very thin and carrying a big bag full of books, so I stopped him. He got confused because I don't look normal with my hair, and beard and all, may be he thought I might rob him of something, so I said I want to talk to you. I asked what is this?, he said "Kitaab Hai". Why so much, he said "I have to carry all these to school" I said you just go and get a cart with wheel that we get at the airport I said "you shouldn't carry all these in your bag", must have been at least 35 pounds, the books were very thick, so I asked "do you do it every day". He said "yes every day". "Why can't you leave these books at home?" He said "no, my teacher will fire me or whatever, she does". Poor kid was so miserable because parents and teachers have told him that you better to carry these 35 pounds, may be 40 pounds, that's okay, just sick and nobody is concerned about it. I just don't get it. Everybody thinks this is a normal thing to do. I don't think when I was 7 years old, carrying so many books, and I studied okay. Something must have been done, right? What is that we are doing that requires 35 pounds of books. I think we need to look at some of these things very carefully. I think that we are losing the interest of our customer, our customer is out there, poor customer has no voice because parents know what is good for them, and teachers know what is good for them and its okay, this is the way the things are supposed to be. Our kids are not supposed to be taught to question. I remember growing up as an Indian father, I assume that you know what is good for the kid, and first shock I had was when my daughter was 7 years old. When I said something, and she said "that is not fair". I said "What do you mean", she said "Dad, that's not fair". And I started thinking that may be she has a point here, I think its fair but it is not fair, thereafter everything I did, first I asked questions, is it okay with them. If it is okay with them, then its okay with me, so never asked what grades you make, never in my life. I have two kids, never asked them where do you go, what do you do, if you do come at 3 o'clock in the morning, okay come at 3 0'clock in the morning. I trust you; I love you and I am there for you, you are a free bird. Only thing I can do as father you can look up to, because that is in my control, and nothing is in my control except that but I guarantee you that I'll give you a father, that you will look up to and say okay. He doesn't hide on income tax, doesn't cheat, does his stuff, he is fare to everybody. And that's makes a big difference. I have learnt that in my life. Our children don't have a voice in the system. And I think we need to really listen to them as to what their needs are, what are we trying to teach them, are we really teaching them the right stuff, do they really need to know all of these stuff that we think they need to know, does that really help them be a good citizen, if after all these turn out to be they would into a corrupt, and useless, what had we taught them. I get lots of chance to speak in America, which I do a lot, once I was invited to speak to by Condolisa Rice, to speak to 400 Vice Chancellors and Presidents in Washington, Presidents of Universities including Harvard, MIT and everybody, I said look, one hand we are

talking about grade, higher education in this country America, and 2 per cent of Americans are in prison. It is a huge number, And they are building more prisons. Everybody says more police, I said what is wrong with your education, how could 2 per cent of people in prison in a country where this education system is so great. Because We are focusing more on quality of products, we have quality control all this mathematical modelling, for quality of a product but not of people. We don't produce six sigma quality people, we produce six sigma quality products, there is a huge difference. We want to produce six sigma quality kids, and the actionable item is to really get this domain experts, prepare material, put it online, eliminate textbooks, I know printing press guys will be very unhappy, I know book publishers will be very unhappy. That's the transformation we are talking about. So kids have one little device ultimately, may be not now, may be 5 years, may be 10 years down the road and everything is online and everything is searchable, and everything is worth exploring and the world out there opens up all of a sudden.

I remember Rahul Gandhi and I had gone to Amethi and we had inauguration of some computer, and one little kid was there and they had dressed him up, everybody was there, TV was there, Rahul Gandhi was coming, so he goes there and asked him to do something and he did it quietly, nice kid, so I said you know what thing is this, he said no, so I said "from here you can see the whole world, you don't need to go anywhere", I said 'this is not software, this is not computer, it is a new window for you'. In Hindi, I said "Khidki se dhekh sakte ho, this is a new khidki" so I said who do you want to see. After looking at three other people, he said "Tendulkar", we typed Tendulkar, then Tendulkar was on the screen and I said "what do you want him to do", so he said "I want him to play, hitting a six" or like that, we did that and he was amased. The kid thought this was magic, think in his term or her term, I think everything we do, has to have kids as the focus. I have taken longer time than I thought, but you know I don't get chance like this. To talk to real teachers, who are concerned about this but I would say we have a lot of actionable items we can work about that but I think I have conveyed my concerns to you. We can open up for question-answers; I can stay little longer, if you wish. But I am very concerned about the future of our children, I am very concerned about using IT for a paradigm shift, I am not happy with the incremental thing we do and the way we do things today, it has to change, and we need people like you to make that change. Okay….Thank you.

Vocational Education: A Mean to Educate and Empower the Socio-economic Status of Marginalised Communities

E. Arumuga Gandhi*

Abstract

From the days of the Wood's Despatch there has been loud cry for the introduction of vocational education as the solution to the educational problems of the country, endorsed subsequently by several Commissions and Committees of both British and Independent India. The national leaders of India such as Mahatma Gandhi had supported it to be introduced in school education. Through diversification and by tracking the students in higher secondary vocational stream, it was believed that many educational problems could be solved. Vocational education is concerned with providing facilities for a sizeable section of students for whom bread-winning is far more important than the pursuit of higher education: And to prevent an unhealthy influx into higher education, it is essential to evolve a system of education and training quite apart from general education, which aims to prepare the students for prospective vocations. Treating and offering vocational education through a separated vocational stream of education as offered at higher secondary stage would best do this preparation. Hence, it is the felt need to evaluate that to whom the vocational education has been benefitted as conceptualised and proposed. The present paper discusses the generalisations derived through the study.

Introduction

Existing traditional occupations require adopting of modern ideas and quantity of production. The demands for the new skills arising out of various developmental programmes, especially in the rural areas, have to be identified carefully to assess the manpower requirement. Hence, vocational education is viewed as the solution to the educational problems in the developing countries. It is believed that many education problems such as unbridled demand for higher education, the financial crisis in education and unemployment among college and secondary school graduates could be solved by diversifying the secondary education curriculum. Therefore, such a kind of education would be helpful in developing what can be formed as 'skill-culture' and attitude towards manual work in contrast to pure academic

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culture and preference for white collar jobs; and to serve simultaneously the "hand" and the "mind", the practical and abstract, the vocational and academic. Students getting job linked courses can be encouraged for self-employment.

As an antidote to urban biased elite education vocational education will promote equity with a rural bias and serve the needs of relatively poor people. Also as Grubb states vocational education has been seen as the answer to enrolment problem; the tendency of some students especially lower class/ caste students to drop out of schools without occupational skills — a problem that vocational education promise to resolve by providing a more interesting and job-relevant curriculum. More specifically, it is believed to be an effective answer to rural problems, to alleviate unemployment; to reorient student attitude towards rural society; to hold urban migration; to transmit skills and attitudes useful in employment and as an important measure of development for disadvantaged youth in rural and urban areas.

Need for the Study

The role of education in facilitating social and economic progress is well recognised. It opens up opportunities leading to both individual and group entitlements. Education in its broadest sense of development of youth is the most crucial input for empowering people with skills and knowledge and giving them access to productive employment in future. Improvements in education are not only expected to enhance efficiency but also augment the quality of life. Educational institutions at different level are required to serve as agents of socio-economic change for the betterment of the society. Education should necessarily serve as a developmental input to meet the needs and challenges of a changing society. The need of the hour is to ensure that education at all levels help either self-employment or assured paid employment. The need for changes in the existing education system so as to make it job-oriented, purposeful and meaningful has been well-recognised.

Historically, education in India was designed to offer academic knowledge in humanities, social sciences and sciences for advanced studies and research. Though there is a need for this kind of education, it has not produced the necessary manpower required for many economically productive activities in business, industry and trade. Almost all the Committees and Commissions on educational reform, appointed over a period of time, emphasised the importance and need for vocational education in India. Most of them stressed the necessity of enriching the vocational content in the curricula at the secondary school level.

General or Vocational education? This is a "tough choice" and has been a matter of concern of many developing countries for a long time. The objective of vocational stream at higher secondary stage is to prepare students for the world of work and make them employable for a broad range of occupations in various industries and economic secto` It is expected to provide vital manpower—at middle level—needed for the economic service sectors and provide opportunities for self-employment or

profitable employability, thereby easing the problem of unemployment. Thus, the vocationalisation of education is the necessity to meet the demand of the individual and society. Education must be provided in such a way that it can produce self reliant and self-dependent citizens. Hence, it is a felt need to evaluate that to whom the vocational education has been benefitted as advocated and conceptualised so that a study has been conducted among the schools offering vocational education at higher secondary stage in a district of Tamil Nadu.

Objectives of the Study

The present study on the vocational stream of education offered at higher secondary level was carried out with the following objectives:

- To know the socio-economic status of the students pursuing vocational stream of education at higher secondary stage in the area selected for the study;
- To assess the status of vocational courses being offered at higher secondary schools;
- To comprehend the profile of the students of vocational stream;
- To evaluate the impact of some selected variables on the students' enrolment in vocational stream;
- To elicit the previous academic performance of the students pursuing vocational stream of education;
- To know the students' perception towards vocational stream education and their future plan; and
- To suggest ways and means to improve the quality of vocational stream education at higher secondary level.

Setting of the Study

There are 152 higher secondary schools in Tirunelveli district of Tamil Nadu of which 88 schools (57.9%) offer vocational subjects at higher secondary stage. Among those schools which offer vocational subjects, one-fourth (22) of them are selected as sample for the present study by using stratified random sampling method. For the selection of the sample schools, the schools were stratified into two broader categories viz., government and government-aided higher secondary schools.

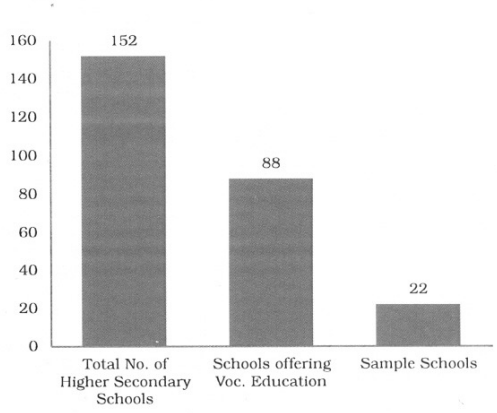

Fig. 1: Higher Secondary Schools in Tirunelveli District

The sample schools were selected proportionately from each group randomly. From the total of 1984 students enrolled from both standards (XI & XII) one-fifth (398) of them were proportionately selected as the sample for the present study. Both for convenience and to collect and systematic and

unambiguous data all the student-respondents were approached outside the school campus with the help of a structured interview schedule. To arrive at general conclusions the collected data were analysed by applying Karl Pearson's correlation and tests of significance along with descriptive methods such as percentage, proportion and ratio and presented in summary form. Besides, to through more light on the study Mean also computed for some selected variables.

Summary of the Study

Vocational Subjects Taught

While analysing the vocational subjects taught in the sample higher secondary schools, about 55 per cent of the total schools offer only Business and Commerce vocational courses, followed by another 18.5 per cent schools that offer Engineering and Technology along with Business and Commerce courses. Another 18 per cent of the total schools offer Engineering and Technology, Health, Agriculture, and Home Science alone. Both Business and Commerce and Health are offered in only one school.

However, none of the government-aided schools offer Agriculture; and the same with Home Science by government schools. The study reveals that the other vocational subjects like Computer Science, Photography, Tourist Guide, and Music are not offered in any of the government or government-aided schools in Tirunelveli district. In other words, the district does not offer all the vocational subjects at higher secondary stage. Three-fifths of them offer only one vocational course while another 31.8 per cent schools with couple of courses. Only 9 per cent in the total higher secondary schools offer more than two courses.

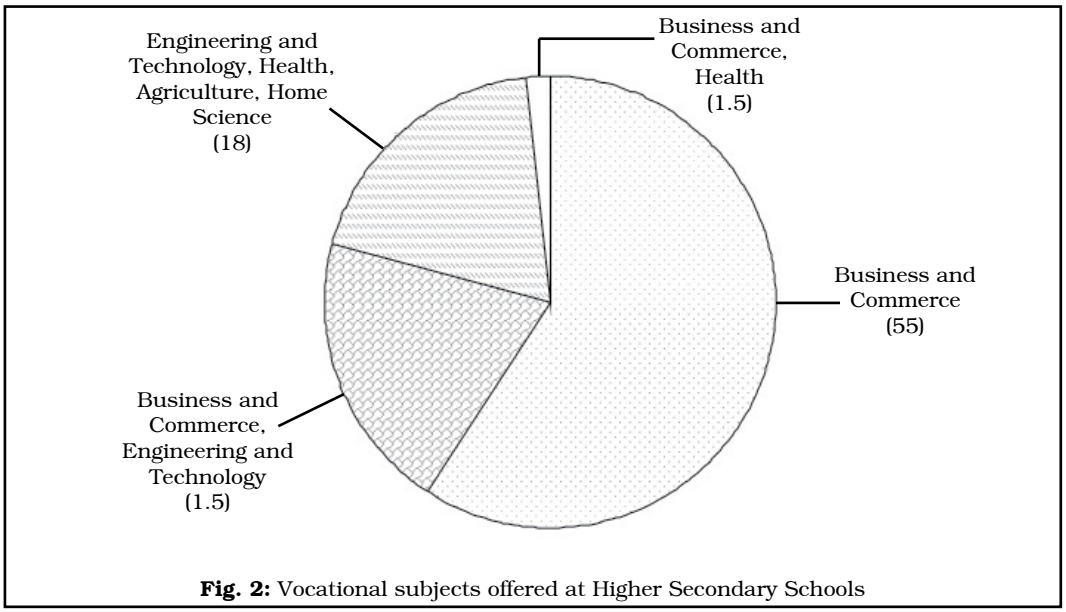

Fig. 2: Vocational subjects offered at Higher Secondary Schools

A Profile of Vocational Stream Students

The analysis of the students' subject of study reveals that a vast majority of them studying Business and Commerce (70.8%), followed by the Engineering and Technology (14.8%), Health (7.3%), Agriculture (5.1%), and Home Science (2.0%). More than half of the students (53.1%) studying in government-aided schools while the remaining 46.2 per cent in government schools. Most of the students of Engineering Technology (84.7%), and Business and Commerce (52.1%) study in government-aided while about 70 per cent students of Health in government schools. Most of the Health (93.1%) and Engineering and Technology (69.5%) students belong to urban schools while 66.3 per cent of Business and Commerce belong to rural schools. However, all the students of Agriculture and Home Science subjects are from rural schools. It is found that the students pursuing vocational education are mostly living in rural and they constituted about three-fifths (59%) in the total students. However, it is significant to note that 65.5 per cent of the total female and 52.9% of the male students are from rural areas.

Socio-Economic Determinants of Vocational Education

As far as the analysis of determinants of vocational education variables such as students' sex, religion, caste group, parental education, occupation and their monthly income, birth order, household size, distance to school from their place of residence and mode to reach the school, annual expense for vocational education, their previous academic performance and marks secured in SSLC are concerned.

Sex

Half of the (51.2%) total students are males while the rest 48.2 per cent constituted by females. Females out numbered males in Health (79.3%), and Business and Commerce (56.7%) while males in Agriculture (85.0%). The admission is restricted to females in Engineering and Technology while males in Home Science. While about two-thirds of the total females preferred government schools, government-aided schools by 55.2 per cent of the total males. About two-thirds of the total males belong to Most Backward Castes while 42.8 per cent of the females are Scheduled Castes. However, males constitute more than 60 per cent in all caste groups.

Religion

A vast majority of the students are Hindus (70.6%), followed by Christians (23.6%) and Muslims (5.8%). About 60 per cent out of the total Hindu respondent-students are females while 77.7 per cent of Christians and 78.3 per cent Muslims are males. Hindus predominates in all vocational subjects and they constituted nearly three-fourths in Business and Commerce (73.4%) and Health (72.4%), and three-fifths in Home Science (62.5%), Engineering and Technology (61%) and Agriculture (60%). However, no student of Health subject belongs to Islam.

Caste group

More than one-third of the total students belongs to Scheduled Castes

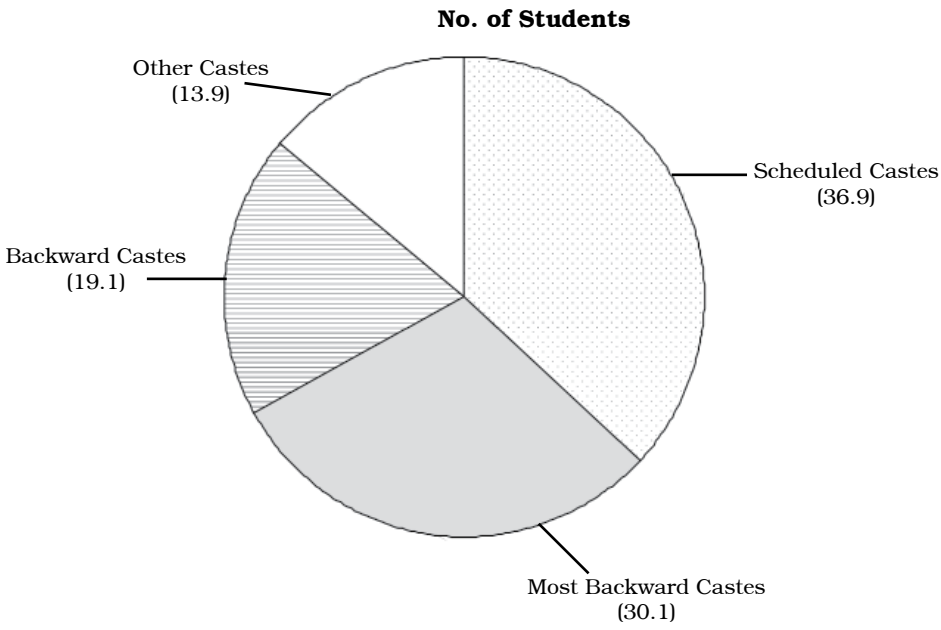

Fig. 3: Caste Group of the Vocational Students

(36.9%), followed by Most Backward (30.1%), Backward (19.1%), and Other (13.9%) Castes. About 44.7 per cent of Scheduled Castes study Business and Commerce courses while about 34 per cent of Engineering and Technology by Backward Castes whereas Most Backward Castes dominates both Health (34.5%) and Agriculture (45.%) subjects.

Parental education

It is found that 42.2 per cent of the total students' parents are literates, followed by 30.7 per cent illiterate parents, 18.6 per cent secondary school graduates. Only 8.5 per cent of the total is obtained higher secondary (5.3%) and collegiate (3.2%) education. Hence, it is found that almost two-thirds (66.1%) of the total students' parents pursued school education only. It is to be noted that 88.5 per cent of illiterates' children pursuing Business and Commerce courses.

Parental occupation

Of the total students 28.9 per cent of their parents are daily wagers, followed by farmers (27.6%), businessmen (20.4%) and self-employed people (8.2%). The remaining 14.9 per cent parents are employers of government and private secto` Nearly half (48%) of the total of Engineering and Technology, one-fourths of Health (27.6%) and 55 per cent of Agriculture students are the children of farmers whereas about 40 per cent of the total Business and Commerce students are children of daily wagers.

Parental income

More than half (54.5%) of the students' parents earns of ₹1000–3000/- per month, while another one-thirds (37.6%) parents earns ₹3000–5000/-. The average income for the students' parents is ₹ 3,362/- per month while ₹ 3,578/- by males' parents whereas ₹ 3,134/- stands for females' parents. However, lower income parents (₹ 3,076/-) admits their children in government schools while earners of ₹ 3,607/- in government-aided schools.

Birth order

More than half (53.3%) of the students are at third by order of birth, followed by another 23.4 per cent of fourth ordered students. While the second and sixth ordered constitutes 9.2 per cent, each respectively. The mean birth order of the students is 3.3, irrespective of sex.

Household size

Nearly half of the total students are from small families (48.2%), while another 30.9 per cent students belongs to medium size families. The remaining one-fifths (20.9%) of the total are from large families. The average household size of the students' family is 6.1. While males pursue vocational education from 5.4 members' family, females are from 4.9. It is proved that medium size families' respondents are highly subjected to study vocational education. It is found that while the small size families prefer government-aided schools, government schools by medium size families. The average house hold size of the students of government-aided schools is 3.9 while 6.7 stands for government school respondents.

Distance to school

Half (51.8%) of the total students studying in the nearby schools and among them three-fifths (59.8%) constituted by females while the remaining other students are in 4 – 15 km radius. The average distance to school from the students' residence is 4.5 km, irrespective of sex. It is found that the students who reside within an average of 3.8 km circle studying in government-aided schools while 5.3 in government schools. The highest earners allow their children more than 7 km while the less earners limits within 3.3 km.

Mode to commute school

Three-fifths of the total students reach school by foot, followed by cycle (35.4%) and bus (24.5%). It is found that the females are allowed to go to school only if the school is commutable distance either by foot or cycle while the males' mode of conveyance is bus.

Annual expense

It is found that while male students spent an average of ₹ 2,196/- per year, the females ₹ 2,278/-. However, the mean expense for the total students is ₹ 2,236/-. To a greater extent the students' caste group to which they belong influences their expense for education. While an average of ₹ 3,118/- spent by the other castes, the expense made by the scheduled castes is ₹ 1,901/-, per annum. It is found that instead of average expenditure the students who studying in government schools spent ₹ 2, 005/-, per year, lower than the students of government-aided schools (₹ 2, 434/-).

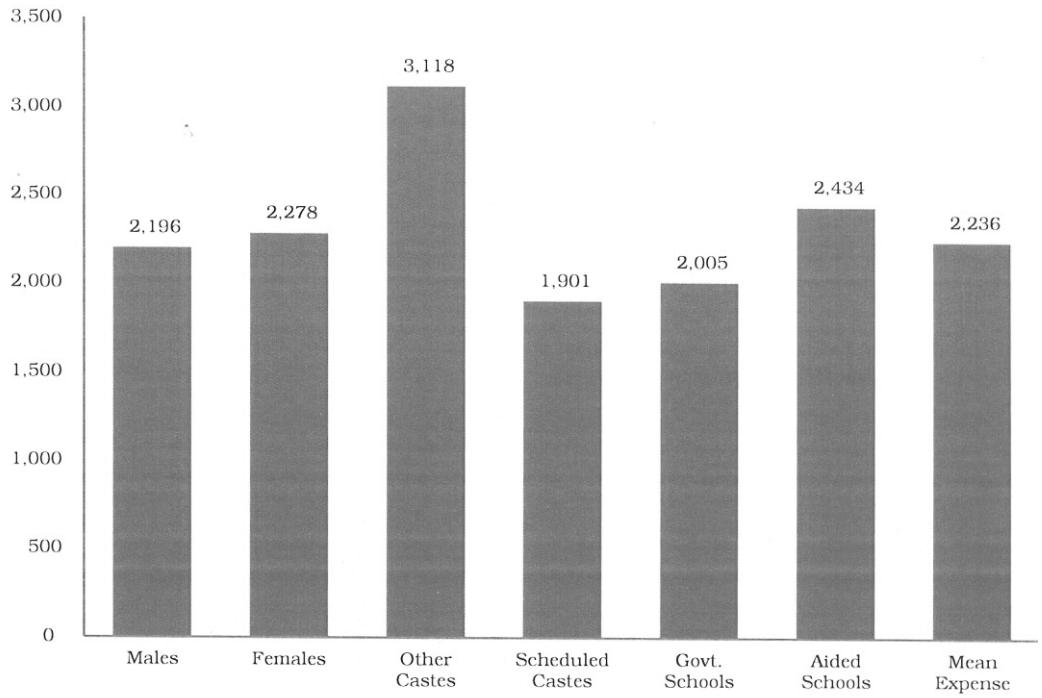

Fig. 4: Annual Expenditure for Vocational Education

Previous Academic Performance

More than one-fifths (21.6%) in the students had failed in any of the classes in the school and nearly three-fifths (57.0%) of them had failed in X standard. Among them there are more males than females and almost all they are from agricultural families, irrespective of sex. Poor performance in annual examinations, absent from attending the examinations, irregular attendance of the classes and sick are the causes for their failure in secondary school leaving examinations and most of them failed in Mathematics and Languages.

Marks in SSLC

About two-thirds of the students (65.3%) have secured average marks of between 40–60 per cent in secondary school leaving examinations (SSLC), while another 22.4 per cent have secured 60–70 whereas 70–80 have secured only by 12.3 per cent. Of the total males 72.1 per cent of them secured 40–60 per cent marks compared to 58.2 per cent of the girls. However, against mean marks of 280.5 of the total students girls scored 288 while boys scored only 273. While the rural students have secured an average of 266 marks (53.2%), the urban students scored 302 (60.4%) out of five hundred.

