Science Education for Multilingual and Multicultural Contexts

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Abstract

Society is changing fast with innovations and changes in communication process. Inventions in scientific world have affected this process to a great extent. We are finding tremendous movement in globe for education and employment more than ever before. Educational opportunities are now at the door step of every individual interested. This is increasing the cultural diversity of the society. Everywhere we are finding people coming from different regions speaking different languages and following different cultures. Cultural diversity is also recognized as an important aspect of education system of present day. Heterogeneity is there in natural way in achievement, understanding capacity, interest, attitude and grasping capacity of the students. In addition to this now a days one is witnessing students representing various cultures, regions of the globe. This makes the teaching learning atmosphere complex as teacher has to take care of different needs of students with varieties of backgrounds. In particular dealing with subjects like science in culturally diverse classroom is a daunting task for teacher. As such the subject needs special requirements to make its concepts clear to students. Reports of commissions and committees are focusing on lack of active learning environments, distancing from surroundings, and absence of joyful learning opportunities as responsible for gradual decline in students to come to study in basic science. Further the cultural diversity speedily coming into the classroom is complicating the situation. Is there a need to change the teaching learning drastically? Or the measures being taken to improve science teaching are providing scope to take care of multilingual and multicultural aspects of classroom are some of the aspects being discussed in this paper.

KEYWORDS: Multiculturalism, Multilingualism, Educational Context, Science Education

Introduction

Dropping student rates at university level basic science courses is an alarming situation that needs quick address. Once out of school, students more prefer to join professional courses or specialized subjects but not the basic courses. This could be attributed to lack of opportunities at later stage and also to some extent the way science is being taught at schools. National Curriculum Framework also opined that science education needs to be more related to the context of the child. The philosophy of science is best understood with exposure to basic courses at school and later exposure to college level courses make students capable of applying their knowledge learnt at school. Students with best academic background if opt for these courses, the dearth of good teachers that is being faced at school level can be reduced to some extent. The negative aspects of school
science education could be reduced by employing teaching learning catering to the needs of heterogeneous student population. Language suitable to the needs of classroom is one such need. The present paper is focusing on this aspect.

**Multilingualism**

Multilingualism is associated with use of two or more languages for communication in a given context. It could be an individual speaker using different languages in his living context; a group of people using more than two languages to communicate or languages used among different language speakers to communicate. The speakers may be fluent in spoken communication or written communication or in both. There is no clear-cut definition of the term regarding the extent of fluency one can expect from a so-called multilingual person. Some argue for complete dexterity and fluency, while others for minimal standards of use. But in general, the belief is that people who can master more than one language can possess higher cognitive proficiency than monolinguals. Children are found to possess better language learning capacity than elders. They acquire the languages spoken in their context naturally and can speak normally as natives. If academic aspect of language learning is not taken proper care, then mastery of language is under question. That is why we find many migrant populations failing in academics due to lack of support from family and schools. Parents who are literate in their mother tongue can help their children acquire the contextual languages in a better way. In addition, brain development is also found to be playing a definite role in language acquisition. In the present globalized world, multilingualism is a reality due to mixing of people for survival.

**Multiculturalism**

Multiculturalism is existence of more than one culture in a given context that is affecting the functioning of the context to a sizeable extent. In the older concept of survival of society, it is always acculturation of people in to dominating culture. But with change in ideas and ideals, the aspect of looking at multiculturalism has also changed. Now it is more concentrating on mixing of different cultures without losing identity of own. It can be defined as, “multiculturalism is the study of how individuals from different ethnic, minority, or rural backgrounds receive, analyze, and respond to information that is presented to them. The principle of cultural diversity takes multiculturalism a step further, changing the mainstream approach so that the different ways of receiving, analyzing, and responding to information are all seen as being “culturally competent.” (Ted Pinnock, Esq.) Even governments are recognizing this aspect and are making special provisions for catering to the survival needs of these groups in the society. People across the world are also coming to terms with this aspect of accepting people from different cultures for one reason or the other.