TABLE 1
Mean for some Selected Variables

Variable	*Mean to the total (N=398)*
Birth Order	3.3
Distance to School (Km)	4.5
Household Size	5.1
Annual Expense (in ₹)	2,236/-
Parental Monthly Income (in ₹)	3,362/-
S.S.L.C. Marks (out of 500)	284

Perception Towards Vocational Education

It is found that almost all the students enjoying vocational education in terms of practical as well as theoretical handle by the subject experts and preferring more classes since the medium of instruction is Tamil. All the required practicals are conducted at the schools itself and the subject teacher will evaluate them, always. Irrespective of subjects, all the students are availed of the required apparatuses for their practical and opined it would benefit them if found more. However, most of the students expressed their dissatisfaction regarding the quality of practicals and apparatuses availed for them, excluding the students of Business and Commerce which do not require more than paper and pen, since they constitute half of the total each respectively. More than half of the totals are satisfied regarding classrooms so that they are all perceived moderately. However, none of the students are provided of either laboratory or workshed or both for practicals.

A vast majority (84.9%) of the students themselves selected vocational education while the rest because of others like friends, parents, siblings, acquaintances, and relatives. However, about 30 per cent of the themselves selected students preferred vocational education since they perceived it as better than humanities, for self-employment and guarantee for employment, and with the intention of continuing professional education. Only few in the total perceived that vocational education is easy to pass through. Therefore, a large majority of the students are not bothering about the denial of academic stream courses for study to them.

Almost all the male (90.7%) and female (88.7%) students hold the perception that the expense for vocational education is moderate, similarly between rural and urban students. While about half (49.5%) of the government schools' students opined that the expense is low, the same expressed only by 11.6 per cent students of government-aided schools. While the students of Engineering and Technology, Home Science and Business and Commerce are at moderate, Agriculture and Health students opined the expense for studying their subject is high. It is to be noted that irrespective of caste group all they are at moderate regarding expense.

It is found that however, almost all the students are in dissatisfaction regarding the infrastructure availed at school such as library, lavatory, sports and drinking water while about half of the total perceived, however moderately towards cycle shed. None of the students enjoyed retiring room facilities in their school, irrespective of government or government-aided.

Perception Toward Future Plan

It is found that except the students of Engineering and Technology, none of them are interested towards either self-employment or entrepreneurial efforts since the content of the higher secondary vocational education is not adequate so that all they wished to continue their education in academic. However, all their parents have high regard regarding the nature of education pursuing by their children, according to the students. Most of the students perceived that the vocational education could change the caste-rid social status by the way of economic mobility and achieving novel identity.

Conclusion

In concluding the present study it is to be noted that a large majority of the students pursuing vocational education came from rural areas. More than one-thirds of them belong to Scheduled Castes. More than half of the students are children of daily wagers and farmers and their parents have a family income of around ₹ 3000/- per month. A large majority of them belongs to medium size families and third by order of birth, and do not have any traditional vocational family background. Their choice of selecting vocational education is mainly due to the marks secured in the secondary school leaving examination. They did not incur a huge expenditure for vocational education. What the findings of the study as a whole evidences that the vocational stream of education is achieving its objectives through attracting the socially economically deprived and marginalized students by imparting vocational skills to venture either self-employment or in search of employment instead of continuing their education in academic courses.

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Vocational Education and Training for the Adolescents: Challenges and Opportunities

VINEETA SIROHI*

Abstract

Stepping into the threshold of vocation is the most crucial phase for an adolescent, as it creates a perpetual impact on the individual's life. In view of the country's demographic structure, characterising declining dependency ratio, demographic bulge and possessing youngest workforce offers an opportunity for India to become a reservoir of skilled workforce against the global manpower shortage. India's transition into knowledge economy and the changing demands of the workplace requires new kinds of skilled workforce. The paper is an attempt to reflect on the opportunities and challenges posed by the global scenario and suggesting a paradigm change in the vocational education and training system in order to respond to the demand and supply mismatch of the workforce.

Context

Within the landscape of education for adolescents, few themes evoke such a ready response as vocational education and training. Nearly every stakeholder whether, educational administrator, educationist, teacher, parent or adolescent himself seems to be convinced of its value. But before we join in the chorus of approval, we should be clear as to what is adolescence? And who is an adolescent? Adolescence is the critical period of human development manifested at the biological, psychological and social levels of interaction marking the end of childhood and setting the foundation for maturity. It is a transition period characterised by an erratic, emotional, unstable and unpredictable individual and this transition demands for adjustment which is intensified with the adolescent stepping into the threshold of work. Moreover, out of school adolescents are those who cannot participate in the formal conventional schools in stipulated hours of the day as large number of them are engaged in productive labour.

Accomplishment in the workplace is quite important for an adolescent as the individual's vocation transforms his whole life style and also confines his

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status and role in the society. Unrealistic vocational goals and misplaced workers lead to dissatisfaction and unhappiness. India's transition to knowledge economy requires a new generation of educated and skilled people to be able to respond to the needs of the labour market. The current education system is meeting the demands of semi-skilled and skilled human resource to a limited extent while ignoring the demands of unorganised sector of the economy which provide employment to more than 90 per cent of the work force. Neither the formal system allow the leeway of continuing education for workers who need further knowledge and skills nor is there any mechanism by which the training acquired through informal system could be recognised. The changing nature of work requires adolescents to be 'work ready' to ensure economic competitiveness in a global context and lead change in organisations. In this backdrop, young people need to be geared up in a wider and progressive framework to align with rapidly changing and technically oriented vocational demands of the society. The education of out of school adolescents need to be addressed separately. It must be linked with empowerment (enhancing self esteem, self-confidence), survival and employment.

Demographic Situation

India has a population of about 24.03 crores adolescents in the age group of 10-19 years in 2011, which is similar to the adolescent population of 24.15 crores in 2006 (Population Projection for India and States, 2001-2026). Out of these, we have about 3.04 crores illiterates and 4.77 crores literate below primary level. The number of left school adolescents is huge amounting to 4.99 crores in case of younger adolescents (10-14 years) and 2.81 crores in case of older adolescents (15-19 years). So we have a target of addressing to the diverse needs of 7.8 crores out of school adolescents (NSS 61st round).

Despite the increasing trends in enrolment ratio there are continuous drop outs at each level of education. The dropout rate is progressive with each level of education as is evident from 2006-07 data, which shows that a large number of adolescents (60 per cent) drop out at the secondary level and about 45 per cent at elementary level, while the drop out rate at primary level is 25 per cent (Manpower Profile, 2009). With huge number of drop outs and poor quality of schooling, one of the major concerns for adolescents is the world of work. Entering into the world of work without completing their minimum required education, lowers their self-confidence and self-esteem, deteriorating their personality. It is this group that needs special interventions for their wholesome development, exploring their talents, providing awareness about the available opportunities in the world of work, developing their abilities and providing skill training for work and life.

An analysis of workforce participation rates across region and gender indicates that the rate of work force participation is greater in the case of rural population of adolescents as compared to urban population. Whereas the proportion of workforce participation is more among males of older adolescents (15-19 yrs.) both in rural (47.5 per cent) and urban

region (30.4 per cent) as against the females in rural (27.1 per cent) and urban region (10.5 per cent) in the same age group (Manpower profile, 2009).

With regards to the labour force participation rate, it is found to be 36.8 per cent among the older adolescents (15-19 years) where the rural population (40.7 per cent) outnumbers the urban population (25.5 per cent). Figures on the gender variable indicate that the proportion (47.3 per cent) of males is just double the proportion (24.0 per cent) of females (Man power profile 2009).

NSS 62nd round reveals the abysmal situation of vocational training, indicating only 6.1 per cent of adolescents in the age group 15-19 years who received vocational training (formal and informal) including one per cent who were receiving formal vocational training. A huge number (93.3 per cent) of adolescents did not receive any vocational training formal or informal. There is no evidence of gender disparity in respect to the proportion of those who have received vocational training and those who have not. However, rural-urban differences are evident among those who received vocational training indicating 5.7 per cent rural persons against 7.4 per cent urban persons. The proportion of rural males (5.9 per cent) and females (5.4 per cent) who received vocational training either through formal or informal means is much less than the proportion of urban males (7.6 per cent) and females (7.2 per cent). The statistics point to the immediate need of training opportunities for both rural and urban areas but with a priority to the rural areas.

Moreover, India's declining dependency ratio from 0.73 in 2001 to 0.59 by 2011 presents a sharp contrast to other countries (Technical Group on Population Projections). This ratio would give a comparative advantage on cost and competitiveness over other countries with high dependency ratio. In addition to this, India has an edge over others for another 25-30 years due to the demographic bulge in the age bracket of 15-29 years and possessing the youngest work force with a median age below China and other OECD countries. India would have a skilled surplus of 47 million and become a global reservoir of skilled persons against the skilled manpower shortage of 56.5 million by 2020 (US Census Bureau, BCG. 2008). This demographic dividend needs to be harnessed which if equipped with adequate skills would enable the young people to seize global employment opportunities in the future.

Way Forward

To respond the demand and supply mismatch on several counts and burgeoning demand of skilled workforce, vocational training system needs to be revamped keeping in view the diverse needs of the heterogeneous population of the adolescents.

Education and training needs to be integrated and seen as a lifelong process in order to enhance the quality of life. Currently, there is no provision of credit transfer among lifelong learning institutions in India. There is need to develop close interface with all the sectors of education and formulate strategies for accreditation and recognition of

prior learning to facilitate a seamless path for learners and enhance their opportunities. The policy in this regard must be defined and linked to the mainstream educational policy agenda.

Pertaining to the curricular reforms, the curriculum should focus on developing generic abilities in terms of instrumental, interpersonal and systemic competencies. The societal trends, burdened with absurdity, delineate the context and the paradigm in which our future educational system would have to be entrenched. Given the whole host of possible vocations and changes in the nature of work, there is need to stimulate broader range of competencies permeating the whole curriculum to successfully accomplish generic rather than specific tasks, so that the adolescent may be empowered within the changed paradigm. Hence, dovetailing of generic skills with the vocational skills is required. Vocational education should entail designing a broader educational curriculum and widening the learning horizon.

Introducing work-oriented programmes into the curricula becomes intriguing, which would ease transition from school to work, lead to change in attitudes and help in developing an ability to participate in the life of the community. Exposing students to the world of work, which helps to sensitise them towards various kinds of work, ranging from manual labour to intellectual and those who perform these tasks. Curricular restructuring in this regard would include mandatory engagement of adolescents with different kinds of work, which would make them ready for their entry into the world of work. There is need to synchronise the world of work more closely with educational institutions. Work orientation needs to be introduced at all stages of education with different objectives. Primary and upper primary stage should focus on developing positive attitude towards manual labour, observation of work situations and production processes, experimentation with materials, tools and techniques, involving handicrafts, using indigenous and low cost materials. While at secondary level it would be a pre-vocational programme followed by highly specialised vocational courses at the senior secondary level.

The formal curriculum must relate to the life of work and provide for possible entry points for adolescents to continue studying while working. It should also have a wide range of programmes that are flexible to suit all target groups. Short term courses that promote hands-on learning with emphasis on knowledge and skills need to be introduced more for those who cannot attend long term courses. With the increasing demand for skilled and multi skilled labour the concept of multi skilling is quite promising in the wake of critical skill shortage, thereby increasing the flexibility and productivity of labour force.

The capacity of organised sector to absorb additional accrual to the labour force taking into account the current inflection on modernisation and automation is limited. In other words the overwhelming upsurge in the labour force will have to be adjusted in the unorganised sector. It is the unorganised sector which occupies substantial place in the Indian economy

and bolsters entrepreneual activity. Given the huge size of India's informal workforce, the need to address the skills of informal sector is more critical than any other. Systematic efforts need to be made to impart training in skill development and upgradation, required by the unorganised sector which needs to be formally introduced in the curricula and training courses. As employment opportunities in the formal sector shrink, the acquisition of entrepreneual skills and self employment becomes a major imperative in the design of vocational training programmes. Entry into self employment and entrepreneurship depends more on entrepreneual behaviour than on mastery of specific vocational skills. Education for enterprise would be an effort to introduce knowledge and skill elements into the curriculum related to entrepreneurship, self employment and small business development. So, skills for entrepreneurship may be incorporated in the vocational education programme, so that it may be a source of self employment and would also generate employment for many others.

Assuring employability of potential trainees begin with effective guidance and counselling to assist the adolescents to make realistic choices about the training programmes and vocations in relation to their aptitudes, personality characteristics and academic background. Since lack of proper and adequate information lead to career dilemma and wrong decisions, professionally trained vocational counsellors are required in every school, so as to assess the aptitudes of students and provide extensive information about the world of work. Moreover, adolescents from the rural areas move to urban areas in search of jobs. This phenomenon of urbanisation is a reality that vocational education programme must take into consideration. Career counselling services need to be designed to address the inimitable vocational needs of these young people from rural background. These services would help in preparing those who plan to leave their rural dwelling in pursuit of jobs in an urban milieu and also draw their attention to the worth of vocations that may be pursued within the rural milieu after training and education.

A typical problem of our vocational training system, in general, is that there is no provision of flexibility to tailor the courses around local vocational training demands. Hence, skill mapping needs to be done to identify the local requirement of skills, so that workforce may be prepared for the specific local requirements and jobs.

Skill testing, certification and equivalence are important for employability as this would open avenues for entrepreneurship, recognition for future skill development in the globalised world. In reference to lifelong learning it is important to transform workplace into an educational set up and a centre of vocational education and certification.

Another major limitation of the vocational education and training is the lack of involvement of industry in planning and running of training system. The industrial associations that integrate small and micro-enterprises of the unorganised economy are not

involved in the state training systems. Hence, industries should be involved in planning and running VET system since they are the ultimate source of placement.

Conclusion

On a sustainable basis vocational training system must be labour- market relevant, efficient, diverse and of high quality. Since the issues pertaining to vocational training are multifaceted, therefore formulation of effective policy for vocational education and training would require an interdisciplinary approach with effective partnership of all stake holders and coordinated effort of the Centre, State, NGOs and private bodies. It is the need of the hour to develop productive manpower as per international competency standards through formal and non-formal programmes and at the same time give recognised qualifications to the large population of unemployed young people through skill training for wage/self employment. Hence, there is a need to explore the various approaches to reach the adolescent world beyond schooling within the framework of lifelong learning which covers formal, non-formal and informal patterns of education and attempts to integrate and articulate all structures and stages of education along the temporal and spatial dimensions.

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Inclusive Education for Disabled—Teachers' Reflections

VISHAL SOOD* AND ARTI ANAND**

Abstract

Inclusive education is the need and demand of present day cohesive and inclusive society. The fundamental rights enshrined in our Constitution make provisions for access, equity and equality of all type of opportunities (including educational opportunities) to all persons irrespective of their class, caste, creed, religion and physical and psychological variation. This calls for the adoption of principles of imparting education to all type of children in inclusive situations. Hence, the present investigation was undertaken to study the views and perception of elementary school teachers regarding different aspects of inclusive education. The data for the present investigation were collected from 200 elementary school teachers from Kullu and Kangra districts of Himachal Pradesh with the help of self-developed 'Scale for teachers' attitude towards inclusive education' and a 'questionnaire' for elementary school teachers. The data were analysed with the help of percentage analysis and responses to open-ended questions in the questionnaire were interpreted with the help of content analysis technique. The results revealed that majority of teachers possessed moderately favourable opinion towards different aspects of inclusive education. However, certain problems have been highlighted by the teachers that are acting as hindrances in making inclusive education, a successful venture. The suggestions have also been formulated for making inclusive education more effective in near future.

"... Every society that values social justice and is anxious to improve the lot of common man and cultivate all available talent must ensure progressive equality of opportunity to all sections of the population. This is the only guarantee for building up of an egalitarian and human society in which the exploitation of the work will be minimised."

— The Education Commission (1964-66)

To achieve the aforesaid objectives, various educational provisions have been made in our Constitution in the form of fundamental rights and directive principles of State policy. One of the major milestones in this direction is that the education up to elementary level has been made a fundamental right. But, for making educational process,

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effective and inspirational in nature, the individual differences of the learners must be taken into consideration. It is also because there can not be child-centred education without realising differences and similarities among learners. In view of the individual differences, it is also evident that same curriculum, same methods of teaching and, in some cases, even the same educational institution will not serve the individual needs of children. At the same time, it must be appreciated that there cannot be, in general, individualised instruction in formal system of education. Hence, the solution to all such problems lies in the concept of 'Inclusive Education'.

Inclusion is a concept that sees the children with disabilities as full time participants in and as members of their neighbourhood schools and communities (Knight, 1999). Inclusive education, as an approach, seeks to address the learning needs of all children with a special focus on those who are vulnerable to marginalisation and exclusion. It implies all learners – with or without disabilities being able to learn together through access to common pre-school provisions, schools and community educational settings with an appropriate network of support services. It aims at all stakeholders in the system such as learners, parents, teachers, community, administrators and policy makers to be comfortable with diversity and see it as a challenge rather than a problem. To be inclusive in education means that all students in a school, regardless of their strengths or weaknesses in any area, become part of the school community. It is an attempt to meet the unique needs of every child in a regular school setting. All children, despite of their disability, try to participate in all facets of school life. They are included in the feeling of belongingness with other students, teachers and support staff. Inclusion is the provision of services to students with disabilities in their neighbourhood schools with necessary support services and supplementary aids for both children and teachers. It means meeting the needs of children with disabilities for a free and quality public education in the least restrictive and most effective environment. One of the major goals of inclusion is to prepare students to participate as full and contributing members of society. Looking from a different perspective, inclusion does not mean 'dumping'. Rather, it gives a message, "everyone belongs to school and everyone is welcome to the school".

The National Curriculum Framework 2005, states that a policy of inclusion needs to be implemented in all schools and throughout our education systems. The participation of all children needs to be ensured in all spheres of their life in and outside the school. The NCF 2005 says:

- Inclusive education is about embracing all.
- Disability is a social responsibility accept it.
- No selection procedures to be adopted for denying admission to learners with disabilities.
- Children do not fail, they only indicate failure of the school.
- Accept difference.... celebrate diversity.

- Inclusion is not confined to the disabled. It also means non-exclusion.
- Learn human rights... conquer human wrongs.
- Handicap is a social construct, deconstruct handicap.
- Make provision—not restriction; adjust to the needs of the child.
- Remove physical, social and attitudinal barriers.
- Partnership is our strength such as
  School- community;
  school- teachers;
  teachers- teachers;
  teachers-children;
  children-children;
  teachers-parents;
  school systems and
  outside systems.
- All good practices of teaching are practices of inclusion
- Learning together is beneficial for every child.
- Support services are essential services.
- If you want to teach, learn from the child.
- Identify strengths not limitations.
- Inculcate mutual respect and inter-dependence.

Inclusive education is the need of the hour keeping in view the population explosion and availability of limited resources to meet out educational and other demands of all members of population. Under the programme of Sarva Shiksha Abhiyan (SSA) for realising the goal of universalisation of elementary education (UEE), inclusive education has been given a special place. Inclusion is not a new label for mainstreaming or integration, rather, it is related but different from the movement to integrate or mainstream students with disabilities into their regular neighbourhood schools. Keeping in view recent initiatives on inclusive education, a comprehensive review is necessary to help in better understanding the present status of education of children with disabilities, and how inclusive education can be promoted for a better future. A brief review of research studies undertaken in the area of inclusive education is provided below:

In a research study by Larrivee (1985) carried out on 118 primary school teachers in inclusive classrooms, it was reported that students with special needs demonstrated a greater level of achievement in the mainstream classrooms when the teacher used the time efficiently, his or her relationship with students was cordial, responded to all students positively and gave the students, a positive feedback. Jangira (1985) concluded that most developing countries visualised integrated education as an expedient measure to reinforce efforts to improve access to schools as a part of universalisation of basic education. Faselbhoy (1989) had reported lower cost of integrated education against special education for children with visual impairment because there is no investment in building, no maintenance of hostel etc. On the other hand, Advani (1990) expressed contradictory views and stated that in the Indian context, integrated education is not much cost effective as it is considered. Panda (1991) conducted a

study on the attitude of parents and community members towards disabled children and revealed that attitude depends upon sex of the people and type of disability among the children. It was reported by Banerji and Dailey (1995) that students with specific learning disabilities demonstrated academic progress at pace comparable to that of the students without such disabilities. In addition, teachers and parents of disabled children indicated progress in self-esteem and motivation level of children. Ahuja (1996) conducted a study entitled "Moving towards inclusive education: an innovative teacher training experiment". The study showed positive significant results in terms of changing the motivational level of the heads of the institution, classroom practices and attitude of students towards learning. The sampled teachers developed better training capabilities and understanding of pupils' learning styles and needs. The teachers further expressed their willingness to continue to work on inclusive education modules in day-to-day practice. It was remarked by Punani (1996) that integrated education enhances social integration and social acceptance of the students with visual impairments. It was further held that integrated education cannot be successful without active participation of parents, general educators and school administrators. Integrated education encourages the family to feel and assume its responsibility towards the child instead of shifting it largely to the institution. Shevde (1997) undertook a feasibility study of models of inclusive education and revealed that effect of inclusion, if initiated without the support system would increase the workload of regular school teachers. Parental resistance was marked as a strong factor among the barriers to inclusive education and hence, it was recommended to increase the parental involvement in inclusive education. Julka (1998) was of the view that if inclusive education is to be the focus of educational policy in near future, the reciprocal role of regular and special teachers is crucial. Parents need to be counselled before the children are integrated in mainstream schools. Cook (2001) and Sharma (2002) inferred that teachers' attitude towards disabled children depend on the nature, type and degree of disability among the children. It was pointed out by Zaveri (2001) that teachers considered 'inclusion' as desirable but not feasible on account of large class sise, vast and rigid curriculum content, lack of training and awareness to deal with disabled students. Soni (2004) revealed that the facilities for education of children with disabilities were in initial stage in Himachal Pradesh as well as Madhya Pradesh and were non-existing in Meghalaya and Mizoram. In all four states, the teaching-learning strategies being used in the classrooms did not meet the specific needs of different categories of disabled children due to inadequate training of teachers in the areas of inclusive education. Nayak (2008) concluded that parents of disabled children have actual interest in inclusive education and they wanted their children to get education along with normal children. She also revealed that teachers look forward to teach in an inclusive environment and were ready to face the future challenges. On the

contrary, Smitha and Acharya (2010) had reported that teachers possessed unfavourable attitude towards inclusive education. With regard to the factors affecting teachers' attitude towards inclusive education, it was pointed out by Sharma (2010) that gender, educational qualifications, teaching experience and location of schools did not affect attitude of primary school teachers' attitude towards inclusive education.

The review of aforementioned studies provides conflicting conclusions and one can not arrive at a generalised idea or a consensus. But, the significance and vitality of inclusive education in present social and educational scenario can not be under estimated. The success of inclusive education depends on collaborative efforts of government authorities, parents, school administrators and school teachers. The prime factor in success of inclusive education is the commitment and attitude of school teachers 'the real field workers' towards special children who are to be imparted education in inclusive settings. Hence, it was considered worthwhile to ascertain the views and perception of school teachers regarding various aspects of inclusive education and problems encountered by them in applying the principles of inclusive education in normal classroom situations. The suggestions forwarded by the teachers will act as a benchmark for educational administrators, policy planners, curriculum framers and all other concerned in bringing necessary changes and modifications related to different dimensions of inclusive education.

Objectives of the present study:

1. To construct and standardise a scale for teachers to measure their attitude towards inclusive education.
2. To study views and perception of elementary school teachers regarding different aspects of inclusive education.
3. To identify the major problems faced by elementary school teachers in imparting education to the children through inclusive means.
4. To suggest intervention for improving implementation of inclusive education in normal educational settings.

Methodology

Survey technique under 'Descriptive Method of Research' was employed to develop attitude scale as well as to study the views and perception of elementary school teachers regarding various aspects of inclusive education.

Sampling

In the present investigation, a total of 200 elementary school teachers were selected from 35 primary and 22 upper primary schools of Kullu and Kangra district of Himachal Pradesh. For this, purposive sampling technique was adopted as it was not possible to employ probability sampling techniques due to non-availability of complete list of elementary school teachers.

Research Tools Developed

1. Scale for Teachers' Attitude towards Inclusive Education:

For ascertaining the views and perception of elementary school teachers regarding

different aspects of inclusive education, an attitude scale was developed and standardised by the investigators. The preliminary draft of attitude scale was comprised of 64 items (in Hindi language) which were to be rated on a three point scale i.e. agree, neutral, disagree. The statements of opinions were collected by carrying out discussions with field experts and reviewing the literature available in the area of inclusive education and special education. The items were critically discussed with field experts in regard to their technical accuracy, relevance and coverage. The assistance of language experts was also sought to remove any sort of linguistic ambiguity in the items. Thus, after undertaking initial modifications and editing, the preliminary draft was administered on 250 elementary school teachers for carrying out item analysis of attitude scale. After carrying out item analysis on the basis of responses in respect of upper 27 per cent and bottom 27 per cent groups of teachers, only highly discriminating items/statements (having t-value equal to or greater than 1.75) were retained in the final draft of attitude scale. On the basis of this, a total of 17 items were rejected and thus, the final draft of attitude scale was comprised of 47 items. The distribution of selected 47 items in four aspects of inclusive education was as under:

(i)	Psychological Aspect	10
(ii)	Social and Parents-Related Aspect	12
(iii)	Curricular and Co-curricular Aspect	13
(iv)	Administrative Aspect	12

The reliability of the scale was ascertained through test-retest method that came out to be 0.82 which was fairly high index of stability. In addition to this, internal consistency of attitude scale was also established by computing correlation coefficients between total score on complete attitude scale and separate scores on each of four aspects of attitude towards inclusive education. Apart from this, content validity of the scale was reported high by the field experts consulted at the time of developing preliminary draft of attitude scale. Cross validity of the scale was ensured by selecting different sample of elementary teachers for carrying out item analysis, computing reliability and final data for achieving the objectives of present study.

2. Questionnaire for Elementary School Teachers

Apart from attitude scale for elementary school teachers, a questionnaire was also developed to identify the problems faced by teachers in imparting education through inclusive means in normal classroom situations. This questionnaire was comprised of six items which were of both close-ended as well as open-ended nature. The validity of questionnaire was ascertained by seeking critical comments and suggestions from DIET faculty members, experienced school heads and teachers and teacher educators. The comments and suggestions offered by the experts were taken into consideration to give a final shape to the questionnaire.

Analysis of Data

The data obtained through attitude scale were analysed with the help of percentage analysis. In addition, the technique

of 'content analysis' was employed to analyse responses of elementary school teachers to open-ended questions provided in the questionnaire.

Discussion of Findings

After computing percentage for each of three categories of responses (i.e. agree, neutral and disagree) to all items of attitude scale, the interpretation of results was carried out separately for four aspects of attitude towards inclusive education. On the basis of this, the views of teachers regarding different aspects of attitude towards inclusive education were extracted out which are presented ahead:

1. Teachers' Opinion regarding Psychological/Behavioural Aspects of Inclusive Education

Almost all elementary teachers (more than 90 per cent) reflected that inclusive education is the demand of present social and educational scenario and through such type of education; special children can be brought into the mainstream of society. It was indicated by 61 per cent elementary school teachers that inclusive education helps in enhancing self-confidence level of special children. With regard to effect of inclusive education on other psychological and behavioural characteristics of students, it was perceived by elementary school teachers that inclusive education; helps in full development of abilities of special children (63 per cent), develops positive social attitude among special children (67 per cent) and has a positive impact on educational development of special children (58 per cent). Similarly, elementary school teachers reflected their disagreement with regard to the ideas that inclusive education does not help in intellectual development of special children (54 per cent) and it negatively affects educational development of normal children (59 per cent). Furthermore, about three fourth of sampled teachers each were of the opinion that while imparting education in inclusive settings, neither the normal children are neglected nor there is any detrimental effect on their learning capabilities. In addition, 54 per cent teachers revealed that in inclusive settings, there is no pressure on special children to perform similar to their normal counterparts present in their class.

2. Teachers' Perception regarding Social Aspects of Inclusive Education

With respect to teachers' attitude towards social and parents-related aspect of inclusive education, it was viewed by elementary school teachers that inclusive education; helps in providing equal social rights to special children (84 per cent); a better option for special children in comparison to special education (62 per cent); helpful in social adjustment of special children (52 per cent); helpful to improve national literacy rate (82 per cent) and; also helpful for getting full cooperation/contribution from special children in social reconstruction and development (62 per cent). However, 65 per cent of teachers pointed out such parents of special children that were not comfortable in sending their child for receiving education in inclusive settings and the number of problems that they face during the whole period of education of their child in the schools. Hence, it

was suggested by 68 per cent of teachers that for successful implementation of providing education in inclusive situations, it is very essential to receive willingness and cooperation of parents of both special as well as normal children.

3. *Teachers' Opinion regarding Curricular and Co-Curricular Aspects of Inclusive Education*

It was revealed that for implementation of inclusive education in normal schools, the teachers at present are mentally and emotionally ready (51 per cent) and about three fourth (74 per cent) of teachers perceived that teachers need to be well aware about various needs of special children in order to impart education in inclusive settings. Further, it was opined by about two third teachers (64 per cent) that inclusive education should be comprised of appropriate co-curricular activities along with curricular activities so that the needs of both special children as well as normal children can be easily satisfied in normal schools. It has been revealed that teachers are comfortable with special children (60 per cent) in normal classrooms and for imparting education in inclusive settings more effectively, it was perceived that they need to employ different teaching-learning strategies to provide varied learning experiences to students with differing characteristics (66 per cent). Majority of teachers (52 per cent) held that they had to face problems as well as an extra burden is levied upon them at the time of imparting education to children in inclusive settings. It was pointed out by 58 per cent teachers that it is not possible for them to cover the syllabus in schools on account of use of inclusive education strategies in classroom situations. It was suggested by 70 per cent teachers that they need to improve their professional qualifications for better execution of inclusive education strategies in normal classroom situations.

4. *Teachers' Opinion regarding Administrative Aspects of Inclusive Education*

About two third (67 per cent) elementary school teachers were of the view that present school curriculum is not according to the needs of special children. In addition, for making inclusive education successful in present scenario, elementary school teachers reflected that; there is a need to make normal schools more appropriate for special children (56 per cent), need for making present education system more flexible (60 per cent), need for providing intensive in-service training to teachers (72 per cent) and government should undertake financial and policy reforms for better execution of inclusive education in normal schools (58 per cent). Apart from this, elementary school teachers agreed that for imparting education through inclusive means, teachers serving in normal schools should be provided special training (68 per cent). It was opined by 58 per cent elementary teachers that it is a great challenge to impart education through inclusive means because adequate facilities are not available in normal schools.

5. *Major Problems faced by Elementary Teachers in Imparting Education in Inclusive Settings*

Although, it has been reflected by

majority of elementary school teachers that inclusive education is a better alternate for educating special children as compared to special education, but certain problems are faced by them in imparting education through inclusive means in an effective manner. It was pointed out that normal schools are lacking in basic facilities which are pre-requisite for effective implementation of inclusive education in general school situations. It hampers complete development of special children and their needs can not be completely fulfilled in normal schools. The unavailability of special teachers/resource teachers/ well trained teachers, equipments and specific teaching-learning materials in normal schools were perceived as major hindrances for effective execution of inclusive education. Lack of in-service training to teachers serving in normal schools has also been considered as a problem by 68 per cent elementary teachers due to which they are unable to understand the problems and needs of special children. The other major problems as forwarded by elementary school teachers included; (i) not enough scope in present curriculum for educating special children (34 per cent), (ii) less number of teaching staff in normal schools (48 per cent), (iii) unfavourable attitude of parents of normal children towards needs of special children (28 per cent), (iv) engagement of teachers in non-academic tasks like census, elections etc. (45 per cent) and,(v) difficulties in establishing and maintaining good relationship between normal children and special children in same classroom or school.

6. Suggestions for Improving the Status of Inclusive Education

It has been visualised by elementary school teachers that for improving the status of inclusive education and making it more acceptable to all sections of society, the need is to sensitise the working school teachers about fundamentals of inclusive education and needs and problems of special children. For this, it was recommended that teachers serving in normal schools should be provided intensive and extensive training through seminars, workshops, refresher courses etc. In this regard, DIETs, BRCs and CRCs should come forward with specifically devised and designed programmes for imparting training to teachers. The training programmes for teachers should be made more need-based and student-oriented. It was reflected by teachers that they should be oriented about various teaching-learning strategies for educating children in inclusive settings. Furthermore, the teachers of general schools and special schools should come on a common platform to share their experiences about characteristics, needs and problems of different kinds of children. This will help both in making a barrier free and congenial environment for imparting education to all children of varying abilities. Educational authorities and administrators should initiate to devise such schemes and programmes for bringing general teachers and special teachers on a sharing platform. In addition to this, for sensitising parents about the concept and nature of inclusive education, parents-teacher associations (PTAs) and mother-teacher

associations (MTAs) at elementary stage can play an effective role. In addition, village education committees/school management committees constituted under Sarva Shiksha Abhiyan (SSA) can provide effective leadership in bringing awareness among community members regarding usefulness of inclusive education not only for the betterment of special children but also for upliftment of society. For making inclusive education effective and successful, the cooperation and assistance of non-governmental organisations (NGOs) can be received in generating awareness among the community members. The colleges of education can play an effective role in providing training to school teachers and developing teaching-learning material for special children. The government authorities should appoint additional teachers in schools so that teachers can pay full attention to the needs and problems of all children in the schools. Adequate as well as appropriate infrastructural facilities and a barrier free environment should be provided in schools to make inclusive education, a successful venture. The requisite curriculum changes or modifications can be undertaken by the concerned authorities for making curriculum in accordance with the blended needs of normal children as well as special children. The curriculum should have enough scope for employing various teaching-learning strategies by teachers as well as use of different teaching-learning equipments and materials for imparting varied kinds of learning experiences to the children. A special teacher and a resource room must be made compulsorily available in every school so as to resolve the problems of special children. Apart from this, on an extreme, the government may consider an alternative system with more openness and flexibilities to accommodate learners with disabilities. In such a system, special children should be allowed to choose the curriculum and there should be a flexible teaching and evaluating mechanism so that mainstreaming does not stop at mere physical inclusion of child in the class but actively foster his/her learning potential.

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Psychological Stress in Relation to Achievement among Male and Female Science Students

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Abstract

This study attempts to assess the psychological stress among male and female senior secondary science students in relation to achievement. A sample of 631 (419 male and 212 female) senior secondary science students was randomly selected from different types of institutions of Meerut district. They were administered Psychological Stress Scale for Science Students developed by researchers themselves which measures 12 dimensions of psychological stress. Results showed that both male and female science students significantly differed on psychological stress and achievement. There was also significant relationship between psychological stress and achievement of male and female science students.

Introduction

The present scenario is coming up with technological revolution, web technology and web culture. Naturally it is the achievement of people especially in the field of science besides humanities. It is well considered opinion proven rationally that science and technology has great potential for the development of a country. Hence science education in every country occupies a significant place in education right from the beginning. The very structured knowledge in science education demands good intellect people with scientific attitude and rational mind. Even very intelligent students find science comparatively a difficult subject of study as compared to humanities. Difficulty in understanding of science experienced by students in general, fear of science and underachievement in science subjects are the common problems due to which students suffer. Science also exerts a number of additional demands on students. The science curriculum requires enormous commitment and hard work by students. The intense curriculum may produce stress on science student's life. The school setup, teacher's expectations,

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infrastructure facilities, modalities of teaching etc. promote the feeling of pressure associated with being in the science stream. Most of the time, science students complain of dwelling in between their efforts for better achievement and teacher's/parent's expectations. Even after investing time and efforts they find it difficult to learn science and get easily stressed. The transition from one programme to another has been reported to result in increased stress levels for students (Beck, Hackett, Srivastava, McKim, & Rockwell, 1997). It is being experienced by parents and teachers in schools that science students suffer from psychological stress which influence their achievement.

For preparing students for their future roles in science, it is important to identify stressful factors that may affect their successful development. Most of the studies in different responses to stress have been carried out on dental, medical, nursing, university and college students (Supe1998, Grannis 1992, Jones 1996, Helmers, et al.1997, Dill and Henley 1998, Sinha et al. 2000, Kuruppuarachchi et al. 2002, Clarke, V. A. and Ruffin, C. L.1992, Gupchup, G.V. et al. 2004, Polychronopoulou, Argy and Divaris, Kimon 2005). Lazarus and Folkman (1984) describe stress as a specific stimulus-response transaction, which threatens an individual. One study identified the major academic stressors among college students as tests, grade competition, time demands, professors and classroom environment, and career and future success (Murphy & Archer, 1996). Another study reported that stress may be associated with the type of institution the student attends (e.g., public, private, undergraduate, graduate professional (Hudd et al., 2000). Misra, et al., (2000) found that academic stress among college students varies across year in school and gender. Specifically, freshmen and sophomores had higher academic stress levels than juniors and seniors, and females reported higher academic stress than males. There were not many researches that studied the stress among science students at senior secondary level in Indian context emphasising gender differences.

Objectives

1. To study the relationship between psychological stress and achievement of male and female science students.
2. To study the difference between male and female science students on psychological stress.

Hypotheses

1. There is no significant difference between male and female science students on psychological stress.
2. There is no significant relationship between psychological stress and achievement of male science students.
3. There is no significant relationship between psychological stress and achievement of female science students.

Method

Descriptive survey method has been used to conduct the present study.

Sample

In this study, science students enrolled in 12th standard were taken from seven types of institutions running in Meerut

district. Using simple random sampling, 100 science students were selected from each type of school, thus constituting a sample of 700 students in all. Out of 700 science students only 631(419 male and 212 female) students were finally taken because 69 students did not fill the scale properly.

Materials and Procedure

To achieve objectives of this study Psychological Stress Scale for Science Students (PSSSS) developed by the researchers was used to measure psychological stress of science students. It was structured around 12 dimensions of psychological stress i.e. curriculum transaction in science, content of science, infrastructure for science, science teachers, peers, workload in science, examination and achievements, home and family environment, vocational aspiration, health, communication problems and society. Thus, PSSSS is a 96 items scale with a Likert type response format (5= Always, 4= often, 3= sometimes, 2= rarely, and 1= never). Reliability of the scale was determined by split-half method and was found 0.96. Achievement in science of the students was considered as the marks obtained in science in 12th class board examination.

Results

To find out the significance of difference between male and female science students on psychological stress and their achievement, t-test was used. To find out the relationship between psychological stress and achievement of male and female science students, Pearson product moment correlation coefficients were calculated. Results are presented in Table1-4 respectively.

TABLE 1
Summary of t-test for difference between male and female science students on total psychological stress and its all dimensions

Dimensions of Psychological Stress	*Male (N = 419)*		*Female (N = 212)*		*t-value*
	Mean	*S. D.*	*Mean*	*S. D.*	
Curriculum Transaction in Science	23.66	5.89	22.02	5.86	3.30**
Content of science	21.13	5.93	20.21	5.88	1.85
Infrastructure for Science	22.59	7.77	20.03	8.41	3.79**
Teachers	24.86	7.04	22.79	8.84	3.19**
Peers	21.88	6.65	19.83	6.27	3.70**
Workload in Science	22.37	6.82	21.72	6.62	1.13
Examination and Achievement	24.86	6.45	24.43	6.98	0.76
Home and Family Environment	22.11	7.03	20.02	7.58	3.42**
Vocational Aspiration	23.88	6.73	22.11	7.11	3.05**
Health	20.53	8.03	17.68	7.52	4.30**
Communication Problem	21.65	6.85	18.28	6.41	5.96**
Society	21.11	7.22	18.49	6.73	4.41**
Total psychological Stress	270.63	56.94	247.63	58.67	4.74**

Note: ** Significant at 0.01 level

It is evident from Table-1 that t-values between the means of male and female science students on psychological stress dimensions-curriculum transaction science, infrastructure for science, science teachers, peers, home and family environment, vocational aspiration, health, communication problems, society and total psychological stress were found to be significant at 0.01 level. This reveals the fact that male and female science students differed significantly on total psychological stress and its dimensions curriculum transaction in science, infrastructure for science, science teachers, peers, home and family environment, vocational aspiration, health, communication problems, society. Since mean differences were in favour of male students, it indicates that male science students were found to be more stressed than female students. However, no significant difference was observed between means of male and female science students on psychological stress dimensions-content of science, workload in science, and examination and achievement as the concerned t-values not significant at 0.05 level.

TABLE 2
Summary of t-test for difference between male and female science students on achievement

Sex	*N*	*Mean*	*S. D.*	*t-value*
Male	419	114.31	27.86	4.43**
Female	212	124.07	22.26	

** Significant at .01 level

Table 2 summarises that t- value between the means of male and female science students on achievement was found to be 4.43 which was significant at 0.01 level. It leads to the inference that male and female science students differ significantly on achievement. Since the mean of female students was higher than male students (M=124.07>114.31), it might be said that female science students had better achievement than male science students.

TABLE 3
Correlation between psychological stress and achievement of male science students (N = 419)

Variables	*Mean*	*S.D.*	*Product*	*Correlation*
Achievement	114.305	27.864	------	------
Total Psychological Stress	270.148	56.661	12747212	-0.289**
Curriculum Transaction in Science	23.556	5.610	1115709	-0.191**
Content of Science	21.055	5.739	989098	-0.288**
Infrastructure for Science	22.473	7.306	1060517	-0.185**
Science Teachers	24.862	7.042	1185745	-0.061
Peers	21.876	6.653	1028184	-0.252**
Workload in Science	22.368	6.821	1055670	-0.196**
Examination and Achievement	24.859	6.446	1171139	-0.259**
Home and Family Environment	22.105	7.033	1042480	-0.198**
Vocational Aspiration	23.883	6.735	1125825	-0.229**
Health	20.437	7.628	955899	-0.257**
Communication Problems	21.649	6.850	1018580	-0.229**
Society	21.026	6.853	998366	-0.108*

** Significant at 0.01 level

It is revealed from Table-3 that achievement of male science students was negatively and significantly correlated with total psychological stress and its dimensions viz- curriculum transaction in science, content of science, infrastructure for science, peers, workload in science, examination and achievement, home and family environment, vocational aspiration, health and communication problems at 0.01 level and with society dimension at 0.05 level. But it was not significantly correlated with science teachers.

Table-4 clearly shows that achievement of female science students was negatively and significantly correlated with total psychological stress and its dimensions viz- content of science, workload in science, examination and achievement and vocational aspiration at 0.01 level. Negative and significant correlation was also found for psychological stress of female students with dimensions viz peers, home and family environment and communication problems at 0.05 level. But it was not significantly correlated with curriculum transaction in science, infrastructure for science, science teachers, health and society. It means that achievement of female science students is significantly and inversely correlated with total psychological stress and its dimensions viz- content of science, peers, workload in science, examination and achievement, home and family environment, vocational aspiration and communication problems.

Implications of the Study

The findings of the present study may be utilised by educational planners and administrators and teachers in order to assess and modify their schemes and teaching methodologies pertaining to the development of science students.

TABLE 4

Correlation between psychological stress and achievement of male science students (N = 212)

Variables	*Mean*	*S.D.*	*Product*	*Correlation*
Achievement	124.071	22.260	------	------
Total Psychological Stress	246.986	58.108	6432672	-0.233**
Curriculum Transaction in Science	22.024	5.863	575962	-0.120
Content of Science	20.208	5.881	523641	-0.284**
Infrastructure for Science	19.863	8.142	517872	-0.119
Science Teachers	22.509	7.620	587367	-0.131
Peers	19.835	6.274	517306	-0.149*
Workload in Science	21.722	6.617	564768	-0.211**
Examination and Achievement	24.434	6.985	634809	-0.239**
Home and Family Environment	20.019	7.580	520360	-0.173*
Vocational Aspiration	22.113	7.112	575089	-0.195**
Health	17.495	6.986	455761	-0.134
Communication Problems	18.278	6.410	476162	-0.152*
Society	18.486	6.726	483575	-0.084

** Significant at 0.01 level

1. The present study concludes that care and consideration of the effects of stress among science students should be given by faculties and curriculum designers, and in addition, that stress awareness and the learning of coping strategies should be an integral part of the educational programme.
2. The findings of the study may be of immense interest for teachers, headmasters and principals to re-orient their efforts to help the students. They should be involved in designing the various tasks.
3. The findings of this study may be useful to the persons those are involved to asses the impact of the workload on students welfare and to prepare students for challenges in their life.
4. The findings of this study may also be useful for parents because parents often feel stressed and frustrated too, but they must realise that the brains of teens are physically different from adults, they don't see things in the same way and they react differently. Parents can help enormously by setting a good example, being patient, spending time with students and listing to them.
5. It is believed that the findings of this study will provide valuable data and information which may come handy to School Counselors when assisting science students in charting what best ways or techniques to adopt in coping, adapting and managing study.
6. The study will give an impetus to research in education and would encourage the young researchers to think in the new direction of the problem and to undertake further research in the area on newer dimensions relating to science education.

Conclusion

The findings obtained on account of the differences between male and female science students disclosed that male science students have more psychological stress on almost all the dimensions of psychological stress. The reasons may be forwarded by temperament male students are inherently more negligent, they generally have more outward activities, yet quite concerned about their performance, consequently suffer with more psychological stress. Female students on the other hand are generally more regular to their studies, generally remain confined to home and then give more time to their study, hence feel less stressed. The findings of the present study are not supported by the results of the studies of Stone (1986), Archer et al. (1991), and Polus-Sseniawsaka and Kocanda (1988), Siddiqui (1983), Eunsook Hong (1998) Mishra and Mckean (2000), Hudd et al. (2000) because they found that female students reported higher level of stress than male students. While some researchers like Gupta (1979), Clarke and Ruffin (1992), Supe (1998), Rosalind Murray-Harvey et al. (1999), Lee et al. (2002) found no significant difference between male and female science students on stress. Polychronopolou and Divaris (2005) found gender differences in most of the perceived stressors. Male

and female science students were also found to be differed significantly on achievement. Female science students had better achievement than male science students. Achievement of both male and female science students was negatively and significantly correlated with total psychological stress and some of its dimensions. These finding are not supported by the findings of the studies of Kasem (1973) and Soliman (1979), Jones (1996), as they found insignificant relationship between achievement and anxiety of female science students.

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Attitude Towards Mathematics as Correlate of Achievement in Mathematics

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Abstract

Attitude towards mathematics has its bearing on mathematical creativity, achievement in mathematics. Favourable attitude influences achievement, personality, perception and success. In the present study the researchers have tried to establish a relationship between attitude towards mathematics and achievement in mathematics. In the present study 500 higher secondary school students of Patna district have been selected randomly as sample of the study. For the measurement of attitude towards mathematic, the scale developed and standardised by Lalit Kumar has been employed. Achievement of students in maths in their secondary board examination has been taken as their achievement in mathematics. For testing the hypotheses percentage, mean, standard deviation, t-value, coefficient of correlation have been calculated. The study has major findings as — (i) More than 50 per cent higher secondary school students possess favourable attitude towards mathematics, (ii) Attitude towards mathematics is significantly correlated with achievement in mathematics and (iii) Higher group on attitude towards mathematics is significantly superior in their achievement in mathematics in compariosn to lower group on attitude towards mathematics.

Attitude is one of the most important concept in Psychology. Many studies have been conducted on attitude in Education and Psychology. Attitude has its bearing on different aspects of learning. Focusing on the need of Attitudinal Learning essential for social welfare has clearly mentioned the importance of attitude, "Inculcation of scientific temper, scientific attitude, feeling of dedication and social harmony is possible only when our education system focuses on attitudinal learning. Creating favourable attitude towards social welfare and social service is one of the vital aims of education and it becomes even more important in this age of crisis where individuals are growing and systems are collapsing." Attitude measurement is a central concern in social psychology and also in education. In fact, attitude plays a prominent and significant role in shaping the behaviour and so its measurement is a very important concept of study in Psychology and Education. A complete

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picture of man's attitude towards various aspects of his social world yields highly reliable predictions about his behaviour in various social situations and that is why study of attitude is the major concern of Psychology and Education.

Mathematics is considered as one of the important subject of study and that is why its study has been made compulsory upto secondary level. The faculty theory of Psychology and the theory of mental discipline of Transfer of Training tell about the importance of Mathematics for training the mind and behaviour. Napolean said that the development of a society is related to the development of the mathematics in the society concerned. Due to its utilitarian, disciplinary, vocational, intellectual and other values, it has become even more important in this scientific age.

From a lay man to a scientist – every one is making use of mathematics in their daily life. Besides being an independent subject of study, it has application in almost all other subjects. We may say that mathematics is a mental tool for training and exercise of intellectual functions. Due to its unique role in solving every day problems of human life, it has occupied a prominent position in school curriculum all over the world.

The key to man's success is the process of being aware. Awareness is an innate potential of man. It is a process essential to life. The human knows and does he continue to survive. Thus, we find that it is the acquisition of knowledge and skills that allow a man to survive. In other words, it is the achievement in various fields that produces an effective individual in the society. Morgan and King define achievement as an accomplishment on a test of knowledge or skill.

For the proper development of mathematics education the attitude of students towards mathematics and their achievement in mathematics must be taken into account. Attitude is a condition of readiness for a certain type of activity. Achievement is the status of level of a person's learning and his ability to apply what he has learned. The effectiveness of any educational system is judged by the extent how pupils are involved in the system and achieve in the cognitive, affective and psychomotor domain.

It has been indicated by researches that a number of variables such as personality, attitude, socio-economic status, the organisational climate of the school and curriculum affect the achievement. Lalit Kumar has rightly explained the importance of attitude in the teaching and evaluation, "Attitude is an important psychological concept and affects the individual's behaviour. Favourable attitude has its bearing on all the aspects of human behaviour. It influences an individual's choice of action, achievement and personality. Unfavourable attitude towards the subject and its evaluation affects the teaching and learning process. Therefore, it should be the prime concern of teacher educators and policy makers to make the learner's attitude favourable towards the subject and also towards its evaluation." These variables are generally referred the as correlates of achievement. In schools, great emphasis is placed on achievement right from the beginning. The student is trained to accept a hierarchy based on achievement.