**Changing Philosophy of Education**

Education is now viewed as a tool to bring awareness in people about each and every aspect of life. It is for everyone. Teacher is not the only source of provider of awareness,
but there are many other sources ranging from family to technology. Parents expect
school to be an importance place where their wards will be made aware of everything.
They have great expectations from this institution in shaping up the future of their child.
Education is not to be imparted separate from life, all the teaching learning is to be close
to the contextual reality of the child. Then only one can expect the proper application
of the knowledge for survival from students. With these changing views Indian education is
now experimenting with active and joyful learning, practicing constructivist approach,
integration of technology in teaching learning to a great extent.

Philosophy of Science

Science is searching for truth in general sense. In academic sense it is making the truth
visible to all in a rational way. It is dealing with facts, laws and theories related to
universe, earth and life in general that can be proved through experimentation. Ideas are
put forward with rational arguments, logical flow of words, facing criticisms with
grit, proving one’s strength with patience – all form part of this experimentation. One needs
to possess faith in taking up the process and patience in completing with success. The
fact proved, laws discovered may not go in accordance with contextual reality, but a
researcher need to possess the courage to put forward the truth to world.

Science Education

Science education deals with inculcating all these qualities in students to full extent.
Starting from school to higher education level all the aspects related to imparting
education in this subject has to be clear about this aspect. Particularly teacher training
programs have to take care of providing all the facilities to impart the qualities required
in the trainees, so that they can train the future generations. Experimentation skills,
process skills, scientific attitude, logical analysis, rational thinking are to be developed by
exposing students to carefully planned teaching learning at all stages. Providing a clear
understanding of contextual reality is quite necessary to apply the learnt skills properly
for future life.

Contextual reality

India is the second most culturally, linguistically and genetically diverse geographical
entity after the African continent. India's Republican democracy is premised on a national
belief in pluralism, not the standard nationalist invocation of a shared history, a single
language and an assimilationist culture. State boundaries in India are mostly drawn on
linguistic lines. In addition India is also one of the most religiously diverse countries in
the world, with significant Hindu (80.5%), Muslim (13.4%), Christian (2.3%), Sikh
(2.1%), Buddhist, Jain and Parsi populations. Cities like Mumbai in Maharashtra display
high levels of multilingualism and multiculturalism, spurred by political integration after
independence and migration from rural areas. (Source: Wikipedia Website)

Due to constitutional measures taken to provide equal opportunities to all for education
and employment, marginalized sections are mainstreamed to some extent. In search of
education and employment opportunities people are now moving to different parts of country and even outside the country. There is mixing of people in social gatherings, official institutions on official and non official matters. Our belief in ‘unity in diversity’ is more represented in all contexts to a greater context.

The multicultural and multilingual contexts that are natural to Indian context are recognized well by officials and due representation is being given at all possible places to propagate the feeling of nationality in proper way. Efforts are there to celebrate each festive occasion by all. But cultures are very complex, and generally are transmitted through close family and kin relations. The government view of cultures as being about festivals and cuisine is a crude oversimplification that leads to easy stereotyping. Participation of people may be due to officiality involved than enthusiasm and interest to know and mix with others.

This social change is also represented in the process of education. A class teacher now needs to cater to heterogeneity coming into the class room due to above said situations. There are students from many regions, religions, languages, mental capacities, interests and attitudes. A teacher should possess knowledge and skills to tackle with all these situations. But a normal situation visible in the present school context is parents opting for education in English medium rather than their own mothertongue or regional languages basing on many considerations. Then also it is necessary for a teacher to take care of cultural diversity exisiting in the classroom.