Several works have been done to know the relationship between two or more than two traits of human personality such as relationship between intelligence and achievement, motivation and achievement, etc. Here, the researcher is trying to know the relationship between "Attitude Towards Mathematics" and "Achievement in Mathematics". Since both the traits, i.e. Attitude Towards Mathematics and Achievement in Mathematics have greater importance in mathematics education and so to examine the relationship between these two traits of human personality is a relevant and much needed study. Sahu, L P and Sood R. have established relationship between attitude, perception and academic achievement, "(1) A significant relationship was found between students' perception of teachers attitude towards them and their academic achievement (2) A relationship was found between students perception of teachers attitude towards them and their self perceptions (3) A significant relationship was found between the academic achievement of students and their self perception."

Various studies reflect that favourable attitude towards mathematics predict about the success of the students in mathematics, few studies convey that attitude towards mathematics is related to the achievement in mathematics and so the researchers have undertaken the study to find a relationship between attitude towards mathematics and achievement in mathematics with the objectives that the finding will direct and help the mathematics teachers, researchers, teacher-educators, policy-makers to serve mathematics teaching and learning more properly and scientifically.

Lalit Kumar and Sudhir Kumar while writing on status of attitude researches have concluded that maximum work has been done to survey the opinions of teachers and students related to academic and Psycho-social phenomena. He writes, "Attitude researchers started with the explorations of the nature and structure of attitudes, development of the methods of attitude measurement, and identification of the correlates of attitudes. Influence of attitudes on such psychological processes as learning and remembering, perception and thinking and reasoning has also been investigated in some detail. Maximum work has been done in connection with the survey of attitudes and opinions of various groups of people towards all kinds of social, political, cultural and economic issues that the country is facing. A major bulk of research has been done in area of education – on attitudes of teachers and students towards various academic and psycho-social phenomenon."

Many researchers are of the opinion that attitude towards science is a significant predicator of academic achievement for some level of science students. Academic achievement in mathematics is thus functionally dependent on attitude of the students towards learning mathematics. Pal observed that better attitude towards mathematics ensures better achievement of the students in mathematics at secondary level. Jayraman, V found a significant relation between attitude towards learning mathematics and achievement in mathematics. Lalit Kumar found that attitude towards

mathematics plays a significant role in the development of mathematical creativity. He found insignificant difference between the attitude of male and female students towards mathematics. He concluded that a few primary school teachers possess high favourable attitude towards mathematics.

Lalit Kumar found that attitude towards mathematics is positively and significantly correlated with achievement in mathematics. He also found that high attitude towards mathematics group is significantly superior in achievement in mathematics in comparison to the low attitude towards mathematics group. S. Saha conducted a research study to indicate that the component attitude, in favourable direction of learning mathematics, is a significant contributor to the success in the mathematical achievements of both boys and girls. It explains that predisposition to learn mathematics and psychological readiness to carry the stress of solving problems seem essential for achieving success. In the light of above mentioned studies and some other related studies the researchers have undertaken the study to examine relationship between attitude towards mathematics and achievement in mathematics.

Objectives

(1) To find out whether the Higher Secondary School students possess favourable Attitude towards Mathematics.
(2) To establish the relationship between Attitude towards Mathematics and Achievement in Mathematics.
(3) To compare the Mathematics Achievement Scores of High and Low Attitude Towards Mathematics groups.

Hypotheses

(1) The Higher Secondary School students do not possess favourable Attitude towards Mathematics.
(2) There is no significant relationship between Attitude Towards Mathematics and Achievement in Mathematics.
(3) There is no significant difference in the Mathematics Achievement of High and Low Attitude Towards Mathematics groups.

Methodology

In the present study the researchers have employed Descriptive Survey Method to study the relationship between Attitude Towards Mathematics and Achievement in Mathematics.

Sample

In the present study five hundred (500) Higher Secondary School students of Patna district (Class XIth students only) have been selected randomly as sample of the study.

Tool Used

To measure the Achievement in Mathematics the marks obtained in Mathematics by the students in the Secondary Board Examination has been considered.

Attitude Towards Mathematics Scale developed and standardised by Kumar, Lalit has been used to measure Attitude of students towards mathematics. It is a bilingual scale (English and Hindi)

and contains twenty four (24) items related to mathematics. This Likert type attitude scale has five alternatives as Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree. The scale has separate response sheet coded as 1, 2, 3, 4 and 5 before each item for Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree respectively. For each individual item coded on the answer sheet, the students have to respond by encircling the alternative that looks to him/her the appropriate one.

The inventory has four dimensions – Utilitarian value, Social value, Aesthetic value and Intellectual value. There are three positively worded and three negatively worded items for each dimension. In this way, out of twenty four items – twelve items are positively worded whereas twelve items are negatively worded. Items 1, 5, 9, 13, 17 and 21 are from Utilitarian value dimension, whereas items 2, 6, 10, 14, 18 and 22 are from Social value dimension. Items – 3, 7, 11, 15, 19 and 23 are from Aesthetic value dimension and items 4, 8, 12, 16, 20 and 24 are from Intellectual value dimension.

Scoring of the response is as 0, 1, 2, 3 and 4 in the direction from Strongly Disagree for a positively worded item and for negatively worded item as 4, 3, 2, 1 and 0. Items – 1, 3, 6, 8, 10, 12, 13, 15, 17, 19, 22 and 24 are positively worded. Items – 2, 4, 5, 7, 9, 11, 14, 16, 18, 20, 21, 23 are negatively worded. Score consisting of sum of scores of all the four dimensions is the total score, i.e., score of an individual as Attitude Towards Mathematics. The dimension scores range from 0 to 24 whereas total score on Attitude inventory ranges from 0 to 96. The scale and its dimensions have high positive reliability coefficient ranging from 0.64 to 0.86. The scale also has optimum face and content validity. For this purpose opinion and suggestions of experts, teachers and teacher educators have been taken. The construct validity, a matrix of coefficient of correlation between the scores on four dimensions of Attitude Towards Mathematics scale and the total score on the scale, ranges from 0.43 to 0.87.

The selection of dimensions have been made on the basis of different values of mathematics teaching reflected and discussed in different mathematics teaching books. Utilitarian value is related to utility of mathematics as a subject while social value deals with social importance of the subject and its effect on social, civilisational and cultural development. Aesthetic dimension is all about beauty and enjoyment of subjects and Intellectual dimension is related to intellectual importance that mathematics possesses and helps to sharpen the intellect.

Definitions of the terms used in the study

(A) Attitude Towards Mathematics

Gagne and Briggs (1974) describe the attitude as an internal state which affects an individual's choice of action towards some object, person or event.

Keeping this definition into account, attitude towards mathematics may be defined as "Attitude towards mathematics is an internal state which affects an individual choice of action towards mathematical objects,

mathematical events or persons related to mathematics." More precisely, Attitude towards mathematics is a delimited totality of one's behaviour with respect to mathematics.

(B) Achievement in Mathematics

Achievement is a measure of performance or accomplishment to data (Wideman, 2002).

Achievement refers to the scholastic or academic success of the student at the end of an educational programme.

In the study mathematics score obtained by the students in their Secondary Board Examination has been considered as their achievement in mathematics.

(C) Favourable Attitude

The product of the number of statements and the numerical values assigned to the statement "Agree (for positively worded statement) or Disagree (for negatively worded statement)" has been considered as the minimum score for the consideration of favourable attitude. All the score below this score has been treated as unfavourable attitude score of an individual.

In this study product of 3 (value on statement) and 24 (number of statements) has been considered as the minimum score, i.e., 3x24 = 72. An individual bearing 18 and above on each dimension and 72 and above on composite score has been included in the group of students bearing favourable attitude.

Statistical Treatment of the Data

After scoring the responses for each student and about every statement, the score was tabulated and analysed for different dimensions separately. It was analysed for different individual item and also at composite score (sum of all the dimensions scores). It was decided that the favourable attitude score against an item is 03 and above, against a dimension is 18 and above and against the composite score is 72 and above.

Mean, Standard deviation, Percentage, Correlation coefficient (r) and t-value were calculated to verify the hypotheses.

20 per cent high scorers have been considered as Higher group and 20 per cent Low scorers have been considered as Lower group.

Analysis and Interpretation

TABLE I
Number and Percentage of Students Bearing Favourable Attitude Towards Mathematics

Attitude Dimensions	*Number*	*Percentage*
Utilitarian Value	259	51.80 %
Social Value	237	47.40 %
Intellectual Value	364	72.80 %
Aesthetic Value	251	50.20 %
Composite Attitude	261	52.20 %

Table – I reveals that 51.80 per cent, 72.80 per cent, 50.20 per cent and 52.20 per cent of the students have favourable attitude towards Utilitarian, Intellectual, Aesthetic and Composite dimensions of attitude towards mathematics respectively. It indicates that more than half of the students taken in the sample bear favourable attitude towards the aforesaid dimensions of attitude towards mathematics. However, only 47.40 per cent students show favourable attitude towards social dimension of attitude towards mathematics.

TABLE II
Product Moment Correlation (r) between Attitude Towards Mathematics and Achievement in Mathematics

Attitude Dimensions	*Achievement in Maths*	*N*	*Level of significance*
Utilitarian Value	0.20	500	0.01
Social Value	0.03	500	NS
Intellectual Value	0.30	500	0.01
Aesthetic Value	0.20	500	0.01
Composite Attitude	0.21	500	0.01

Table – II reveals that the correlation coefficient (r) between achievement in mathematics and attitude towards mathematics is 0.21. The correlation coefficient between achievement in mathematics and attitude dimensions – Utilitarian value, Social value, Intellectual value and Aesthetic value are 0.20, 0.03, 0.30 and 0.20 respectively. All these values are significant (except with Social value dimension) at 0.01 (df = 998) level of significance.

It indicates that Utilitarian value, Intellectual value and Aesthetic value of Attitude Towards Mathematics are positively correlated with achievement in mathematics, whereas Social value of Attitude Towards Mathematics is not correlated with achievement in mathematics positively and significantly. It further indicates that Attitude towards mathematics is positively and significantly correlated with the achievement in mathematics.

Table – III reveals that the obtained t-value between achievement of Higher and Lower groups on Utilitarian, Intellectual and Aesthetic values are 5.31, 7.01 and 7.47 respectively. The obtained t-value between achievement of Higher and Lower groups on composite attitude is 4.55. All these four t-values

TABLE III
Mean, SD and t-value between Achievement in Mathematics of Higher and Lower groups on different dimensions of Attitude towards Mathematics

Attitude Dimensions	*Groups*	*Mean*	*SD*	*N*	*t-value*	*Level of significance*
Utilitarian value	Higher	71.45	16.03	100	5.31	0.01
	Lower	58.75	17.71	100		
Social value	Higher	64.85	18.56	100	0.35	NS
	Lower	63.95	18.08	100		
Intellectual value	Higher	75.25	15.16	100	7.01	0.01
	Lower	58.70	18.13	100		
Aesthetic value	Higher	80.65	15.13	100	7.47	0.01
	Lower	62.80	18.53	100		
Composite Attitude	Higher	73.15	16.73	100	4.55	0.01
	Lower	60.55	22.12	100		

are significant at 0.01 (df = 198) level of significance. The obtained t-value between achievement of Higher and Lower groups on Social value dimension of attitude towards mathematics is 0.35, which is not significant.

The higher group is superior in their achievement in mathematics against Utilitarian, Intellectual & Aesthetic value dimensions of attitude towards mathematics and also against composite attitude (UM1 = 71.45, IM1 = 75.25, AM1 = 80.65 and CM1 = 73.15) in comparison to the Lower group (UM2 = 58.75, IM2 = 58.70, AM2 = 62.80 and CM2 = 60.55).

It indicates that the higher group on attitude dimensions and also on composite attitude (Except on Social value dimension) is significantly superior in their achievement in mathematics in comparison to Lower group on attitude dimensions and also on composite attitude (Except on Social value dimensions).

Findings of the study

(i) 51.80 per cent, 72.80 per cent, 50.20 per cent and 52.20 per cent of the students have favourable attitude towards Utilitarian, Intellectual, Aesthetic and Composite dimensions of attitude towards mathematics respectively. It indicates that more than half of the students taken in the sample bear favourable attitude towards the different dimensions of attitude towards mathematics and also on composite attitude. On Social value dimension of attitude towards mathematics it is slightly short to the 50 per cent mark (i.e. 47.40 per cent).

Lalit Kumar 1996 has found in his study conducted on primary school teachers that, "A few primary school teachers possess high favourable attitude towards mathematics."

Lalit Kumar and Sudhir Kumar 2010 has found that very few higher education students have favourable attitude towards privatisation of Higher Education.

Through various studies it has been reflected that to make favourable attitude is essential for achievement, success and proper training and the education system should take care of it. Jain, Rachna Jain 2007 has rightly concluded, "The present study further reveals the significant relationship between the attitudes and the teaching effectiveness of the teachers. It gives a strong message to those involved in training of teachers that it is not only important to empower the prospective teachers with knowledge and skills required for teaching but training should enable them to develop favourable attitude towards teaching profession and its allied aspects."

(ii) Utilitarian value, Intellectual value and Aesthetic value of attitude towards mathematics are positively and significantly correlated with achievement in mathematics, whereas Social value of attitude towards mathematics is not correlated with achievement in mathematics positively and significantly.

Attitude towards mathematics is positively and significantly correlated with the achievement in mathematics.

Lalit Kumar 1998 has the similar

findings in his study conducted on 300 Higher Secondary students of Budaun (UP) district, "Attitude towards mathematics is positively and significantly correlated with achievement in mathematics." Lalit Kumar 1994 has found that attitude towards mathematics plays a significant role in the development of mathematical creativity. He found significant relationship between attitude towards mathematics and mathematical creativity.

S. Saha 2007 found the component attitude in favourable direction of learning mathematics is a significant contributor to the success in the mathematical achievement of both boys and girls.

(iii) Higher group on attitude dimensions and also on composite attitude (Except on Social value dimension) is significantly superior in their achievement in mathematics in comparison to Lower group on attitude dimensions and also on composite attitude (Except on Social value dimension)

[Kumar, Lalit Kumar 1998 found in his study that, "High attitude towards mathematics group is significantly superior in his achievement in mathematics in comparison to the low attitude towards mathematics group". Kumar, Lalit Kumar 1994 found in one of his study the group higher on attitude towards mathematics superior in mathematical creativity than the group lower on attitude towards mathematics.

General Conclusions

Findings of the study and hypotheses of the study yield following general conclusions :-

(1) More than 50 per cent Higher Secondary School students possess favourable Attitude Towards Mathematics except on Social value dimension (47.40 per cent).

(2) Attitude Towards Mathematics (except Social value dimension of attitude towards mathematics) is significantly correlated with Achievement in Mathematics.

(3) Higher group on attitude dimensions and also on composite attitude (except on Social value dimension) is significantly superior in their achievement in mathematics in comparison to Lower group on attitude dimensions and also on composite attitude (except on Social value dimension).

Educational Implications

National Curriculum Framework for School Education 2005 while specifying the general objectives have clearly mentioned that the inculcation of positive attitudes is one of the vital objectives of education, "Education liberates human beings from the shackles of ignorance, privation and misery. It must also lead to a non-violent and non-exploitative social system. School curriculum, therefore, has to aim at enabling learners to acquire knowledge, develop understanding and inculcate skills, positive attitudes, values and habits conducive to the all-round development of their personality." The above statement clearly defines the role of positive attitude for personality development of students. Attitude has its bearing on Achievement. National Curriculum Framework. 2005 has also highlighted the role of positive attitude in mathematics education and has adviced to make the learner's attitude

favourable by making mathematics teaching activity based, "Having children develop a positive attitude towards, and a liking for, mathematics at the primary stage is an important, if not more than the cognitive skills and concepts that they acquire. Mathematical games, puzzles and stories help in developing positive attitude and in making connections between mathematics and everyday thinking." What NCF, 2005 has concluded with respect to primary stage is also true to the other levels of education. NCF (2000, 2005), present study and other related studies laid emphasis on development of favourable attitude as it has its bearing on achievement, development of creative ability and inculcation of scientific temperament.

The present study reveals that students with favourable attitude towards mathematics may perform better in achievement test in mathematics as compared to the students with unfavourable attitude. Students are the torch bearers of one's country. Hence, in order to be developed in science and technology, it is the foremost duty of the nation to develop positive attitude towards mathematics among the learners for their better achievement in mathematics, science and technology.

As founded in the study, achievement in mathematics is positively and significantly correlated with the attitude towards mathematics. Also, there exists a significant difference in the achievement in mathematics of Higher and Lower groups of students. This study has implications for teachers, parents, administrators and curriculum planner. The study must be utilised while framing the curriculum and making educational policies. The attitude towards mathematics must be taken into account and must be improved in order to have a sound creative mathematical ability of the nation. The teaching of mathematics should enhance the child's resource to think and reason, to visualise and handle abstractions to formulate and solve problems. For effective instruction and learning, there is need to create learning setting in the classroom that will enable the learners to actively participate in the process of instruction, rather than be passive listeners.

In brief, the findings of the study suggest that the attitude of learners be taken care of. It further suggests to make favourable attitude of learners towards mathematics to enhance their achievement in mathematics. The study also reflects the need of such studies with respect to other school subjects.

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Effect of Classroom Climate and Parental Awareness on Academic Achievement of Secondary School Students

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Abstract

The success of school life is judged by academic achievement of the student. Achievement depends on a number of factors like learner's ability, personality, intelligence, socio-economic conditions as well as environment of school, classroom and home. The feelings and emotions being shaped in a particular climate of a particular classroom is the basic source of motivation to learn something. The physical structure of classroom as well as interaction between student and teacher constitute classroom climate which shape the educational attainment of the child and if students feel themselves tense and hostile they may be led to poor learning. Similarly the students whose parents show keen interest in their studies achieve better in exams than the students whose parents show less interest in their studies. Besides the classroom climate and parental awareness it was also observed that location of the school has an important influence on achievement and students of urban area have an edge over the students of rural area in their academic achievement.

The main objectives of the schools are to have the students maintain the positive feelings towards learning, acquire the necessary facts, concepts and principles to solve important problems, arouse and satisfy distinct drives and feel reasonably good about them. To achieve all these broad goals, school's task is to provide classroom environment supportive to these goals. This is necessary because "A child's performance at school is not dependent on any attribute he happens to be born with. Instead, it is a complex response to his family and home environment, community and its values, his peers and other social contacts, his school or schools and their assessment procedures and overall climate of his school or schools (Gerd and Ugwuegbu, 1980)." Schooling can be conceptualised in a general sense as a process of interaction among the teacher and the students. Various studies have shown the effect of schooling on cognitive development of learners. However, the degree of facilitation due

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to schooling is always subject to the variation depending upon quality of schooling.

Learning takes place within a web of social relationships as teachers and pupil interact both formally and informally. Schools are institutional spaces for communities of learners, including both students and teachers. Play and scuffle with one's friend on the school grounds, free time to sit on the benches and chat with friends during breaks, gathering together for morning assembly and other festive and significant occasions in the school, anxious turning of pages before a class test, and trips made with one's classmates and teachers to places outside the school – all these are activities bringing the community together, giving it the character of a learning community. Behind the scenes, but still significant in giving the school its character, are the teachers and headmaster, planning and carrying out daily routines, examinations and special events that mark the school calendar. The community and schools both are required to organise these activities in such a fashion that their interactions support and enhance both teaching and learning. The physical and psychological dimensions of the environment are important and are interrelated. The space of the school should be nurtured in such a way that children feel safe, happy and wanted, and with teachers find meaningful and professionally satisfying.

The multidimensional development of the students is caused by variety of factors related to school, home and society. School environment that includes classroom climate and parent's outlook towards their children creates significant difference in the achievement of the students at secondary school level. Classroom climate could be described as a system comprising four sets of variables: the physical environment, organisational issues and characteristics of the teachers and of the learners (Moos, 1979). Classroom climate is a mediator among these variables that is formed or shaped through the interactions between the pupils and between the teacher and the pupils. An important factor, together with the quantity of such interactions and communications, is their quality, which in turn influences the learner's satisfaction, self-image and his/her learning process. Fraser,1988) defined classroom climate as determined by interpersonal relationships, the personal development of each individual and the systemic characteristics.

Classroom climate refers to the various psychological and social dimensions in the classroom such as degree of formality, flexibility, structure, anxiety, teacher control, activity and stimulation. Different classroom climate leads to different products. A positive classroom climate is essential to promote good students achievement, and it is important to foster positive student attitudes. A favourable classroom climate provides the framework within which students and teachers function co-operatively and productively.

Parental awareness is explored in a number of recent studies; a particular aspect of it is the concept of parents as a complementary educators or partners, with teachers in the learning process.

Parents as partners with a shared sense of purpose with teachers, provide the basis for improving students learning. Parental involvement, in almost any form produces measurable gains in students' achievement (Dixon, 1992:16). The concept of parental involvement with the student and the school is a vital one and can produce great rewards for all concerned. It has been found that schools do not always know what the term parental involvement really means. According to Vandergrift and Greene (1992: 57), two key elements work together to make up the concept of parental involvement. One of these is level of commitment to parental support. This includes such things as encouraging the students, being sympathetic, reassuring and understanding. The other element needed is level of parental activity and participation, such as doing something that is observable. "This combination of level of commitment and active participation is what makes involved parents". Parents' involvement actually declines as students grow older so that it is less in secondary schools than in elementary (Stouffer, 1992).

Achievement of the students is influenced by three factors: parents (family factors), teachers (academic factors) and students (personal caused factors). Degree of parental awareness is directly related to facilities and encouragement that students get from their parents which in turn creates motivation in class-room learning. Personality of the teacher, his values and teaching methodology and students personal factor, interacting all create classroom climate.

Objectives of the Study

The present investigation is led by the following objectives:

1. To compare the educational attainments of students belonging to schools with enriched and poor climate classrooms.
2. Comparison of educational attainments of students of schools located in urban and rural areas;
3. Comparison of educational attainments of wards of high aware and low aware parents.
4. To find out the effect of interaction of location of school, classroom climate and parental awareness on educational attainments of secondary school students in their board examination.

Hypothesis Tested

The following null hypotheses were formulated and tested to arrive at conclusions during the present study:

- Achievement of students of enriched climate classrooms and poor climate classrooms does not differ significantly.
- Academic achievement of wards of high aware parents is significantly higher than that of wards of low aware parents.
- Academic achievement of students of urban institutions and rural institutions does not differ significantly.

Delimitations and Scope of the Study

The study is confined to the students of class X studying in various institutions of rural and urban areas of Eastern U.P.

The reason for delimiting the study to only secondary stage is that this stage of education is considered more vital and is linked to the whole system of education. The applicability of findings of the research is greater for this stage.

The study is also limited to the students of eastern Uttar Pradesh only. Eastern part of U.P. differs in many respects. Socio-economic status and other facilities which are available to those people dwelling in western part of U.P are better in comparison to the eastern U.P.

The academic achievement which is a part of school learning has been used as dependent variable in the present study. Total marks as well as marks in science obtained by the students were taken as their achievement scores.

Design of the Study

This study was primarily aimed at finding out the effect of classroom climate and parental awareness on the academic achievement of high school students. For determining the effect of independent variables on dependent variables, relevant measuring devices were required. The researcher developed a scale to measure the classroom climate and parental awareness, because hardly any suitable scale was available to measure these variables. Two important intervening variables i.e. intelligence and socio-economic status of students were also measured and controlled by keeping their mean and standard deviation(S.D) equal. Total marks as well as marks in science obtained by students in high school examination of U.P. Board, were treated as achievement scores for this study. The scores obtained were subjected to 2 (rural and urban) 2 (enriched and poor classroom climate) 2 (high and low aware parents) analysis for the statistical treatment and interpretation.

Population and Sample

The sample included 435 students of class-X from 12 institutions belonging to rural and urban areas of Gorakhpur and Balrampur districts who appeared in high school board examination in 2008 selected randomly for the purpose of this study.

Variables for the Present Study

(i) Independent Variables

The independent variables for the study were:

(a) Classroom Climate;
(b) Parental Awareness; and
(c) Location of the schools.

(ii) Dependent Variables

The dependent variables for the study are total achievement and achievement in Science of secondary school students.

(iii) Controlled Variables

The socio-economic status and intelligence were controlled during the study by keeping the mean and SD equal for each group.

Measuring Devices

The following measuring devices have been developed and used in the present investigation. These are:

a) Classroom Climate Scale
b) Parental Awareness Scale

Administration of Tools

Each and every student included in the sample was approached during the month

of July/August 2008. The investigator took the prior permission of the heads of the institutions for data collection. First of all the test of General Mental Ability was administered and then SES scale was administered. It was decided to complete the tests in two sessions of a day so that students may not develop fatigue and boredom and there are no dropouts on subsequent test.

Two tests — Classroom Climate Scale and Parental Awareness Scale were used to categorise the sample. These scales were administered in the second half of the day. Thus the data collection for a school was completed in one day.

As a measure of the achievement of students selected in the sample, total marks as well as marks obtained in science by them in High School Examination were used.

Results and Discussion

The raw scores collected from different tests and scales were tabulated and analysed with the help of statistical procedure. There are a number of statistical procedures that are used for different purposes depending on needs and the nature of data. The present study has necessitated the use of following statistical procedures:

(i) Mean and Median
(ii) Standard Deviation and Standard Error.
(iii) Skewness and Kurtosis
(iv) Analysis of Variance

The data collected were treated using the statistical techniques mentioned above. A 2×2×2 analysis of variance was done to test the effect of various variables on the achievement.

Analysis Of Variance for the Academic Achievement Scores Obtained by Students

The obtained academic achievement scores by students were subjected to 2 ´ 2 ´ 2 analysis of variance. The three factors, school location, classroom climate and parental awareness were classified at two levels. Table 1 shows the results obtained. Table 4.1 shows that all the main variables, i.e. school location, classroom climate and parental awareness have significant effect on academic achievement. To be significant at 0.01 level, the F-value should be 6.91 for 95 degrees of freedom. The value of F regarding school location is 15.59 and significant beyond the 0.01 level. It shows that location of schools exerts different effects on total academic achievement of high school students. In the same way, classroom climate is also significant (df = 95-1, F = 19.95, P > 0.01). It reveals that students having enriched classroom climate have secured higher marks in comparison to students having poor classroom climate. Similar is the case with the effect of parental awareness. The F-ratio for this variable is also significant (df = 95-1, F = 14.56, P > 0.01). This value shows that wards of high aware parents secure higher marks than the wards of low aware parents. Table 1 indicates that all the interactive effects between variables fail to reach the level of significance even at 0.05 level of confidence.

Analysis of variance for the academic achievement scores in science

Achievement scores in science obtained by students were subjected to 2 × 2 × 2 analysis of variance. Table 2 shows

that all the main effects, i.e. school location, classroom climate and parental awareness are significant. Interaction between treatments is not significant. Obtained values have been given in the Table 2.

The Table 2 shows that the first treatment i.e. the location of schools is significant (df = 95-1, F = 50.20, P > 0.01) at 0.01 level, indicating a significant difference in the total academic achievement between the urban and rural location of institution. It shows that urban students score higher marks in science than that of rural students. The second treatment i.e. the classroom climate is also significant (df = 95-1, F = 58.18, P > 0.01) which indicates that students from enriched climate schools are better in their academic achievement than the students belonging to schools having poor climate. The F-ratio for parental awareness is 22.54 which is significant at 0.01 level. This indicates that wards of high aware parents secure significantly higher marks than wards of low aware parents. None of the two factors or three factors of interaction effects is significant even at 0.05 levels.

The basic problem taken up in this study was to investigate the relationship between classroom climate, parental awareness and achievement of the students in terms of total marks as well as marks in Science obtained by them in high school examination. It was assumed that whatever a child achieves or memorises in his school life is the outcome of complex variables operating upon him in situations he lives and grows up. Each of such situations is unique in the sense that operating variables in each of the situations are not the same. This uniqueness of the situations is also seen in classroom climate and parental awareness. Thus, the classroom climate and parental awareness are considered important variables in the academic achievement of the students. Following such expected relationship between these variables like classroom climate, parental awareness, location of schools and academic achievement, three hypotheses were developed in the study for verification. In the following lines data for testing each of the specific hypotheses have been presented and discussed.

(a) Classroom Climate and Academic Achievement

To find out the effect of classroom climate on academic achievement, a three-way analysis of variance (ANOVA) technique was adopted. A summary of ANOVA results is presented in Table 3.

Table 3 shows that number of students in the ANOVA for the enriched classroom climate schools was 52, and for the poor classroom climate schools was 44. The means of the academic achievement for the two groups were 386.62 and 350.68 respectively. The F-ratio for the difference between the two means was 18.10 for 95 degrees of freedom. It is significant beyond 0.01 levels. The significant F-ratio shows that there is less than one chance out of 100 that the observed difference between the two sample means could occur by chance. It can, therefore, be inferred that the academic achievement of students from enriched classroom climate schools is better than that of

TABLE 1
Summary Analysis of Variance for the Total Academic Achievement Scores of Students

Sources of Variation	*Sum of Square*	*Degrees of freedom*	*Mean Square*	*F-ratio*
A. Location of Schools (Urban-Rural)	20605.04	1	20605.04	15.59*
B. Classroom Climate (Enriched- Poor)	26422.70	1	26422.70	19.95*
C. Parental Awareness (High-Low)	19818.11	1	19818.11	14.56*
A × B	694.25	1	694.25	0.524
A × C	38.39	1	38.39	0.029
B × C	646.77	1	646.77	0.639
A × B × C	1617.47	1	1617.47	1.221
Error Variance	116529.20	88	116529.20	-
Total :	190520.00	95	-	-

** P>.01*

TABLE 2
Summary Analysis of Variance for the Academic Achievement Scores in Science

Sources of Variation	*Sum of Square*	*Degrees of freedom*	*Mean Square*	*F-ratio*
A. Location of Schools (Urban-Rural)	1537.44	1	1537.44	50.20
B. Classroom Climate (Enriched-Poor)	1781.67	1	1781.67	58.18
C. Parental Awareness (High-Low)	690.29	1	690.29	22.54
A × B	19.42	1	19.42	0.634
A × C	24.40	1	24.40	0.797
B × C	14.47	1	14.47	0.473
A × B × C	151.71	1	151.71	4.55
Error variance	2694.50	88	-	-
Total :	7156.96	95	-	-

TABLE 3
Means and F-ratios of Enriched Climate Schools and Poor Climate Schools on Different Achievement Tests

S. No.	*Achievements*	*Enriched Classroom Climate Schools*		*Poor Classroom Climate Schools*		*df*	*F-ratio*
		N	*Mean*	*N*	*Mean*		
1	Total Academic achievement	52	386.62	44	350.68	95	18.10
2	Achievement in Science	52	67.02	44	57.66	95	38.72

the poor classroom climate schools. The results of comparison of scores in Science of students belonging to enriched climate schools and poor climate schools is presented in Table 4.3 on serial no. 2. It is evident from the table that N was 52 and 44 for groups respectively. The means of the achievement in Science of two groups were 67.02 and 57.66 respectively. The F-ratio for the difference of achievement in Science of students was 38.72 for 95 degrees of freedom. It is significant at 0.01 levels. The significant F-ratio shows that there is one chance out of 100 that observed difference of the two sample means could occur by chance. Therefore, it can be inferred that achievement of students in Science of students from enriched climate classrooms is better than that of the poor climate classrooms. Thus, the null hypothesis H1 is rejected.

To sum up, it may be inferred from the table that academic achievement and achievement in Science of students of enriched climate classrooms is better than that of counterparts in poor climate classrooms. It seems that enriched climate classrooms generate good emotional warmth, cognitive encouragements, show fairness in decisions made by teachers and give more freedom for creative activities.

(b) Parental Awareness and Academic Achievements

To find out the effect of parental awareness on academic achievement, a three-way analysis of variance (ANOVA) technique was adopted. The results of ANOVA have been presented in Table 4.

It is evident from Table 4 that number of students in ANOVA for both, high aware parents group and low aware parents group was 48. The mean of the total academic achievement for the two groups were 384.12 and 355.77 respectively. The F-ratio for the difference between two means was 10.92 and the degree of freedom for the difference between the two means was 95 which are significant at 0.01 levels of confidence. The significant F-ratio shows that there is less than one chance out of hundred that the observed difference between the two sample means could occur by chance alone. It can, therefore, be inferred that academic achievement of wards of high aware parents is higher than that of the wards of low aware parents. The comparison of achievement in Science of these groups is available at serial No. 2 of Table 4. It is evident from the table that N was 48 for each group. The mean of achievement in Science for the two groups were 65.29 and 60.17 respectively. F-ratio for the difference between two means of above groups was 9.08 and df for the F-ratio was 95. It is significant beyond the 0.01 level. The significant F-ratio shows that there is less than one chance out of 100 that the observed difference could occur by chance alone. It can, therefore, be inferred that the achievement in Science of wards of high aware parents is higher than that of wards of low aware parents. Thus null hypothesis H2 is rejected.

(c) Location of School and Academic Achievement

A three way analysis of variance was adopted to find out the effect of location of schools on academic achievement. The results have been presented in Table 5.

TABLE 4
Means and F-ratios of high aware parents and low aware parents on Different Achievement Tests

S. No.	*Achievements*	*High aware parents*		*Low aware parents*		*df*	*F-ratio*
		N	*Mean*	*N*	*Mean*		
1.	Academic achievement	48	384.12	48	355.77	95	10.92
2.	Achievement in Science	48	65.29	48	60.17	95	9.08

TABLE 5
Means and F-ratios of Urban and Rural Institutions on Different Achievement Tests

S. No.	*Achievements*	*Urban Institution*		*Rural Institution*		*df*	*F-ratio*
		N	*Mean*	*N*	*Mean*		
1.	Total Academic achievement	48	386.08	48	354.21	95	13.80
2.	Achievement in Science	48	67.08	48	58.38	95	32.06

It is evident from Table 5 that N for each group was 48. The means of academic achievement of students from urban institutions and rural institutions were 386.08 and 354.21 respectively. The F-ratio for the above means was 13.80 for 95 df. It is significant at 0.01 levels. This indicates that observed difference between the two means is not by chance. Also, it can be observed that the mean of students of urban institutions is higher than that of rural institutions. Thus the null hypothesis of no difference in the achievement of urban and rural school students is rejected. The students from urban schools have achieved more and hence it can be safely concluded that location has a significant effect on academic achievement.

Table 5, could be seen that N was 48 for each group. The mean of achievement in science of students from urban institutions was 67.08 while that of rural institutions was 58.38. The F-ratio for difference of above means was 32.06 for 95 df. It is significant at 0.01 levels. The significant F-ratio shows that there is less than one chance out of 100 that of observed difference is by chance alone. Therefore, it can be said that the mean of achievement of students from urban institutions is higher than that of rural institutions. Therefore, the null hypothesis is rejected. It shows that there is clear cut difference between the achievements of two types of location of institutions. Urban students are superior in their academic achievement as well as achievement in science as compared to rural students.

The Findings

The major findings of the present study are as follows:

1. Academic achievement of students of enriched climate classrooms is better than that of students of poor climate classrooms.

2. Achievement of students in Science enriched climate classrooms is better than that of students of poor climate classrooms.
3. Academic achievement of wards of high aware parents is more than that of wards of low aware parents.
4. Achievement of wards of high aware parents in Science is more than that of wards of low aware parents.
5. Academic achievement of students of urban institutions is significantly higher that of students from rural institutions.
6. Achievement in Science of students from urban institutions is significantly higher than that of students from rural institutions.

Implications

As the classroom climate has been found to be an important contributor of academic achievement, the study has importance for the pre-service and in-service teachers. They should acquaint themselves with the factors contributing better classroom climate. They should be taught the effect of warmth behaviour and cognitive stimulation on the performance of the students. Also the study has importance for curriculum developers and counsellors. The parents should be actively involved in the policy making process for the educational system as the parental awareness has a strong effect on the academic achievement of the students.

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Effect of Constructivist Approach in Fostering Creativity of Primary School Children

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Abstract

The purpose of this study was to determine the effect of constructivist approach on students' creative ability. The study was a pre-test, post-test quasi experimental design and it was conducted in winter 2009 where 125 class-V students participated from two different English medium schools of Bhubaneswar city, Odisha. Learning in constructivist framework has been applied to experimental group and traditional teaching method followed by control group. The Creative Ability Test (CAT) used by the researcher to estimate the students' creativity from both the groups. The hypothesis was tested at 0.05 level using t-tests. The result showed that learning in constructivist strategy improve students' overall creative ability as well as other two different dimensions (Fluency, Flexibility) and no such difference found in case of Originality aspect of CAT. The researcher concluded that the constructivist approach is an effective strategy, which teachers need to incorporate in their teaching.

Introduction

Creativity is often viewed as the notions of genius or exceptional ability, but it can be enhanced, nurtured through students' active involvement on different learning activities in the classroom (Gulati, 1995). From the beginning, and especially now, our social and cultural system has been characterised by changes, renovations and restructuring. For the future development of our knowledge society we need creative and innovative people who can give answer to all the future challenges. Knowledge from neuroscience and investigation about creativity, reflect that the traditional learning models are a block to learning directed at future problems (DeHaan, 2009). So we have to strive for creative thinking and learning, which can stimulate the development of a quickly changing system not only in design but also with new perspectives. The constructivist approach offers a

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theoretical basis for developing a learning model in which students are led to active and reflective and which could codetermine their creativity (Tchimmel, 2004).

Constructivism is a theory of learning in which students construct their own knowledge on the basis of their prior experiences with meaningful interaction of learning activities (Tolman & Hardy, 1995). Learning in the constructivist framework contributes to intellectual, social and psychological development of learners unlike other methods of instruction and enable the learners to construct a valid knowledge and also enable to transmit it in different context (Kim, 2006). The results of Scott et al. (2004) suggest that constructivist learning theory that use strategies of scientific teaching to enhance content mastery can be effective in promoting creativity and cognitive flexibility. McGregor (2001), McFadsean (2002) cited that learning in brainstorming and students active construction of knowledge increase students score on tests of creative thinking abilities. Scottetal (2004) confirmed that creativity instruction can be highly successful in enhancing divergent thinking, problem solving and imaginative performance.

The creative process is impacted by distinctive interrelated items, the classroom learning methods and the classroom learning environment , D'Aloisio(2006); Dembo and Eaton (2000); Kostelecky and Hoskinson (2005); Riverio, Cabanach, and Aria, (2001). Again Sungur and Tekkaya (2006); Baer (1996) formulated three ways where creativity can be supported and nurtured in the classroom environment. The first way is to encourage imaginative questioning. Second, assign creative tasks and finally, reward the student who demonstrates creativity and imagination. In the area of creativity in school education, only a few studies have investigated the relationship between the teaching strategies and the fostering creativity skills; and the results found in such studies are encouraging. Breger (1958) reported teaching through demonstration increase in dimension originality of creativity. Meadow (1959) showed that training in brain storming increased the dimension of fluency in scores on creative problem solving.

All above studies focused on students' learning in a collaborative effort, explores the four factors impacting creativity in classroom environment (person, process, environment and product) and focuses on how the students' creativity may have increased, developed, or changed due to different strategies of learning process. Most of the studies in favour of learning in constructivist framework which enhanced students divergent thinking and hence there is an urgent need to integrate such approach in classroom teaching. The present study was designed to investigate the effect of Constructivist Approach (CA) over Traditional Method of Teaching (TMT) in enhancing creative abilities amongst class-V primary school children. The study was based on the assumption that learning in constructivist framework is considered as a better strategy than traditional method of teaching for developing competency wise creative abilities (fluency, flexibility, originality)

Objective of the study

- To study the effect of Constructivist approach on creative ability of primary school children

Hypothesis of the study

- Students taught through Constructivist approach will gain significantly higher score on Creative Ability Test (CAT) than their counterparts in control group

Sample and Sampling Technique

The sample consists of 125 class-V students from two different English medium schools in Bhubaneswar city. The selections of these two schools were through purposive sampling method. One section of each school was taken as experimental group and other one as control group. The decision about control group and experimental group was taken randomly from each school. Out of 125 class-V students, 74 students were randomly assigned to the experimental group and the other 51 students to control group.

Materials/Tools Used

In order to collect the relevant data for the present study, the investigator prepared and used the (i) Instructional materials and (ii) Measuring instruments.

- *Instructional materials:*
  The researcher developed different instructional materials which help in imparting instruction and facilitation for learning. Two types of instructional tools were used in this present study. The experimental group was exposed to constructivist approach (CA) and the control group was exposed to Traditional method of teaching (TMT).

The instructional strategies of Traditional teaching was limited to the control group where a teacher centred environment prevailed, and course instruction emphasised content recitation, without allowing time for students to reflect upon the material presented, relate it to previous knowledge, or apply it to real life situations (Fig – I).

"Experimental teaching" was based on the constructivist learning model as describe by Yager (1991), the 5E" (Engage, Explore, Explain, Elaborate, Evaluate) model developed by Bybee (1993) and applied by Lord (1998, 1999, 2001). The learning situation consisted of a series of activities in which the researcher introduced new material (Engage), followed by the formulation of a problem or exercise (Explore). Then the learners were asked to explain and elaborate followed by evaluation. Depending on the nature of the task involved or the degree of difficulty, students were given to solve these problems with the members of their co-operative group. This provided an opportunity for interaction with other classmates as they tried to make sense of the new information relevant to past experiences or previous knowledge. Then researcher listens carefully the students expanded concepts what they have learned and how they make connection to the world around them. At the end Evaluation, the fifth 'E' is an ongoing diagnostic process that allows the researcher to determine whether the learners have attained understanding of discussed concept.

TEACHING STRATEGY

Control Group	***Experimental Group***
Teacher-Centred	Student-Centred
Passive learning through teacher's lectures	Active learning through constructivist activities
No co-operation groups	Formal co-operative groups
No interaction among students	Constant interaction among students
Sporadic assessment learning	Daily assessment of learning

Figure 1: Table showing the differences in teaching methods between the control and experimental group.

- *Measuring instrument and validation:*

Creative Ability Test (CAT) was used to measure fluency, flexibility and originality. Test-Re Test formula was used to calculate the reliability coefficient of CAT and the co-efficient of internal consistency for CAT was 0.71 which was highly reliable.

Experimental Design and Procedure

The experiment was set up according to the non-equivalent pre-test post-test quasi experimental design. The design as follows:

Randomly Assigned Group	**Pre-Test**
Experimental Group	A1
Control Group	A3
Treatment	**Post-Test**
Learning constructivist framework	A2
Traditional Method of Teaching	A4

A1, A3 – Pretest of Creative Ability Test (CAT)
A2, A4 – Post test of Creative Ability Test (CAT)

Before starting the experiment the researcher conducted CAT pre-test to ensure whether the two groups had achieved the same levels of creativity performance.

During the treatment process, the experimental group participated in the constructivist approach and the control group participated in the normal traditional instructional strategy. The researcher himself taught to both the experimental group and control group in each school separately. In experimental class in order to create the constructivist learning situation, the researcher followed the 5E' instructional model (engage- explore- explain-elaborate-evaluation) and continuous students growth was measured through tests, observations, portfolios. The treatment was given for a period of 12 weeks to both the experimental and control group. At the end of the experiment, the same Creative Ability Test (CAT) post-test was administered to the two classes to compare their creative ability and to ensure the effect of intervention.

Results and Discussion

Analysis was carried out using both descriptive and inferential statistics. In order to determine the effect of Constructivist Approach, the data were analysed taking in to consideration the overall creativity scores of students as well as different dimension (fluency, flexibility and originality) of CAT.

TABLE 1
Pre-test T-value and Descriptive Statistics of Creativity Scores for Two Groups

Test	*Groups*	*Mean*	*SD*	*df*	*t-value*
Creative Ability Test (CAT)	Experimental group (N=74)	81.78	32.54	123	1.50
	Control group (N=51)	76.01	24.78		

TABLE 2
Post-test T-value and Descriptive Statistics of Creativity Scores for Two Groups

Test	*Groups*	*Mean*	*SD*	*Df*	*t-value*
Creative Ability Test (CAT)	Experimental group (N=74)	88.85	25.84	123	4.11
	Control group (N=51)	83.12	21.11		

TABLE 3
Pre-test Mean, SD and T-value of Different Dimensions of CAT for the Two Groups

Test	*Dimension*	*Group*	*Mean*	*SD*	*Df*	*t-value*
Creative Ability Test (CAT)	Fluency	Exp. (N= 74)	24.16	10.22	123	0.23
		Cont. (N= 51)	23.93	8.34		
	Flexibility	Exp.(N= 74)	15.59	6.10	123	0.87
		Cont. (N= 51)	16.46	5.42		
	Originality	Exp.(N= 74)	33.45	13.53	123	1.19
		Cont. (N= 51)	35.60	12.93		

Table-1 indicates that the mean creativity scores of experimental and control group are (M1= 81.78 and M2= 76.01 respectively. The t- value of 1.50 with df 123 reveals that the difference between the two mean creativity scores is not statistically significant at 0.05 level. Hence both the groups are found almost equal in their creativity abilities.

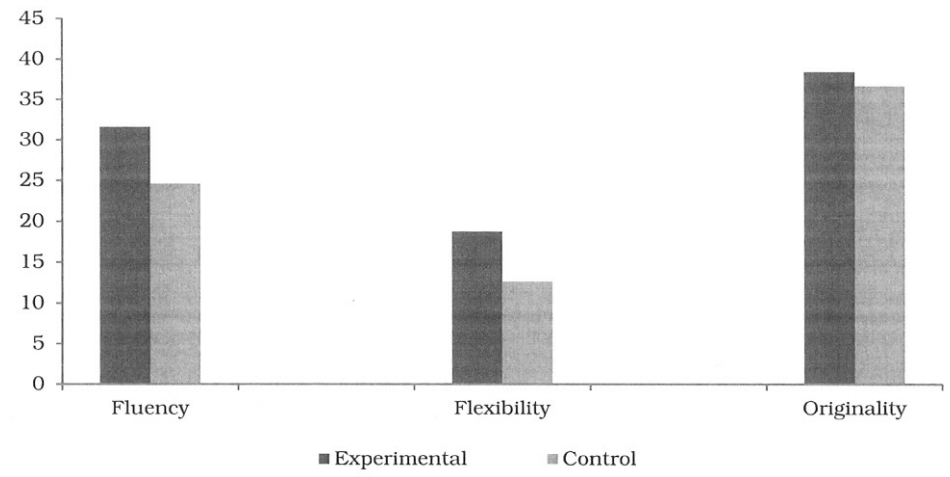
The Table-2 reports that the mean creativity score of the experimental group (88.85) is greater than that of the control group (83.12). The t-value of 4.11 with df 123 is significant at 0.01 level which is in favour of experimental group. In other words the Constructivist Approach has a significant effect on the development of overall creativity of the learners.

Further, to study the effect of Constructivist Approach on different aspects such as- fluency, flexibility and originality of creativity of the learners, the creativity scores of both the groups in fluency, flexibility and originality were analysed separately.

Table-3 result shows that, the t-value of 0.23, 0.87, and 1.19 with df 123 on creativity test of fluency, flexibility and originality is not significant at 0.05 level. Hence there is no significant difference in the pre-test mean score of fluency, flexibility and originality among experimental group and control group.

TABLE 4
Post-test Mean, SD and T-value of Different Dimensions of CAT for Two Groups

Test	*Dimension*	*Group*	*Mean*	*SD*	*Df*	*t-value*
Creative Ability Test (CAT)	Fluency	Exp. (N= 74)	31.60	10.39	123	6.99
		Cont. (N= 51)	24.61	7.97		
	Flexibility	Exp.(N= 74)	18.81	6.01	123	4.12
		Cont. (N= 51)	12.69	4.68		
	Originality	Exp.(N= 74)	38.43	11.73	123	0.75
		Cont. (N= 51)	36.68	12.87		



Mean score of the students of experimental group and control group on fluency, flexibility and originality of class-V students

Table 4 reveals that the t-value of 6.99 with df 123 is significant at 0.05 level. It shows that there is significant difference between the mean score of experimental group and control group and the constructivist approach has a significant effect in enhancing fluency of the class-V students. The t-value of 4.12 with df 123 is significant at 0.05 level. It reveals the fact that the constructivist approach has a significant effect in enhancing flexibility of class V students. The t-value of 0.75 with df 123 is not significant at 0.05 level. It reveals the fact that the constructivist approach has no significant effect in enhancing the originality of class-V students.

TABLE 5

Analysis of Co-variance (ANCOVA) for Fluency Dimension of Creativity Test of the Two Classes

Dependent variable post-test on fluency scores

Source of variation	*Sum of squares*	*df*	*Mean squares*	*f-value*
Corrected model	13.902.62	1	13902.62	374.11
Co-variate (pre test scores)	13902.62	1	13902.62	374.11
Main effect	1914.48	1	1914.48	51.51
Error	8435.71	123	37.16	
Total	203896.00	125		
Corrected total	22338.34	124		

TABLE 6

Analysis of Co-variance (ANCOVA) for Flexibility Dimension of Creativity Test of the Two Classes

Dependent variable post-test on flexibility scores

Source of variation	*Sum of squares*	*df*	*Mean squares*	*f-value*
Corrected model	44.08.03	1	4408.03	377.28
Co-variate (pre test scores)	4408.03	1	4408.03	377.28
Main effect	822.15	1	822.15	70.36
Error	2652.15	123	11.68	
Total	79396.00	125		
Corrected total	7060.19	124		

TABLE 7

Analysis of Co-variance (ANCOVA) for Originality Dimension of Creativity Test of the Two Classes

Dependent variable post-test on originality scores

Source of variation	*Sum of squares*	*df*	*Mean squares*	*f-value*
Corrected model	16.095.18	1	16095.18	318.74
Co-variate (pre test scores)	16095.18	1	16095.18	318.74
Main effect	5326.21	1	5326.21	1.28
Error	11462.57	123	50.49	
Total	333995.00	125		
Corrected total	7060.19	124		

Table 5, 6 and 7 result shows that the experimental group which was exposed to Constructivist Approach, had a significantly higher creative ability in both fluency and flexibility dimension of CAT but no such different found on originality dimension as indicated by the F-value: 51.51, 70.36 and 1.28.