Importance of mastery over science subject is best understood to parents of present generation. Good percentage of marks in mathematics and science open doors of world to a student. So there is more emphasis on teaching of these two subjects along with English. They help in mobility and best employment opportunities for children. But day to day situations in school teaching are giving a bleak picture of the situation. Teacher is still following traditional way of teaching due to many constraints and practical approach is neglected aspect. National Curriculum Framework 2005 also lamented on the lack of proper teaching practices and giving education of science in absence of context. In these situations how to look for combining the realities of multiculturalism, multilingualism and best teaching practices is the question to be answered.

Amalgamation Possibility

Use of technology in Teaching-Learning: learning in mother tongue always facilitates clear understanding of the concepts. It may not be possible all the time to get education in case of migrants children. They have to opt for a medium that is away from their own spoken language. Integration of technology in teaching of subjects is still in its initial levels. But it is thought of as a best method to teach subjects like science and maths. So teacher when expose students to multimedia packages available in different languages the problem of clarity can be solved to some extent. We can find many web pages in this manner offering the information in many languages, where switches are provided to shift to preferred language. As far as possible teacher has to take care of cultural specificities existing in the class while teaching, providing examples from various contexts.
Providing opportunities for learning of languages: Research is proving cognitive efficiency is somehow related to multilingual nature, if schools provide the opportunity to learn more than one language from early stages the learning problems can be solved to great extent at later stages. Children can grasp language more quickly in their primary stages of school than at later stages. Concept clarity in subject is clear because of the mastery in languages when coupled with availability of multilingual packages.

Training to teacher in innovative and practical teaching methods: all the schools may not provide the excellent facilities as visualized in documents. But if teachers are provided training to make best use of available materials to make teaching aids, models and opportunities to experiment with in the traditional aspects of classroom situations, the objectives of joyful, active learning set for science can be achieved.

Changing Focus of Teacher Training Programmes: Training needs of teachers can be better addressed if training programmes focus to change the way teaching of Science is carried out in traditional classrooms. There should be more scope to involve student teachers to practical aspects than spending time in classrooms. Science labs needs to be developed and all methods of teaching science are to be experimentally taught to the students. Field trips and informal learning opportunities are to be provided to students.

Involving cultural aspects to understand nature: Each culture has its own customs that sometimes appear to be very inquisitive to people. Like, food habits, ways of performing certain rituals etc. are contextual specific. The offerings that are given to Almighty are also different basing on the food available in one region. Often we find that the things that are considered auspicious and useful for consumption are not the same for other regions. Every custom and ritual has a sense related to its context. If these aspects are made known to students, science learning remains a joyful and fruitful experience, because everyone is sharing their views and experiences in the process. It automatically develops the confidence and equality aspect in teaching learning in the heterogeneous classrooms. Children can understand their environment and nature in a better sense and develop adaptation skills with other cultures. It is multi-purposive activity if implemented with proper sense.

Innovative Evaluation systems: provide opportunity for children to write exam in the language of their choice. Provide different types of tests in place of paper and pencil tests. On-line exams if developed in different languages can solve the problem to some extent.

Looking for alternative learning opportunities: not only children adults also need exposure to this aspect. At higher education also, some alternative opportunities are to be there to students to study these aspects. Integrating these aspects in science and arts streams is not difficult if proper thinking is given. This will provide situations where all get exposure to these aspects. Development of on-line courses is one best option. Formation of groups with language and science combination can enhance the learning opportunities for students.
Conclusion

It is not possible to visualize a specific academic program considering cultural diversity as culture and language are inherent qualities of a person. They influence the life of people from many fronts. Particularly considering the average Indian classroom, it is not expected on large extent, but to the extent possible teacher has to develop the attitude of catering to the differential needs of students coming from divergent cultures. Language being the medium of communication to provide knowledge of science, teacher has to use the medium effectively. Considering the heterogeneity existing in classrooms in the form of region, language and culture utilizing the multicultural and multilingual opportunities to teach content can be a novel idea. Objectives and modalities of such programmes need to be worked out carefully to achieve the objectives of education in global world.

References