From the above analysis, it is concluded that Constructivist Approach (CA) is an effective strategy than Traditional Method of Teaching (TMT) for developing fluency, flexibility competency, but not the originality competency. Though originality is an important component of creative ability, the present study of Constructivist Approach did not show any significant effect than TMT for achieving this. This failure of Constructivist Approach for achieving the target level of originality competency may be due to two reasons, (i) originality ability is an in-depth and unique ability of individual which requires a long term training for its development, but the existing strategy of teaching was only meant for 12 weeks which could not develop the originality ability of the learner; and (ii) the learning situations/ activities in Constructivist Approach may have some sorts of limitations to develop the originality competency.

Conclusion

The main objective of this study was to investigate whether the meta-learning strategy of Constructivist Approach could be used to enhance creative ability among the class-V students. Two different school of Bhubaneswar city were chosen to participants in the experiment. The results showed that students in the constructivist class significantly improved in their creative ability as a whole and also in fluency and flexibility dimension of CAT as compared to the students in the traditional expository teaching class. This finding is in agreement with earlier findings such as Gulati (1995), Tchimmel, (2004), Scott et al. (2004), McGregor (2001), McFadsean (2002).

This study provides substantiated evidence that teaching in a constructivist, active learning environment is more effective than traditional instruction in promoting creativity and enhancing students interest in mathematics. In their final course evaluations, students in the experimental section commented that they enjoyed this class much more than their traditional classes, they had learned more, made valuable friendships in their collaborative groups. Although the constructivist method of instruction requires a greater investment of time and effort for preparation, organisation, grading and majority of this investment is made the initial part of teaching but after subsequent effort, students themselves to start how learning ought to be. Such meta-learning strategy of Constructivist Approach and the experimental design in this study can be easily extrapolated to different school subject like language, social science & sciences. The teacher should try to create learning situation in the classroom, guide learners' learning process and provide opportunities to learners to reflect their learned concepts, so that creativity can be enhanced through classroom learning process. 'Creative spirit' and generous, joy are key in childhood both of which can be distorted by an unthinking adult world (NCF 2005).

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Error Analysis of English Language: A Study of Mara Students of Class X

D ELIYAS*

Abstract

The paper attempts to observe and analyse the errors of the Mara learners of English in the context of second language learning situation at Class-X level in the schools of Maraland, Saiha District, Mizoram. The sample consisted of 350 students (183 boys and 167 girls) randomly selected from 607 Mara students from 24 randomly selected High schools of Saiha District, Mizoram. To identify the areas where the Mara students face problems in discourse, a free composition on 'The Christmas' was administered. The identified errors were noted on the margin of the answer scripts and then tabulated under broad categories as tense, preposition, article etc. Findings related to errors committed by students studying in different types of schools, schools in rural and urban area etc. were compared and sources of the errors were found out. Remedial strategies were also suggested on the basis of the findings.

English which came to India as a historical necessity and then developed into a lasting affinity has since gone through several stages in the hands of policy makers. With the growth of national movement, there was a demand that English should no longer continue as the medium of instruction in schools and colleges. The regional languages were made the medium of instruction which resulted in an alarming deterioration in the standards of the teaching and learning of English. So various commissions were appointed to look into the matter and to suggest ways and means to rectify the various inherent problems of English teaching-learning process and its position in the curriculum.

When we turn the pages of history of formal education in Mizoram, one of the seven States of North East India, we find that before the arrival of Christian Missionaries, there was no formal system of education in Mizoram and all information was passed on to the next generation orally by parents and elders. Family played a very important role as an informal agency of education for the children as they received their education, culture, tradition, norm, value etc. informally mostly from their parents at home.

The first missionary who came to Mizoram was William Williams who arrived at Aizawl, the capital of Mizoram, on March 20th 1891 and remained at

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Aizawl for 29 days from 20th March to 17th April. J H Lorrain, one of the first missionaries of the Arthington Aborigines Mission, and F W Savidge arrived at Aizawl on January 11th 1894 (Thursday). (Chhangte, 1987)

J H Lorrain and F W Savidge, having noticed the illiteracy of the Mizo people, earnestly devoted their time to learn Mizo language in order that they could prepare Mizo alphabet. As a result of their hard work in learning the language, they could reduce the language to writing, using the Roman script with a phonetic form of spelling based on the well known system of transliteration. The 'Duhlian' dialect known to all the sub-tribes of Mizoram was standardised by the missionaries in 1894. Then they started a primary school on April 2, 1894 with two pupils. Simultaneously they also started "Bible School", a system of 'Sunday School' for learning the Gospel. The Government school was established on 21st August 1897 with Kalijoy Kavyatirtha as its schoolmaster. (Sangkima, 2004). Thus, the two missionaries gave to the Mizos the supreme gift of a written language and a literature and prevented Bengali from becoming the trade and court language for the Mizos. So, they may be considered to be the "Father of Mizo Education". (Hluna 1992).

Saiha District is one of the Districts of Mizoram situated in the southern part of Mizoram, it covers an area of 1445 Square Kilometres. It is flanked on the north and west by the Lawngtlai District of Mizoram, and on the east and south by the Chin State of Myanmar. Geographically, the district is isolated from the rest of India both by its distance and forbidding nature of hill terrains. Majority of the people of this area is called Mara. The whole region inhabited by the Maras is commonly called 'Mararâh' in the local language meaning the 'land of the Maras' or Maraland.

It is the Christian missionaries who introduced the formal education in this hilly region and education is the most important contribution of the missionaries, besides religion. Today's high rate of literacy in the district is a direct result of the foundation laid down by the early Christian missionaries. So the educational history of Maraland can be traced back to 1907 when the first missionary, R A Lorrain, arrived at Saikao, a small village in Saiha District, on 26th September 1907. After having stayed in Maraland for six months, R A Lorrain realised the importance and extreme need of script, and so he drew up an alphabet of his own which was solely applied to the Tlosai dialect and introduced in 1908. The most important and significant contribution made by Lorrain was the introduction of Alphabet in the Roman Script resulting thereby in the inculcation of the culture of reading and writing. This was the genesis of the present education system in Maraland. Thence started formal school education in his own residence, Mission premises, at Saikao.

Need for the study

The purpose of the present study is to observe and analyse the errors of the Mara learners of English in the context of second language learning situation at Class-X level in the schools in Maraland. A Class-X student studies English for nine years in vernacular medium schools

and eleven years in English medium schools. So one would expect that a Class- X student will be able to read English and understand it, understand spoken English on general topics and write English correctly for the purpose of study, narrate an incident or a festival in which they are involved. But it was found that majority of the students are unable to use English in this manner. It is observed that some students knew the rules of grammar but found it difficult to use those rules to express themselves or write an application for leave or for a job or fill in various application forms.

No study was conducted, so far, in Maraland, on the Mara students, who had a different linguistic background, at High School level or at any level to find the reasons for their low proficiency in English. The present study is a humble attempt to fill in the gap. The following objectives were formulated to achieve the goal.

Objectives of the Study

1. To identify, classify and analyse errors in written English committed by Mara students,
2. To find out the sources of the identified errors,
3. To compare the students studying in different types of school managements in relation to the errors committed in free-composition,
4. To compare the students of urban and rural schools in relation to errors in free-composition,
5. To suggest measures (remedial strategies) for improving the present position of teaching of English to eradicate these errors in written English at Class-X level.

Theory Applied

The Error Analysis theory has been used here to analyse, identify and classify the linguistic difficulties of the learners. "The errors committed by the learners can be observed, analysed and classified to reveal something of the system operating within the learner is called Error Analysis" (Brown,1994). Whenever a language is learnt or acquired one is faced with the problem of errors. Error is an inevitable feature of learning. They, in fact, are part of learning and reveal the strategies that learners use to learn a language. To Pit Corder "They (errors) are integral to the language learning and manifest the learner's 'transitional competence' by providing evidence of the system of the language that a learner is using at a particular point of time"(Corder 1975).

In the context of second language teaching-learning process, error has been described as "An utterance, form or structure that a particular language teacher/native speaker deems unacceptable because of its inappropriate use or its absence in real life discourse" (Hendrickson 1978). In other words, errors are systematic, consistent deviances characteristic of the learner's linguistic system at a given stage of learning. They result in unacceptable utterances and appear as breaches of the code. They are not physical failures but the sign of an imperfect knowledge of the code. When the learner begins to learn a second language he finds difficulties at all levels of linguistic structure – Phonology, Morphology and Syntax. To overcome these linguistic difficulties, he makes successive hypotheses about the

structure of the language to which he is exposed and then tests the hypotheses in his actual performance. "The rules that he formulates are proved correct if the form he produces is an acceptable one in the language in question, but need to be revised if the form is unacceptable. The latter appears as an error in his speech" (Wilkins, 1982). Committing error is the sign of imperfect knowledge of the formation rules of the target language.

The learner is seen as being in the state of 'transition' from his native language which he has mastered to the target language still being learnt. The L2 learner can be represented somewhere along the line between native and target language. It is with this intermediate stage that Error Analysis are concerned. Error Analysis does not restrict the analysis only to the errors caused by the gravitational pull of the mother tongue but deals with all kinds of linguistic deviations in the learners' performance in the target language. It shows that the grammar of learner's language is only partially similar to grammar of L1 and L2 and is accessible through the study of learner's expressive performance including the analysis of his errors.

Methodology Used

The study was carried out on a sample of 350 students (183 boys and 167 girls) reading in Class X in randomly selected 24 High Schools functioning under different managements of Saiha District, Mizoram. Descriptive method was used to collect data.

In order to get specific information regarding their linguistic problems, a 'free-composition' for about 250 words on "The Christmas" was given to the students. (Only Mara Tribe students were selected. There are other tribes also). The intention was to introduce a descriptive topic within the experience of all learners so that it would generate some amount of personal involvement in it and they would come out with an essay long enough to provoke them to use the language freely so as to reveal the areas of difficulty faced by them in English. As Pathak says, "The writing of an essay undertaken with a high degree of personal engagement is most likely to bring the learner's errors to the fore"(Pathak, 1988). The 'walk-in-test-on' method was followed intentionally so that the students had no opportunity to come prepared with ready-made answers. The answer sheets were collected after 40 minutes and evaluated. The procedure adopted for the analysis was to mark out the errors on the response sheet itself. Then in the margin, for convenience, the error type was noted like 'Article', 'Preposition', 'Tense' etc. These were then tabulated under broad categories like 'Article, 'Preposition', 'Tense' etc. and frequency and percentage of the error types were found out. The errors committed by the learners had been classified into errors in verb form and pattern, errors in syntax, errors in tense, errors in article, errors in preposition, errors in punctuation and miscellaneous errors etc.

To test the reliability of the result of free-composition, a reliability test on the same topic was administered after a gap of one month to randomly selected 100 students from among the 350 students. Collected papers were evaluated, errors identified and classified as done in the first test. It was found that the score

difference between these two tests was negligible confirming the reliability of the result of free -composition.

Findings

A. *Findings Related to Errors in Free Composition*

Table showing errors in percentage of free-composition, average number of errors committed by students of govt. schools, aided schools, deficit school and private schools, errors committed by students per head in urban and rural schools and the average number of errors, error types and errors per head in the free composition are calculated and given below.

Table 1 reveals that students committed more errors in syntax, lexis and spelling, tense, indicating that the learners had more difficulties in these areas than others. They committed the least number of errors in miscellaneous. The whole picture gives the signal to English teachers to pay more attention to these difficult areas.

TABLE 1
Errors in Percentage of Free Composition

Error types	*Errors in percentage*
Verb Form and Pattern	10.91%
Syntax	19.01%
Tense	11.25%
Preposition	9.88%
Article	10.86%
Lexis	13.96%
Spelling	11.45%
Punctuation	8.91%
Miscellaneous	3.77%
Total	100.00

TABLE 2
Average Number of Errors Committed by Students of Govt. Schools, Deficit School, Aided Schools, and Private Schools

Types of school	*Sample of students*	*No. of errors committed*	*Per head errors committed*
Govt.	82	6808	83.02
Deficit	25	1521	60.84
Aided	78	5029	64.47
Private	165	10564	64.02

Table 2 indicates that deficit school students committed the least number of errors per head whereas students of govt. schools committed the highest number of errors per head. Govt. schools show very poor performance and aided schools follow it. Private schools are better than aided schools in terms of errors in free-composition.

Table 3 shows that students of rural schools committed more errors than students of urban schools. In rural area, students of aided schools committed more errors than the students of govt. schools. But in urban area, the students of govt. schools committed the highest number of errors than that of all other schools. Aided schools in urban area performed better than all other schools having less number of errors.

B. *Sources of errors*

After careful analysis of the 'free-composition' on 'The Christmas', it was found that the Mara learners of English committed more errors in syntax, lexis, verb form and pattern, tense, and spelling. It revealed that the learners had difficulty in the above mentioned areas where they committed more

TABLE 3
Average Number of Errors Committed by Students in Urban and Rural Schools

Status of schools	*Urban*			*Rural*		
	No. of students	*No. of errors*	*Errors per head*	*No. of students*	*No. of errors*	*Errors per head*
Govt.	35	2758	78.8	47	4050	86.17
Deficit	25	1521	60.84	*	*	*
Aided	60	2767	46.12	18	2262	125.67
Private	165	10564	64.02	*	*	*

** Shows absence of deficit and private schools in rural area.*

errors. It was felt that the sources of these errors could be attributed to over generalisation, inadequate exposure, failure to internalise the rules of the target language, and influence of the learners' mother tongue (Mara) and their first language (Mizo).

When the learners committed errors like 'goed, for 'went', 'wented' for 'went', 'comed' for 'came', 'cutted' for 'cut', 'eated' for 'ate', 'hitted' for 'hit' etc. are obviously because of overgeneralisation. In this case, learners felt that just an addition of 'ed' would change the verb form in present tense into its past form on the analogy of 'play+ed', 'push+ed', 'call+ed' etc. In most of the cases, it was observed that many of the errors occurred because of inadequate exposure to the proper rules of language usage. For example, errors of omission of articles in a sentence and use of capital letters in place of small letters and vice versa etc. can be placed in this category. Learners, perhaps, were not made aware of the importance of these items as conveying some meaning as far as the article was concerned.

The inability of the learners to match subject and verb in a sentence, the confusion and ignorance of the learners about verb-present, past and future with their different tense aspects – could be attributed partly to mother tongue interference and partly to inadequate teaching and lack of exposure or practice in appropriate contexts. The influence of mother tongue had caused a large number of errors. The absence of articles in Mara language had affected the learners' use of proper articles in English. In fact, the learners were influenced by their mother tongue to such an extent that they literally translated their thoughts into English with no regard to whether their sentences were correct and appropriate to the context or not. The difference between their mother tongue (Mara) and English in matters of Phonology, Morphology, Syntax, etc. also created teaching-learning problem. For the Mara learners of English, the problem is two-fold. When they go for literal translation, from their mother-tongue they come to Mizo and only then go to English which is actually L3 for them. All these caused much confusion and problems in the minds of the learners resulting in errors.

Besides these, learners' haste and

carelessness were other sources of errors. Of the various error types, lexical and spelling errors were of different nature. It has been mentioned earlier that the learners have inadequate opportunities for exposure to good models of English. As a result, they often pick up unacceptable pronunciation of words. Moreover, due to exposure to not so good models of English they are often unable to distinguish between many minimal pairs like /k/ and /g/, /? /and /?/ and /?/ and /d/ and like. These confusions manifest themselves in the form of errors in spelling. The problems of Mara students lie on those sounds which are present in English but absent in Mara. For many Mara learners, the consonant phonemes of English like /g/, /?/, /?/, /?/, /? /, /w/, /j/, / ?/, which are absent in Mara, pose problems in perception and production. Mara learners are often found to equate /g/ with /k/, / ?/ with /d/, /?/ with /s/, / ?/ with /z/ or /s/, /?/ (dental fricative) with 'th', /j/ with /i/ etc. For example /g?u/ becomes [ko], /?/ becomes 'da', /?ip/ becomes [sip],/?et/ as [set] etc. Thus incorrect pronunciation leads to wrong spelling.

It was, therefore, felt that grammar exercises should be practised in the context of an utterance or discourse as a short-term remedial measure. In the case of pronunciation, acceptable and intelligible pronunciation may be practiced in the classroom. Students may be asked to listen to English news bulletin on TV and Radio to improve their vocabulary and pronunciation. If this is done the learners would get adequate exposure to the communicative form of the language and might acquire the proficiency in English language.

C. Remedial Strategies to Rectify Errors

To rectify the wrong use of 'be' form before verb, verb stem+ed after 'to infinitive' form, problem with irregular verbs, reduction of auxiliaries, verb form after have, has, had etc. verb form after auxiliaries, etc. may be explained with many examples with rules. The uses of modal auxiliaries are to be explained with examples. To rectify the problem in errors of concord, singular plural, wrong use of negatives, direct – indirect, wrong use of voice, inversion of verbal question etc. are to be explained with examples. To rectify the errors in lexis, vocabulary ought to be taught in the context by using the techniques such as – showing actual objects or models, actions, pictures, blackboard sketches, verbal contexts, synonyms, antonyms, associated vocabulary, the game of antakshari, description of known objects, places and events etc. are also to be discussed. To rectify the problems in tense, past tense, present tense and future time reference should be explained with suitable examples. In addition, dynamic verbs, stative verbs are to be explained with examples. To rectify the wrong use of articles, general rules and exceptions to rules are explained with many examples. Similarly, cases where definite article and indefinite articles should not be used etc. are to be explained with examples. To deal with prepositions such as 'into, out of, under, above, towards, away, through, on,' etc. are to be explained with simple sketches.

To rectify the wrong use of spelling also, techniques such as use of mnemonics, focusing the trouble spot, and other important rules to correct spelling are to be discussed. To solve the problems in punctuation especially wrong use of capital for small, small for capital, using capital or small in the middle of a word, writing personal pronoun 'I' as 'i' in small letters, sufficient written drills and explanation with examples are to be discussed.

A combination of Situational Approach and Communicative Approach are thought to be better for teaching English to develop and improve the Mara learners' communicative competence in English.

Apart from academic functions, other functions outside the classroom where knowledge of English will be useful for the students are the activities involving filling in application forms, writing different letters, replies, asking for and giving directions, facing an interview, making reservations, booking tickets, supplying correctly all information regarding themselves necessary to fill in various application forms, carry out transactions in a shop or bank, to respond to a phone call etc. The students must be able to transfer grammatical competence to communicative competence. So the teacher may use the syllabus in such a way that it would make students use the rule of a language in a real situation and consequently to enable them to deal with any kind of communicative situation in future.

Conclusion

Modern-days India needs citisens who can use English in many different ways effectively. The importance of communication in the modern world cannot be underestimated. The ability to read and interpret the language correctly and express effectively and articulating both in person and on paper is becoming more important. To achieve this end and to make language a matter of habit, it is hoped, the given remedial exercises would help to rectify the linguistic difficulties of the Mara students studying in Class-X in Maraland. 'Bridge Intensive Course' is hoped to bridge the gap existing in proficiency of English between middle school and high school. The recommendations focused to develop communicative English would help the teachers to have more tolerance to errors and to pay individual attention in class, work in close harmony with students and create such an atmosphere that encourages students to feel 'tension-free' to use English and learn better so as to have considerable proficiency in English. In addition to this, English teachers, if possible, may try to understand the linguistic problems of the learners by giving them regular class tests and analyse the answer scripts to build up a picture of the features of language which cause learning problems for the learners and their linguistic competence at that time and take suitable remedial measures to rectify the problems. Teaching-learning English cannot be considered only as a means of passing an examination but as a means to have communicative ability in English to face the present and future competitive world. For want of competent teachers, if we let English be taught badly at the high school level, then during the latter years, the problem of remedial

teaching becomes virtually intractable and beyond correction. So, timely and relevant remedial actions may be taken to help learners of English to improve their general performance and communicative competence in English.

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Correlates of Academic Procastination and Academic Achievement of Undergraduate Students

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Abstract

Procrastination is now a common phenomenon among students particularly those at the higher level and this is doing more harm to their academic achievement than good.Therefore, the present study was conducted to examine the relationship between academic procrastination and academic achievement of undergraduate students. The study was conducted on a total sample of 90 undergraduate students of Sambalpur, University of Odisha. The adapted version of Tuckman Procrastination Scale (adapted by the investigators) was used for the collection of data. Findings indicated that; a significant correlation was found between academic procrastination and academic achievement of undergraduate students, significant difference also exists in the academic achievement of students having low, moderate and high academic procrastination. Students with low procrastination performed better than the students having moderate and high procrastination. Results further revealed that the subjects procrastinate in the same way irrespective of their gender. Implications of procrastination on academic achievement of students were suggested.

Students are said to be the future of a nation upon which the destiny depends to a large extent. Being the most important factor of a nation's development this section of young and educated population constitutes the crux of human resource. Hence their development holds immense significance in effecting overall development of any nation. One of the commonest problems worrying to this particular segment of population is the tendency to put things off until the last moment- or to beyond the last moment. However university students are particularly vulnerable to this problem. This problem is called procrastination. Some persons just like to put off taking actions. They never do today what can be put off until tomorrow. Postponement of activities

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is an important hinder in the way of effective time management (Arora, 2002) This behaviour is common among students in the school and college levels (Wolters, 2003). Estimates indicate that 80 per cent to 90 per cent college students engage in procrastination (O' Brien, 2002). Academic procrastination is a form of procrastination peculiar to education (Behnke and Sawyer, 2005). It is regarded as a behaviour pattern that can have particularly serious consequences for students whose academic lives are characterised by frequent deadlines. Obviously, when it turns to our students' lives, procrastination can also cause delay in studying behaviours (Tice and Baumeister, 1997), in drafting works or reports, missing deadlines to hand in papers, and putting of administrative tasks related to academic life, such as returning library books, registering for an exam, and so forth (Scher and Ferrari, 2000). Skipping classes or delaying in handling in works is also consequences of academic procrastination (Scher and Osterman, 2000).

Despite the fact procrastination occurs in all kinds of daily tasks (Alexander and Onwuegbuzie, 2007), academic procrastination is highly frequent in students and is regarded as detrimental to academic progress and success. It is estimated that academic procrastination in tasks related to academic life is a common phenomenon for about 70 per cent of university students (Ferrari et al., 2005). The most frequent consequence of procrastination is poor individual performance (Dewitte and Schouwenburg, 2002).

While much has been studied about procrastination in adults and graduates across academic and non-academic contexts and across individuals in the United States, United Kingdom, and Australia (Ferrari et al., 2005; Ferrari and Scher, 2000; Lee, 2005), there is surprisingly little research exploring this subject in an Asian context (Ang, Klassen, Yeo, Wong, Husan and Chong, 2008). Taking this fact into consideration the investigator made an attempt to study the relationship between academic procrastination and academic achievement of under-graduate students in Indian context.

Objectives of the Study

1. To investigate the academic procrastination of undergraduate students.
2. To investigate the relationship between academic procrastination and academic achievement of undergraduate students.
3. To compare the academic procrastination of male and female under-graduate students.
4. To compare academic achievement of the undergraduate students based on their level of procrastination (low, moderate and high).

Hypotheses of the Study

1. There exists no significant relationship between academic procrastination and academic achievement of undergraduate students.
2. There exists no significant difference in academic procrastination of male and female undergraduate students.

3. There exists no significant difference in academic achievement of the undergraduate students based on their level of procrastination (low, moderate and high).

Method

Participants

A random sample of 90 under-graduate students from three different colleges affiliated to Sambalpur University of Odisha was selected for the present study. The sample consisted of 52 male students and 38 female students.

Measures

In this study Tuckman Procrastination Scale and Personal Information Sheet were used to gather data.

Tuckman Procrastination Scale: The adapted version (adapted by the investigators) of Tuckmen Procrastination Scale (2001) was used for collection of the data. The scale has a total of 56 statements. The statements are rated on a 5 point Likert scale with response options of Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree. The adapted scale has a reliability of 0.74.

Demographic Information Sheet: The demographic data of the participants were gathered through Demographic Information Sheet (DIS). DIS includes participants' name, gender, class, streams (Arts/Science/Commerce), date of birth and academic achievement. The participants' performance in last two examinations (1st year and 2nd year of Graduation) was taken from their academic record. This represents the participants' academic achievement scores.

Procedure

First of all permission was taken from the head of the institutions for the collection of data. The purpose of the study was explained to the participants and consent to participate in the study was obtained from all the participants involved. All the participants were administered the adapted version of Tuckman Procrastination Scale and the short demographic measure in an organised classroom setting. The completion lasted approximately 45-50 minutes.

Different statistical techniques were used for the analysis of data. Mean and Standard Deviation were employed to analyse the academic procrastination of under-graduate students. Coefficient of Pearson correlation was utilised to investigate the relationship between academic procrastination and academic achievement. t-test was used to differentiate the academic procrastination of male and female under-graduate students. Difference in the academic achievement of low, moderate, and high academic procrastinators was investigated using t-test.

Results

TABLE 1
Academic Procrastination of under-graduate students N = 90

Academic Procrastination Scores	*No. of students*	*Classification*
Above 173	22	High procrastinators
Between 129-173	46	Moderate procrastinators
Below 129	22	Low procrastinators

Table 1 depicts that out of the total 90 under-graduate students 22 students i.e. 24.5 per cent have high level of academic procrastination, 46 students i.e. 51 per cent have moderate level of academic procrastination and the remaining 22 students i.e. 24.5 per cent have low level of academic procrastination.

TABLE 2
Correlation between Academic Procrastination (AP) and Academic Achievement (AA)

Variables	*N*	*df*	*r*	*Level of significance*
A. P.	90	88	0.23	Significant at 0.05 level
A. A.	90			

The results of the correlation analysis (Table 2) reveals that there is a negative and significant correlation (0.23) between academic procrastination and academic achievement of under-graduate students. It means as academic procrastination increases, academic achievement decreases.

TABLE 3
Gender difference and Academic Procrastination (AP)

Variables	*N*	*M*	*SD*	*t*	*Level of significance*
Male	52	151.5	25.2	1.11	Not sig. at 0.05 level
Female	38	157.26	23.4		

Table 3 shows that no gender difference exists in the academic procrastination of male and female under-graduate students. This is shown with t observation (1.11) is less than t-critical at 0.05 level and 88 degree of freedom. Though Female students were found to have more AP (M=157.26) than Male students, the difference is statistically not significant. This implies that both male and female participants exhibit the same level of academic procrastination.

TABLE 4
Academic achievement of subjects and their levels of Academic Procrastination (AP)

Levels of AP	*N*	*M*	*SD*	*t*
Low AP Moderate AP	22 46	66.32 59.50	9.75 10.65	2.62**
Low AP High AP	22 22	66.32 58.59	9.75 5.32	3.27**
Moderate AP High AP	46 22	59.50 58.59	10.65 5.32	0.47**

*** Significant at 0.01 level of significance,*
***NS** Not Significant*

From the Table 4 above, low procrastinators had a mean academic achievement of 66.32 and a standard deviation of 9.75, while moderate procrastinators had a mean academic achievement of 59.50 and a standard deviation of 10.65. The difference between mean values of two groups (2.62) is statistically significant at 0.01 levels. This indicates that a significant difference exists between the academic achievement of low and moderate procrastinators with low procrastinators performing better than the moderate procrastinators. Furthermore data on the mean academic achievement of low procrastinators (M=66.32, SD=9.75) were compared with those of high procrastinators (M=58.59, SD=5.32). This analysis showed a mean difference of 3.27 which is significant at 0.01 levels. This indicates that the academic achievement of low procrastinators were better than those of high procrastinators.

On the other hand another comparison of mean academic achievement of moderate procrastinators (M=59.50, SD=10.65) and high procrastinators (M=58.59, SD=5.32) showed a mean difference of 0.47 which is not significant at 0.05 level. This suggests that the academic achievement of moderate and high procrastinators is not different.

Discussion

The present research examined a) the academic procrastination of under-graduate students, b) the relationship of academic procrastination with academic achievement, c) the difference in academic procrastination of male and female students, d) the difference in academic achievement of low, moderate, and high procrastinators. As a result of the research it is stated that 25 per cent and 51 per cent of the undergraduate students have high and moderate levels of procrastination behaviour respectively. These results reveal that 76 per cent of under-graduate students have academic procrastination behaviour. This result of the present study is consistent with the result of Potts (1987).

Another finding of the present study indicates that academic procrastination is negatively related to academic achievement which is in congruence with the findings of the studies conducted by Balkis and Duru (2009) who found a negative and meaningful correlation between academic procrastination and academic achievement, Tice and Baumeister (1997) and Senecal and Vallerand (1995) also reported that students who have strong tendencies to procrastinate tend to have low examination grades than non-procrastinators, Popoola (2005), Akinsola and Tella (2007) reported that academic procrastination is associated with poor academic achievement.

The next finding of the present study is that academic procrastination does not differ in respect of gender. The gender differences concerning procrastination behaviour is considerably difficult to envisage (Steel, 2004). By going through the literature on this issue it can be stated that the findings of the studies on the procrastination behaviour–gender relation are inconsistent with each other, while some of the studies reveal that procrastination behaviour does not differ according to gender (Watson, 2001; Hess, Sherman, and Goodman, 2000; Konovalona, 2007; Klassen and Kuzucu, 2009), other studies state procrastination behaviour is seen more in female students (Dolye and Paludi, 1998; Washington, 2004); and other studies claim procrastination behaviour is found more in male students (Balkis and Duru, 2009; Steel, 2007; Hampton, 2005; Prohaska, Morrill, Atiles and Perez, 2000).

The result of the study also indicated that there is a significant difference in the academic achievement of high, low and moderate procrastinators. Students with low procrastination have higher academic achievement than students with moderate and high levels of procrastination.

Educational Implications

The present results, supported by the results of Balkis and Duru (2009), Akinsola and Tella (2007), Popoola (2005) suggested that procrastination should be considered as detrimental to

the academic performance of students. The findings of the present investigation have implications for time management among the undergraduate students. It also suggests some preliminary implications for educational practice.

For a student to be able to confront and control his or her procrastinating behaviour the first stage is to look at self-critically and determine the distractive and incompetence attributes that negates his positive behaviours towards his academic activities. Procrastination as a form of incompetence has to be eliminated in order to cure it (Akinsola and Tella, 2007). Since incompetence is the opposite or lack of competence, the only way to eliminate it is to be replaced with competence (Wikibooks, 2006). Personal competence comprised of five elements: emotional strength, well directed thought, time management skills, control over habits and task completion abilities (Wikibooks, 2006). Improvement on these personal competences is a surest way of overcoming procrastination. Students may be given frequent tests instead of home works. Tuckman (1997) found that when given frequent tests rather than homework assignments, the academic performance of procrastinators improved dramatically, so much so as to move them from the bottom to the top of their class. Also a procrastinator may need to start with the easiest task and proceed from there to a more rigorous and demanding tasks. Success in the easier task is likely to motivate and ginger him to more difficult task and hence building up confidence in his ability to tackle academic matters (Akinsola and Tella, 2007). One of the major reasons why people avoid the very tasks that free them from mediocrity is their lack of self confidence (Plessis, 2006). For adolescent procrastinators both boys and girls- lack of confidence in ability to perform is a key factor related to high level of task delay (Klassen and Kuzuku, 2009). So measures should be taken to enhance the self confidence of students. Both parents and teachers can play equal role in this case.

Instil in students the skills of self arrangement and time management may serve to decrease procrastination. Therefore, it is thought that organising group work which aims to equip students with the skills and habits of effective time management, planned study, and sensible expectations for academic work and problem solving will be beneficial in decreasing the level of procrastination tendency in students (Balkis and Duru, 2009). Proper time management can be done through the preparation of realistic schedules and keeping to them, prompt execution and submission of assignments, avoidance of working under pressure and persistent study for examinations. Furthermore, the students should use various methods of time management in order to reduce their high level of procrastination. Such methods include defining objectives before activities; detecting and avoiding time wasters; determining to focus on major priorities; developing the habit of do it now rather than postponing every task that needs urgent attention and avoiding being workaholic (Ajayi and Osiki, 2008). Parents could help to prevent procrastination by developing study skills in their children that would allow them to avoid distractions (e.g.,

studying in comfortable, quiet settings, keeping their desk neat, fulfilling a work plan at home, turning off the TV and the cellular phone etc). These aspects could help to increase students' commitment to the tasks and to teach them to postpone gratification, essential dimensions in the promotion of will power competences and prevention of academic procrastination (Rosario, Costa, Nunez, & Pienda 2005). At the same time, achievement expectations can be induced in procrastinators, for example, by performing work plans that include intermediate goals, an adequate work setting, and assigning enough time to task performance (Rosario et al. 2007). Bill Gates advocating fast tract strategy of life and work in his book "Business at the Speed of Thought" states that, "The 21st century will be an age of fierce competition, therefore one must be just in time for everything– a reform, an experiment, a product, a program, an innovation or a challenge. The education manager must do time management. He must also do crisis management as well as trouble management. He must do it, and should not get sidelined for delay, procrastination, drift indecision, waverliness, a dogmatic attitude, inflexibility and non compromisingness."

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Role of GIS in School Geography

APARNA PANDEY*

Abstract

GIS is a fast developing area with vast potentiality for geography education. Since it is based on inquiry based learning it ignites young minds in exploring the world around them. While GIS is rooted to geography, it's strong linkage to mathematics and statistics help in developing analytical skills. For last more than one decade, the NCERT has made efforts continuously to strengthen school geography curriculum by including GIS at higher secondary stage (NCFSE -2000 and NCF-2005) and by providing in-service training in GIS to geography teachers, regularly from 2008. There is a need to make concerted efforts at all levels to improve its visibility in educational institutions for better application. With adequate training, analysis and interpretation of spatial data it would be much easier and interesting for students and teachers as well.

Introduction

Geographical Information Systems or GIS is a set of computer tools used to capture, store, transform, analyse and display geographical data. There are five elements that are important in GIS: (1) computer hardware (2) GIS software (3) geographic data (4) people and (5) procedures.

In other words it consists of powerful hardware, software, data and a thinking operator along with a powerful technology for storing, analysing, displaying and processing spatially referenced data. Together they provide significant tools for mapping and analysing information about people, places and the environment. Inclusion of this technology in geography education helps and promotes the higher order thinking skills of observation, exploration, questioning, analysis and evaluation.

Geographical Information Systems (GIS) have been listed among the most important developments in the 20th Century (Cook and others 1994). GIS have revolutionised the methods and dimensions of spatial analysis resulting in a dramatic change in the direction of Geography. ... It has also led to significant reforms in geographic education. (Birtain, et al., 1996). GIS are being used extensively by researchers, scientists and civic planners to assist decision making about real world problems. Application of this technology to such concerns as the, agriculture, environment and land use management is occurring on local, regional and

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national levels. Recently even the government policies and schemes related to school education mandate school mapping exercise to be done by GIS for planning and implementation of school improvement programme.

The Potential of GIS in School Geography

Geography is the science of our Earth which describes it's physical and cultural patterns and processes. Geography makes us aware of what is around, helps us better understand various spatial phenomena and their interrelationships and gives us systematic information for planning and decision making. GIS empowers geography by providing digital tools that conceptualise and organise geospatial data, model geographic processes, visualise these data and models with advanced computer techniques.

In India GIS was introduced in school geography curriculum in 2000 (NCFSE 2000) which has got more impetus at higher secondary stage in NCF 2005. But unfortunately after more than one decade, Geographical Information Systems (GIS) have not yet been widely introduced at higher secondary level in geography in all States. As far as development of curriculum is concerned, the National Council of Educational Research and Training as a professional institute in the area of school education, strongly feels that curriculum development in India , is not a one time venture but an ongoing process. In fact, curriculum is a device to translate national goals into educational experiences. "If Geography is to make a continuing and distinctive contribution to the education of young people, then curriculum development in geography will need to be a continuing professional activity"(E. Rawling 1987 et al). Geography in the school curriculum has evolved remarkably well in Independent India.

One of the three criteria that devised to rationalise the inclusion of any subject in the school curriculum is whether it is capable of developing student's skills and capabilities (Naish, et al. 1987). In this way, through the inquiry process, geographical investigation using GIS requires that students develop a range of skills and an awareness of when to use them. We should not, however, focus on developing skills merely for geography's own study, but to contribute to 'an education for social competence... not in specialised knowledge' (Piper, K. 1994). With the use of GIS, geography foster skills in social competence by emphasising the importance of encoding information based on spatial characteristics, (Kam, T.S.1996) and by manipulating this information to generate new geographical information to devise recommendation for the resolution of issues (Laurence, et al.1993).

GIS has the potential to facilitate the implementation of constructivist, problem based learning and inquiry-based learning environment at schools. This robust tool allows teachers and students to explore and analyse information in a new way. Application of GIS enables students to do in-depth study of local issues. The proper implementation of GIS instruction can promote geographic skill and interdisciplinary learning in the classroom.

The advantages of GIS seem to be enormous to geography education if harnessed correctly. But unfortunately theory and practice are hard to bring together in real life. Despite its potentials, many schools in India still lack the resources and know-how required to use GIS in geography education.

The potential roles of GIS in school geography are many and diverse. One of the major areas in which GIS can contribute to students' educational experience is through the development of faculties of critical thinking. In particular it can help in developing the ability to analyse, synthesise and evaluate. In that way, students' logical, mathematical, linguistic, spatial and inter -personal intelligence can be enhanced. Logical- mathematical intelligence includes numeracy (the ability to interpret and use numbers and numerical skills) and technological capacity (the ability to understand and use tools which facilitate acquisition, processing and information). Linguistic intelligence includes literacy (the ability to interpret and present information in word form) and graphicacy (the ability to read and use visible symbols). Spatial intelligence important for thinking geographically, includes map literacy (the ability to transform real life into a mental or visual picture, or vice-versa, at multiple scales). Finally, interpersonal intelligence focuses on communication (the ability to transfer effectively to others, through multiple modes of representation), the information and knowledge obtained from variety of sources through investigative process.

A GIS provides methods through which user can explore alternative responses for specific problems and situations. Users will need to define what constitutes a satisfactory answer to their questions. Critical thinking plays a primary role in using GIS effectively. Explorations thus involve profound challenge for learners.

With GIS both students and teachers can be active learners at the same time. By developing new skills and exploring new understandings of a variety of topics, teachers can model for students the process and value of lifelong learning. Using GIS can also help students and teachers become more concerned as local community members and global citisens. Partnering with others GIS users in the community enacts the community as classroom concept. Students, schools and community all benefit as each pays closer attention to the requirements of the other.

Even in Indian universities GIS has not been included in the first year of undergraduate geography course. In most of the universities like Banaras Hindu University, University of Delhi, University of Pune, Vishwa Bharati University, Shantiniketan, Calcutta University, etc. GIS has been introduced only in the third year of undergraduate geography course. Even in some universities it is included at postgraduate level. Moreover GIS should not be taught as a practical subject but geography is a subject which can be understood better through GIS. Therefore it is crucial to teach geography with GIS instead of about GIS. The purpose and value of providing the links between secondary and higher education is to emphasise the need for continuity in the education system. In other words

a 'start and finish' to the teaching of GIS in geography education not just in schools but also in higher education. GIS undoubtedly provides strong focus for geography as a subject.

Hindrances in GIS Education at School Level

The lack of GIS implementation at higher secondary stage in different states may be due to a number of factors. The following major hindrances have been identified to the implementation of GIS in the schools by Meyer, and et al. (1999) which are also found true especially in the states for which teacher training programmes in GIS were organised by the NCERT:

- The unavailability of appropriate hardware and software.
- Time for teachers to 'master the use of the new technologies , and time within the existing curriculum to introduce a new learning experience.
- The need for training and on-going support and evidence to teachers after training, and timing that support 'relative to the availability of the hardware and software'.
- The lack of curricular connection for GIS application.
- The limitations of teachers' own "spatial literacy" and a pervading "simplistic view of geography" (place, names and regional facts) (Meyer et al. 1997, p.572, Bednarz and Ludwig, 1997, p. 126).

Many school systems hesitate to devote the resources necessary to acquire the advanced software, continually update hardware, and afford the teacher training necessary to provide their students with exposure to the use of GIS. Ample evidence exists to suggest that, in order to learn new technology, teaching strategies, teacher need information, theory, modelling, coaching, support and feedback through sustained, intensive experiential learning opportunities (Fullen, M G and M Mites 1992). Simultaneously teachers must continuously cope with limited resources and availability of time when planning and implementing their lessons.

Capacity Building of Teachers in GIS

During our interaction with different State authorities and teachers on various occasions it is found that most of the teachers teaching at higher secondary level are not exposed to GIS as a part of their college education. Keeping this in view, NCERT had organised quite a few introductory training programmes in GIS for a duration of one week especially for in-service Post Graduate Teachers in geography as master trainers. In the first phase, during 2008, teachers were invited from Kendriya Vidyalaya Sangthan, Navodaya Vidyalaya Samiti and other CBSE affiliated private schools. The programmes were organised in collaboration with the three premier institutes of India i.e. Indian Institute of Remote Sensing, Dehradun, (IIRS), National Remote Sensing Centre, Hyderabad (NRSC), National Atlas and Thematic Mapping Organisation, Kolkata (NATMO). During this period, three programmes were held for three different zones i.e. North, South and East covering all regions of the country. The programme in Kolkata was organised especially for N E Region and Eastern region. The purpose of these

programmes was to remove initial fear of teachers in using modern technology and make them capable in handling the course in GIS effectively in the classroom. The course was designed in such a manner which could easily be grasped by the teachers using hands-on activities. The second phase of the programme was taken especially for the States using NCERT textbooks at Higher Secondary Stage. In this connection during 2009 and 2010 Geography teachers from States like Sikkim, Bihar, Jharkhand, Goa and Kerala were trained by NCERT. More than hundred Post Graduate Teachers in Geography from across the country have been trained in GIS as Master trainers by the NCERT by the year 2010.

It has been observed that some private companies have started teaching software based GIS in schools, just by providing training to teachers and students on how to use a particular software. This trend has been producing GIS technicians without imparting the knowledge of GIS. An understanding of GIS can be developed by proper study, practice and above all, with a logical aptitude in this area. Without proper and precise GIS education, we will produce GIS skilled labourers, but with proper GIS education we may prepare GIS scientists and researchers.

Conclusions

In the world over, Geography has been recognised as a vital discipline at school level. Inclusion of GIS in Geography curriculum and exposure of students to this at school stage may help them use this technology appropriately later in life. The use of GIS to aid the instruction in basic geographic concepts may help in reducing spatial errors which are usually made by individuals in their daily lives. It is crucial that students learn to analyse large quantity of data using computer technology. There is no better discipline for the fulfillment of this goal than geography. By this means students and teachers can work collectively to build a coherent draft of information about their own region.

To take full advantage of GIS for enhancing geographic education at school level, we must create a group of geography teachers as master trainers who specialise in applications of geographic technology. It is believed that geographers have grasped the potential offered by the new technologies to complement and developed core geographical principals and passed these skills on the young people- thus simultaneously keeping the subject vibrant and relevant and ensuring that our students are well prepared for the world they will live in.

As technology brings us all ever closer to each other, it seems only too obvious that there is a need to understand more fully the changing relationships between people, places and the world. We share many parts of existence and need to explore our common ground. GIS may foster a resource rich environment, enhance spatial reasoning and support problem solving in the classroom. Parallel to the use of other Information and Communication Technology (ICT) in education, GIS also provides the students with experience and technical know-how, which may be beneficial for their future job opportunities.

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Paulo Freire: His Thoughts on Adult Education

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Abstract

The present article focuses on the development of Paulo Freire as an adult educator and an educational thinker. For his views and practices he was arrested and exiled in March 1964 by the military government of Brazil, and could only return in 1980. In the mean time he was working as an advisor to World Congress of Churches. During 1980-1988 he was made in charge of Adult Education projects of Workers' Party. In 1988 he was appointed Minister of Education.The key features of Freirean approach are 'dialogue' and 'problem solving'. For native language literacy, words are selected showing the most important concerns of the people. The literacy training is provided through three sub-stages: motivational sessions , development of teaching material and literacy training (de-codification). Of course the scholars and workers in the field of adult education, have shown several flaws in his approach.

Paulo Freire (1921-1997), the famous author of the Pedagogy of the Oppressed, was born on 19 September 1921 in Recife, the capital of Brazil's Northeast province, in a middle class family. His father was an officer of military police. The children were educated in traditional Catholic way by their mother. The peculiar quality of his father was the communication allowed by him and the closeness that was brought by dialogues with his children that opened new vistas of thought in children. It is said that the father taught his children alphabets by writing in the sand and combining them to form words, before they started their schooling. During the economic depression (1928-32), Freire family had to move to a less expensive place named Jaboatao in a nearby province. That gave a loss of two years of secondary education to young Paulo. After his graduation, he joined Law but his studies were interrupted many times since he had to earn a living and support his family.

Freire, in his youth, was influenced by a lawyer Rui Barbosa and a medical doctor Cameiro Ribeiro. After the completion of his law degree Freire became qualified for teaching in secondary schools. During 1944 and 1945 years he taught Portuguese language and also worked as a trade

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union lawyer and lectured on legal matters in the suburbs of Recife.

The contact with state-run trade unions helped him to be appointed in Social Service for Industry, SESI, as the head of department of Education and culture. In 1954 he became the director of the organisation, but resigned from the post when his open, democratic and free style of administration was criticised.

It was in SESI's kindergartens and schools where Freire had made an attempt to involve students and parents in discussions about educational matters. He was firm that most of the educational problems related with educational milieu, such as malnutrition and child labour could only be tacked with the support and involvement of parents.

In 'workers clubs' Freire encouraged the workers to come out with their problems, but insisted that they should not leave the solution of the problems to SESI only. They should themselves found ways to overcome the problems facing them. According to Gerhardt (1993, p.2), the aim of such work was to 'integrate the worker into historical process' and to 'stimulate him to the individual organisation of his life in the community'. Freire asserted that for the real democratisation of Brazil, the principles of dialogue, parliamentarisation and self-government could be practiced within the institutional boundaries. He also worked in many parishes of Recife. For example, he undertook a project with priests and lay persons in 'Casa Amarela', where seven units of the parish, from kindergarten to adult education, worked together in the areas of curriculum development and teacher education; the results were to be shared with other groups who would be encouraged to work together on organisation and content with the aim of parliamentarisation of the participants. Techniques like study groups, action groups, roundtable discussions, debates and the distribution of themed flash cards were used in the work.

Freire's experience with the educational project of SESI helped him to get appointment as a part-time teacher of Pedagogics at the University of Recife. But the political situation of Brazil in 1950s and in 1960 was intellectually ferment. There were influences from European intellectuals like Karl Mannheim, Karl Jaspers, Gunnar Myrdal and Gabriel Marcel on the Brazilian intellectuals related with Higher Institute for Brazilian Studies at Rio de Janeiro, therefore contemporary sociological and philosophical outlooks were read and discussed in educated circles frequently. It was the Catholic Students' Club, which was trying to submerge itself in the social problems, and during his years at the university Freire became deeply involved with their activities and literature. It provided a system to his thinking and acting. But he was an eclectic who took good ideas from persons as divergent as Jaspers and Marx.

Freire appreciated and applauded the involvement of students in political activities inside and outside the university and this was severely opposed by some of his colleagues, but his nearness and friendship with Joso

Alfredo Gonclaves da Costa Lima, first vice chancellor and then chancellor of the university saved his tenure. He became special councilor for student relations and later in 1962, the director of university's extension services. When in 1960, the administration of the city of Recife was taken by left-wing leader Arraes, who started Popular Culture Movement (MCP); Freire advocated and supported it most sealously. But the irony of the situation was that the Catholics, Protestants and communist militants inside MCP had different interpretations of their educational and organisational tasks. And a primer for literacy work with adults resulted in a conflict in Freire's education department concerning the process of instruction and cultural awareness.

The authors of the primer had used five 'generative' words: povo (people); voto (vote); vida (life); saude (health); and pao (bread). The authors used the syllables of the words and made sentences like 'The vote belongs to the people', 'People without houses live in slums', 'In the Northeast there will only be peace when the grievances are remedied at the roots' and 'Peace emerges on the basis of justice' were created. The authors had thought that they will inspire people for having political discussion and also be able to form its structure and content. But Freire were opposed to giving messages to illiterate people. Messages would always have devastating effects whether they came from the rightists or leftists. Then both sides would demand the uncritical acceptance of the doctrines, resulting in manipulation. For Freire, avoiding manipulation meant: The convictions and opinions, i.e. the curriculum, must directly came from the people and must be prepared by them; yet the convictions and opinions should correspond to the transition phase.

But Freire could not convince the authorities by his view point. Part of MCP (Popular Culture Movement) started working the directive approach. As a result Freire reduced his association with MCP; he began to experiment and develop his own ideas with his colleagues in the Extension Department of the University. He knew that people had talent to reason, and when he showed a picture of a boy along with the Portuguese word for a boy to his illiterate housemaid, repeating the syllables of the word and then uttering the full word, he found that the housemaid noted the missing syllables and thus 'learned' that the word was composed of syllables. He had already observed that many workers showed interest in political questions, related with their needs and problems, therefore, it was necessary to show the pictures that depicted the problems, to arouse the workers to learn the words, and then to read and write the words related with the actual problems. Freire had learnt that for illiterate people it was not sufficient to begin with the discussion of reality, because they had severe impressions of their failures in school and other learning environments. It was necessary to motivate the persons, and this could be done with the help of folk-materials like pottery, weaving, wood-carving, singing, theatre etc., that the person was acquainted with. This method proved its merit, because it was said that one person, only with twenty-

one hours of training could read newspaper articles and write the sentences. The experiment was brought to an end after thirty hours, at the rate of one hour per day for five days per week.

Writers and workers related with adult literacy and literacy education have named Friere's approach as Problem –approach, the psycho-approach, the learner-approach, the liberatory approach, the participatory-approach and the contextual approach. All of these names signify and emphasise different perceptions of the same approach. It can also be considered a variant of the whole-language approach to literacy.

According to David Spener (p.1), and it is an important part of the Freire's approach, the thematic content of literacy-education in Freire's programmes is drawn from the culture of the learners. And, the culture is not what the idealists' perception of it is. Culture comprises of how the people labour, create, and make life-choices. It is never a static-unchanging- set of customs, beliefs- religious and social, attitudes, forms of address and dress and foods. It is a dynamic process of transformation and change laden with conflicts to resolve and choices to be made both individually and as a community. Freire has also been viewed as an exponent of 'literacy for social change', because Freire argues that unjust social conditions are the cause of illiteracy, and the purpose of adult basic education is to enable the learners to participate in liberating themselves from the conditions that oppress them. We don't need proof of it. In large chunks of Asia, Africa, Latin America, the privileged classes, forcibly deprived the majority of the population from the literacy and education for centuries.

The two key features of Freirean approach are dialogue and problem-solving. For Freire, 'dialogue' is an "I-thou relationship between two subjects" in which both parties confront each other as knowledgeable equals in a situation of genuine two-way communication. It should be noted that for Freire, teacher and student are on equal footing. And if the teacher is knowledgeable about his subject- the language in literacy setting- the learner knows well about his and community's culture. The teacher is not solely responsible for transmitting knowledge to the learner. Here the student and the teacher both are viewed as if they in a circular mode of transmission, both facing each other and reflecting and developing insights, as well as discussing the issues concerning their own lives.

In the Freirean approach the cultural themes are presented in the form of open problems, which are incorporated into the material as stories, pictures, comic-strips, and video dramas, and these are used to open discussion. The teacher asks the learners to talk about the themes presented in the material and expand them. That way, the questioning leads the learners to define, the 'real problem; its cause and the possible solutions.' These solutions evolving from group discussions require the skill of reading and writing to give them a concrete shape. That gives the learners the purpose and motivation for literacy.

For native language literacy, the Freirean approach was based on the

discussions Freire made with a team of anthropologists, educators, and students in Brazil. It was to develop the literacy instruction in Portuguese for the rural peasants and rural people.

The first phase of the literacy plan consisted of social research in the communities where the programme was to be implemented. Members of the team lived in the communities, had discussions with students, observed their culture, and during informal conversations listened to their actual life stories. They took extensive notes of the meetings and conversations and found out the most recurring themes and words that affected the life of these people deeply.

In the second phase, the members of the team selected 'words' from the lists that were to be used in the actual literacy programme for decoding and encoding printed material. According to Freire, in 1970, only 15 words of Portuguese language were needed to generate all other words of the language. Freire was of the belief that the chosen or 'generative' words must have special affective importance to learners and should have the power and force to evoke the social, cultural, and political context in which learners make use of them.

In the third phase, termed the actual process of literacy training, comprises of three sub-stages: motivational sessions, the development of teaching material, and literacy training (decodification). According to Ojokheta (p.2-3), in the motivational sessions, the coordinator shows the pictures to students, without using words. The purpose of this step is to provoke among learners, some sort of debates and discussions about the situation in which these people live. This promotes among illiterate students learning and reflection, helping to promote group consciousness.

The sub-stage of development of teaching materials, involves materials to be developed according to different situations. These materials are of two kinds: The first type consisting of a set of cards or slides showing the breakdown of words into their parts. The second type consists of a set of cards which depict situations related to the words and designed to impress various images upon the students. These pictures are designed to stimulate the students to think about the situations which are connoted by words. This process of developing images of concrete realities has been called by Freire, the codification. Several pictures shown to students depicting the situations and conditions in which they live, codify the situations. The codification process serve as aids in teaching process, and also help in initiating and stimulating the process of critical thinking in students.

In the stage of actual literacy training (decodification), each session is built around words and pictures. Here, the generative words are presented with a picture of the word. The literacy class starts with breaking down both- the word and the picture. The students discuss the existential situation of the word and the relationship between the word and the reality it signifies. Then a slide is shown, showing how the word is separated into its syllables. And the first syllable is combined with other vowels, forming a family. The process is repeated with other syllables. The students are then led to make other

words using these syllables and their families, simultaneously discussing and analysing the real context represented in the codification. This shows that the process of literacy training is intimately connected with the political and cultural life of the students.

According to John A. Sparks (p.3), there are three tenets of Freire's educational thinking or in other words Progressivism. These are: (1) Opposition to transmission of knowledge, (2) The classroom should provide environment of freedom in which the students' expressed interests and impulses give direction to classroom activities, and (3) The traditional teachers' role of guidance, control and direction should be reduced so as be almost non-existent.

Freire is of the opinion that knowledge cannot be transmitted from one person (the teacher) to another (the student). He calls this a "banking" concept and altogether rejects it. He criticises the traditional teacher's approach to preparation in which the teacher chooses the content, prepares it and then conveys it to the student. He says that by such a teaching process, the student may memorise the material but doesn't cognise it. He abhors the teaching of classics on the ground that these are not related to the world of reality, envisioned and experienced by students.

Regarding the second tenet-the classroom should provide environment of freedom in which the students' expressed interests and impulses give direction to classroom activities- Freire again vehemently opposes traditional education saying, "Traditional education anaesthetises and inhibits creative power". The dialogical education advocated by him is, instead, "constituted and organised by students' view of the world where their own generative themes are found."(Freire, 2002, p.109). In this method, subject matter of the classroom is manufactured out of the real life experiences and struggles of the students. Freire emphasises that the students experiences, problems and adversities, although incomplete and limited, must be the focus of attention, and not the 'external cast material imported by the teacher'. According to Shor, quoted by Sparks (p.5) "The teacher should 'situate learning in the students' culture, i.e. their literacy, their themes, their present cognitive and affective levels, their aspirations, their daily lives.'" (Shor, 1987, p.24)

For Freire the role of teacher is that of a 'partner'. (Freire, 2002, p.75).He says that a teacher will be taught by students, and not indulge in 'traditional education' which he calls an "exercise in domination". For Freire, a teacher's role is not that of a 'prescriber' or 'domesticator'.

There are three 'terms' used by Freire, that deserve special mention. These are: pedagogy, praxis or conscientisation, and revolution. Freire considers 'teaching' and 'instruction' to be tools for the revolution, not for the preservation of 'status quo'. It is an irony that traditional education and teachers have been encouraging the students to master certain subjects in the name of the same tools... It is noteworthy, that Freirean literacy training is a programme for radical political education, although a little bit of grammar and syntax instruction is a part of it. The educational

endeavour, according to Freire, must radically transform the political outlook of the students; then only it can be called the 'pedagogy of the oppressed.'

The second term 'conscientisation' means 'the gradual transformation of a person's view of life and that of the world from a kind of naïve consciousness to a critical consciousness.' In other words, it means "the ongoing process of action and reflection of people upon their world in order to transform it." For example, a Brazilian begins his view of life that is apathetic and fatalistic, guided by the view that the events happening in his life are under the control of some magical supernatural power. Critical consciousness, on the other hand, is a deep awareness of the cause and effect in social and political relations. It is a particular kind of awareness, involving a realisation in the illiterate peasant-learners, for they were Freire's original students, that their conditions of life might be improved if social and economic conditions can be altered by their political actions. It was this thinking that made Freire and his method beloved of all who had leftist tendencies, were convinced about the evils of Capitalism and hoped to engender a revolution on the Marxist lines. But, it is important to note, as Gerhardt writes, "He was not willing to Marxism or Existentialism because of some interesting points he found in the writings of these two authors." (p.3).

The third term 'revolution' may imply violence justified on the ground that the oppressed people cannot change their conditions by peaceful social or economic change.

Freire is of the view that the revolution sought out by the oppressed people will be vehemently opposed by the oppressor class and certain myths- private property is a must for human progress, industrious people can achieve economic well being and all men are created equal-will be propagated through families and schools to keep the status-quo of domination. The strategy Freire suggests for combating such an anti-revolution campaign is a sort of 'cultural revolution' with the aim of conscientisation of every one of the oppressed. In other words, Freire wants a complete remake of the society, where there are no oppressors and oppressed, no domination of any kind and pedagogy is the tool which has to achieve it.

It was assumed that the method would make literate forty million illiterates of the country, but the overthrow of federal government by military forces in March 1964 abruptly stopped the experiment. Freire was arrested and exiled for over 15 years. He worked in Chile for five years in the Christian Democratic Agrarian Reform Movement. In 1967 his book Education as the Practice of Freedom appeared; in 1968 he came out with much acclaimed and honoured book, Pedagogy of the Oppressed. In 1969 he was invited to the Harvard University as a visiting professor.

In 1970 he was invited to Geneva where he worked for 10 years as an advisor to the World Congress of Churches. In 1980 he could return to Brazil and joined worker's Party, in which he from 1980 to 1986 was the in-charge of its adult literacy project. In 1988 Freire was appointed Minister of Education for Sao Paulo. In 1991 an institute in his name was inaugurated

with the aim of 'fostering the new educational theories and concrete interventions in reality'.

Paulo Freire died of heart failure on May 2, 1997.

Representative Works: Education: The Practice of Freedom; Pedagogy of the Oppressed; Pedagogy of the Heart; Politics of Education.

The Critique

Freire's three tenets have been criticised by many scholars, although the scholars belonging to the Marxist stream have praised the method.

The criticism leveled against the first tenet, is based on the assumption that education broadens the mind and culture of the learner. According to Dr. John A. Sparks, "Freireans are, in effect, maintaining that a student in a modern classroom in Detroit, USA, or Rio de Janeiro, Brazil, cannot be expected to connect with Cicero's essay on 'Friendship,' the Book of Daniel in the Old Testament, or the Sermon on the Mount in the New Testament. They refuse to acknowledge even the possibility that the Western (read traditional) canon might have a universal appeal."

Sparks gives two additional reasons why students should have contact with traditional canon during their formative years. First is that by following Freirean method, the student becomes a victim of 'the provincialism of time' as T S Eliot did phrase it, meaning thereby that they know only their limited and narrow experiences, wherever they may be, and not provided the means to broaden their contact with the rich and vast world of faith, practice and thought that has preceded them. As Hirsch, quoted by Sparks, (p.4) says that students to whom knowledge is not transferred experience a kind of poverty of mind and spirit produced because they do not posses the "shared knowledge," the "cultural literacy" of their predecessors and therefore cannot stand on their intellectual shoulders.

The second reason is that such ignorant students become easy prey for those who propose shallow and illusory interpretations of the world. The followers of Freirean method will not be able to raise intelligent objections to poorly formulated ideas, opinions and propaganda, because of their lack of fundamental learning.

Regarding the second tenet of Freire, we note that he and his followers are loathe to inhibit students' interests and inclinations by the use of traditional methods, content as well as conventions. "Freireans believe that they can coax, out of each student, rudimentary, albeit often inelegant, knowledge that then can be shaped and polished into usable insights. The fact that these 'experiences' come from the young ignorant and even illiterate is not a matter of concern for Freire." (Sparks, p.8)

The problem is that the student's nature is neither better nor worse; his immaturity may take him to certain directions and ventures that may not be in the best interest of society and community. His impulses are often misdirected, short-sighted, unfocused, peripatetic, and in other words 'childish.' He is totally ignorant of certain disciplines, may know something of some others, but for being a part

of the community he needs direction, molding and corrections. His often naïve experiences are not the best material for instruction, as Freire asserts. And schooling, provided, it is not dead, removes his ignorance, takes him to a miniature society, expands his mental horizons, and makes him a member of the human stream. Student experiences the world and the conclusions drawn from them, regardless of whether they are labeled 'authentic' or not.

Researcher after researcher has proved the supremacy of structured, teacher-centered methods for the lower socio-economic status students. Harvard's late Jean Chall, quoted by Sparks (p.6), in 'The Academic Achievement Challenge," wrote long ago, "...the evidence on the superiority of structured, teacher-centered methods for low-socioeconomic-status children is so consistent over the years that it would be difficult to reject it."(Chall,135-152).

Lisa Delpit, quoted by Sparks (p.6), who worked among black children in urban areas, remarked in her 'Harvard Educational Review' article that her teacher preparation, which emphasised progressive tenets, did not produce the results she expected. Her conclusion was that black children need direct instruction and development of skills that the open or child-centered classroom did not provide. "Each year my teaching moved," she wrote, "further away from what I had learned (in graduate school) even though in many ways I identified myself as an open-classroom teacher. As my classroom became more traditional, however, it seemed that my black students steadily improved in their reading and writing."(Delpit, 381)

Roland Barth, quoted by Sparks (p.6), who worked in two city schools and employed progressive methods, found, that the experiment ended in failure. (Barth, 137-156).

The three educators, who had tried the Freirean method sincerely, were unanimous in arguing that the weaker students respond best to structure, order and guidance through well ordered material.

Says Sparks, "Freirean pedagogy may actually produce meager learning results that will tend to keep disadvantaged students exactly where they are; that is, in the grasp of ignorance, low productivity and poverty. The irony is that the Freireans are dedicated to helping the poor and disadvantaged, and sincerely so. However, well-meaning and good intentions are not enough. The methods must produce real learning; if they do not, one must not be afraid to return to greater structure, the directness of carefully organised instruction with traditional content and methods." (Sparks, p.6)

The third tenet of Freirean method is that the teacher's role should be reduced to that of the 'partner' instead of the traditional one, that is of controller, guide and one who directs the educational activities of the students. Freire vehemently criticised the traditional teachers calling them 'bank clerk teachers', whose only roles are that of prescribers and domesticators .Later, Freire corrected his viewpoint saying that "I do not think that there is real education without direction...There is no educational practice that does not point to an objective.."(Freire and Macedo, 1995, p.2). But Freire thought that

teacher is a 'liberator', and liberates his students from the clutches of Capitalism and its accessory, exploitation.

A traditional teacher has authority, derived from educational need. The student is a developing individual, with exuberant energy and imagination, but they lack direction moral sense and discipline. A student needs control, so that his energy and abilities are given proper direction, lest it may go waste. Traditional education disciplines the student for freedom, not for slavery. The moment the student has the grasp of method and the direction, he is asked to experiment, have variety of experiences and travel on his course. Good teachers, usually disciplinarians, have always been loved, because they controlled, disciplined, directed and gave freedom to the students, when needed. The art of a teacher lies in finding the proper moment and giving the student proper treatment.

There is another experiment which shows that the third stage usually does not follow the second one. K.O.Ojokheta, who investigated the application of Paulo Freire's literacy training methodology in three carefully selected basic literacy centers, one situated at Ibadanland, Oyo State, Nigeria, managed by the Baptist Mission; second at Department of Adult Education, University of Ibadan; and the third at Iddo community, Iddo Local Government Area, organised and sponsored by Oyo State Agency for Adult and Non-formal Education. Three teams comprising four postgraduate students who had undertaken a course on Philosophy of Adult Education, served as research assistants and facilitators for the study.

In the first stage of the study, 18 participants of different ethnic and cultural backgrounds of the first center focused their discussion on leadership corruption, 20 participants of the second center focused on mismanagement of the nation's resources, and the 20 participants of the third center focused their discussion on political crisis in states.

At stage two, the facilitators, on the basis of the discussion among the learners, selected the Generative words. These were resources, money, abundance, crude oil, stealing, pocket, begging, plenty, poverty, suffering, frustration, crying, hunger, crisis, dying, and death.

These words were then depicted in pictorial form showing the concrete realities and situations in the lives of the people. The pictorial display provoked an emotional outburst among the participants, showing pity and anger, and asking why! Why! Why!

After the completion of second stage, it was found that no participant wanted to go further, that is for literacy training. The major finding of the study was, "When the political consciousness of the learners is raised, they may not be patient enough or be interested in the acquisition of literacy skills since the first two stages may have thoroughly conscientised and sensitised them to the realities of their lives." (Ojokheta, p.6).

Freire was a sensitive personality. As Rosa-Maria Torres remarked once in an article, 'The Million Paulo Freires', "Freire was sensitive to both criticism and self-criticism around his work. In numerous opportunities he acknowledged naïveté, subjectivity, ambiguity, and lack of political-ideological clarity in his early

writings, and a margin of personal responsibility in what he perceived as 'appropriations' or false interpretations of his ideas. In particular, he referred many times to the naïveté of his initial notion of 'conscientisation'. 'I was ideologised as an intellectual petite bourgeois,' he admitted in 1973. 'I started to worry about the term conscientisation. The corruption that word suffered in Latin America and in Europe was such, that I have not used it for the last five years.' He said in 1974. 'A less naïve reading of the word does not yet imply a commitment with its transformation, much less transformation as such, as idealist thinking might pretend.' He insisted in 1986, when he received UNESCO's Education for Peace award in Paris." (p.3)

When Freire took the post of Secretary of Education in State of Sao Paolo, his department and NGOs working in the area of primary education, found the retention rates of the state's primary schools improving from 79.46% to 87.7%. This was achieved through engaging in a dialogue with the communities of Sao Paolo and by removing the barriers separating the school and the community.

Freire was a citisen of the world but his name was closely linked with the countries of Latin America or particularly with Brazil. Freire has been the object of both the warmest reception and the hardest criticism. In life and in death, his ideas and positions generated and will continue to generate strong sentiments, passionate adherents and rejecters, very different and even diametrically opposed interpretations.

In answer to question, 'What legacy did Paulo Freire leave us?' Monacir Gadotti, General Director of Paulo Freire Institute, and Carlos Alberto Torres, Director of Paulo Freire Institute, wrote: "In the first place Paulo Freire leaves us with a life, his biography. Paulo enchanted us with his tenderness, his sweetness, his coherence, his commitment and his seriousness. His words and actions were words and actions of struggle for a world 'menos feio, menos maivado, menos desumano' (less ugly, less cruel, less inhumane) as he used to always tell us. Living from the perspective of love and hope, he also leaves us a legacy of indignation to injustice, which he used to say we could not speak about with sugar coated words. In addition to the testimony of a life of commitment to the cause of oppressed peoples, he leaves us with an immense body of work, transmitted through many additions of books, articles and videos which are found throughout the world." (p.2)

We may agree with Rosa-Maria Torres, when she summed up the life and works of Paulo Freire, in her article saying, "In fact, rereading Freire is always finding something new. But to find something new, one must have advanced oneself since the last reading." (p.8). In the same spirit, Shelley Walia remarked about Freire's contribution, when she wrote, "His contribution to pedagogy will be reinvented and reinterpreted, redefined and recontextualised as long as we remain involved with new teaching and learning." (p3)

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Book Review

Some Aspects of Islamic Studies

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The 'Islamic Studies' is an ambiguous term as it has different connotations in the Islamic and Western contexts. In the Islamic context, the term is used to describe virtually all the academic discourses including traditional form of religious thought such as Islamic theology, Islamic jurisprudence and some other areas generally considered to be 'secular' in the Western context such as Islamic science and Islamic economics. In the non-Muslim context, 'Islamic Studies' generally refers to the historical study of Islam, Muslim culture, Muslim history and Islamic philosophy. A vast number of treatises have been written employing both the traditions by scholars across the globe. The book under reference, Some Aspects of Islamic Studies, is an attempt by Dr Afroz Ahmad Bisati to deal with the subject in the Islamic context covering varied issues including 'secular' ones. He has discussed some important matters of contemporary relevance in this small book containing ten chapters.

The first two chapters namely, 'Teachings of Islam' and 'Islamic Character', deal with various questions concerned with the lives of every human being. Quoting extensively from the Quran and the Hadith, the aspects of justice, liberty, equality, tolerance, relations with relatives and neighbours, respect for life, respect for feelings and emotions and respect for parents and elders have been aptly elucidated upon. How seemingly trivial matters have been given immense importance in the teachings of Quran has been nicely explained in the following example: "Do not expect always others to come to you, but try to take initiative to visit others. This strengthens social relations. Avoid visiting others at late night as this may disturb their privacy and comfort" (p-13).

The significance of values such as faithfulness, honesty, obedience, politeness, mercy and discipline in social life has been well explained with examples drawn from basic principles of Islamic teachings in the third chapter 'The Human Values in Islam'. The examples have been drawn from the daily offerings of prayers five times a day: "Standing in perfect row, shoulder to shoulder with poor and rich inculcates the values of discipline, unity, equality and cleanliness

amongst the faithful." This has been further explained while describing the significance of another principle of Islam, i.e. Zakat, which means purification. "It sows the seed of kindness, sympathy and benevolence. It reminds people of the needs and concerns of others and thereby makes them merciful, honest and thankful towards the bounties of God. Similarly by fasting a person controls one's desires and distances oneself from prohibited things" (p-26).

'Human Rights in Islam' is the theme of the fourth chapter which covers a description of wide range of rights of an individual. Starting with the concept and its importance, the author has enumerated various human rights and has explained the manner in which these rights have been given significance in the teachings of the Quran and the Hadith. He has tried to emphasise with logic that these rights can not be abrogated by any individual since the origin of human rights in Islam is divine. While emphasising the rights of women, slaves, children and the rights to life and property, the author has quoted from the 'Farewell Sermon of Prophet', which is a milestone in the history of human rights in Islam. The Hanafi School of jurisprudence has also laid great emphasis on this issue. According to it, as quoted by the author, "The Government cannot acquire the property of its subjects unlawfully" (p-41).

An issue of far-reaching consequence i.e. 'Status of Women' is the theme of the fifth chapter, which seeks to clarify misunderstandings with regard to the image of women in Islam. Comparing with the conditions of women during pre-Quranic times, the author has delineated the emancipated position of women after the spread of Islam. Drawing references from the Quran, he has described many rights of women such as equality in status, right to inheritance, freedom of marriage, etc. bestowed upon them. Quoting from the sayings of the Prophet, he says, "Man and woman have many mutual rights. They both have right to equal status and have equitable right of inheritance. They have right of freedom in marriage and can select or reject their prospective spouse according to their will" (p-58).

Chapter seven 'Islamic Concept of Knowledge' highlights the importance attached to 'ilm (knowledge), which is not simply knowledge but an all-embracing term covering theory, action and education. It has been pointed out that in the Quran itself there are a total number of 704 verses where 'ilm or its derivatives and associated words are used, thereby manifesting the importance of 'knowing' and 'understanding'. The author also highlighted the distinctive features of the approach of the Quran which lays emphasis on experimentation and observation. It provokes a Muslim to study the universe and find answers to why, how and what. It does not encourage blind imitation (p-77).

Chapter eight 'Economic Teachings of Quran' has references from the Quran, the Hadith and the works of Fiqh (jurisprudence) discussing economic resources, the acquisition and disposal of private property and the purchase and sale of merchandise. The redistribution of wealth through various forms of taxation and zakat (which means purification of one's wealth by giving alms to poor according to Muslim law),

the borrowing and lending of money, the provision for the care and protection of elderly and economically deprived section of the society have also been discussed comprehensively. It has been pointed out that while carrying out various economic activities, Islam has emphasised that we 'to spend to improve the environmental conditions' (p-84).

Chapters six, nine and ten viz. 'Introduction to the Quran', 'Introduction to the Hadith' and 'Introduction to Fiqh' explain in detail about the divinity of the Quran and its revelation to the Prophet, meaning and importance of the Hadith and the meaning of Fiqh (jurisprudence) respectively. While discussing the Quran (revealed to Prophet Muhammad) in chapter six, the author has also delved upon the earlier divine books i.e. the Tauret (i.e. Hebrew Torah) revealed to Prophet Moses, the Zabur revealed to Prophet Dawood (David) and the Injil revealed to Prophet Isa (Jesus). It has been further explained that the Tauret is an Arabic equivalent which was actually revealed in Hebrew language. The Zabur, generally translated into English as 'Psalms' (sacred songs or hymns), contains praise of God in the form of hymns. The author has also dilated upon many modifications made to Injil (meaning Gospel, the religious doctrine reached by Christ) which now has twenty-seven versions. He has thus opined that Injil has not maintained its originality and authenticity.

Chapter nine is 'Introduction to the Hadith', explaining in detail the meaning and connotations of the word. Besides giving details of the process of compilation and preservation, the book also provides details about different types of the Hadith (which means traditions with regard to sayings and actions of the Prophet). It mentions about some of the earliest and authentic compilers of Hadith as well as their method and strict rules adopted by them for compiling the Hadith. The author has also provided a list of important Hadith collections and a brief description about them.

'Introduction to Fiqh', the last chapter of the book, throws light on the meaning and significance of Fiqh (jurisprudence), a special area of understanding in the Islamic context. Fiqh is that branch of knowledge which deals with the issues related to shariah, covering all aspects of religious, political and civil life with regard to laws of inheritance, property, contract, criminal law, constitutional law and the laws related to various phases of administration (p-104).

The book is certainly a must-read for all those interested in knowing the Islamic perspective on various aspects of human society in general and Muslims societies in particular. The author has tried to cover a vast range of issues in this small book, therefore, obviously it was not possible for him to include all the minute details of a vast subject such as 'Islamic Studies'. If any shortcomings are to be pointed out, there are some typographical mistakes and breaking up of lines but this does not in anyway impede reading or mar the interest of the reader. A concise list of further readings has been provided at the end for those who are curious to study Islam.

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