



## **Teachers of Gifted in Science**

**Priya Khurana**

*Assistant Professor, Department of Education, Aditi Mahavidyalaya, University of Delhi*

**Bhaskar Mohan Kandpal**

*Assistant Professor, Department of Chemistry, Shivaji College, University of Delhi*

### **Abstract**

*Giftedness in science has existed in classrooms and it poses special demands on the science teachers. To address major challenges of identifying and nurturing gifted and talented in science, the teachers need to be equipped with adequate strategies to create suitable learning environment. They need to be actively involved in making science relevant and challenging for their learners. A lot of support is thus expected from teacher education programmes so as to ensure that the teachers feel proficient enough to meet the diverse learning needs of the gifted, with responsibility. This paper intends to critically look at the teacher education programmes with special reference to exploring possibilities and opportunities provided to future teachers in order to endow them in promoting gifted and talented in science. Hence, different aspects of teacher education programmes of two central universities in India and one state university are thoroughly examined. Investigation reveals that promoting and sustaining giftedness in classrooms does not form an inclusive part of the total teacher preparation programmes and that most of the sensitization of future teachers depend upon the teacher educators' own initiation.*

**Key Words:** *gifted, science, teachers & teacher education*

### **Introduction**

The education of gifted children in India is a critical issue. The most essential concern amongst the majority educators is the identification of the gifted (talented), understanding their needs and suggesting suitable ways to nurture them while being in the mainstream. According to Deo and Pawar (2011), irrespective of caste, creed, race, geographic location and

socio-economic status, 'creativity' is evenly distributed. It is difficult to quantify creative (gifted) children. However, a good assumption is that creativity shows normal distribution still it is of important concern here that they have a different mindset and cannot be spotted exclusively through prevailing conventional examination-based systems, which predominantly test scholastic abilities. The great majority of India's primary and secondary schools offer standardized one-size-fits-all pedagogies in their classrooms, neglecting the special needs of gifted children. Usually teachers cater to the middle and overlook those with above average ability. Lack of classroom stimulation and unchallenging curriculum atrophies the learning skills of gifted students.

In order to address the issue of nurturing gifted in science, it needs to be acknowledged that science teaching is a complex and highly skilled activity which requires science teachers to have a scientific temper, problem solving skills and be proficient enough for managing time, material resources and human personnel. Effective science teachers, know their learners and facilitate the construction of scientific concepts among them. They are self-motivated and constantly update themselves about contemporary trends and practices in scientific, pedagogic and curricular developments. They ought to be decision makers who employ knowledge of science, pedagogy and continually modify to fulfill their individual responsibilities.

### **What exactly is the problem?**

With the Government of India's effort to provide free and compulsory education to all irrespective of their caste, creed, culture, strata, gender etc in the mainstream schools i.e. with the 'Right to Education Act 2009' being implemented in the schools the responsibility and the challenges of the teachers have indeed enhanced manifold. Moreover there are many other issues and challenges of teaching gifted in science. Making science relevant to the lives of students requires, among a variety of other factors, a classroom environment in which the students can be actively involved in making meaning of the information within a relevant context. Teachers need to learn to create a suitable instructional/learning environment and employ strategies that encourage active questioning, identification of issues and problem solving by students. They are expected to encourage students to challenge the information presented and discuss its personal relevance for each one of them. Development of these abilities requires carefully designed, sustained, long-term professional development opportunities that actively involve both teachers and students in the learning process.

However when talking of nurturing gifted (talented) in science, Contextualizing instruction in science is a fundamental task. Contextualizing science instruction involves utilizing students' prior knowledge and everyday experiences as a catalyst for understanding challenging science concepts. A study by Rivet and Krajick (2008), provided evidence which support claims of contextualizing instruction as a means to facilitate student learning, and point toward future consideration of this instructional method in broader research studies and the design of science learning environments.

To be able to utilize students' prior experiences, it is important to understand what prior notions teachers carry about their students' previous knowledge in science. Pre-service teachers often enter teacher education courses with pre-conceptions about teaching and learning that may or may not be consistent with contemporary learning theory. To build on pre-service teachers' prior knowledge, we need to identify the types of views they have while entering teacher education courses and the views they develop throughout these courses. The study by Otero and Nathan (2007) indicate that pre-service teachers exhibited a limited number of views about students' prior knowledge. Pre-service teachers face many challenges as they learn to teach in ways that are different from their own educational experiences.

These aspects altogether indicate a great deal of onus on the science teacher preparation programmes. The teacher education programmes are thus expected to ensure that the teachers are ready enough to meet the diverse needs of the gifted learners, with responsibility.

### **Research Question**

To critically examine the teacher education programmes with special reference to exploring possibilities and opportunities provided to equip the future teachers for nurturing gifted in science.

### **Research Methodology**

In order to understand the issue in question the teacher education programmes of two central universities in India and one state university were thoroughly examined. The study was exploratory in nature. It involved analyzing curriculum of the teacher education programmes including field observations, administering questionnaires and conducting interviews. The analysis of data was majorly qualitative in nature.

## **Results and Discussion**

Different aspects of teacher education programmes of two central universities and one state university in India were thoroughly examined in order to understand the opportunities provided to pre-service teachers during their duration of the course. The teacher preparation i.e. Bachelor of Education (B.Ed) course offered in these universities is of one year duration. But the effective contact time of the student teachers and the teacher educators is far less than one year due to many reasons. Not only the range of vacations during the course reduces the contact hours between the student teachers and teacher educators but the effective learning time itself is an issue. Moreover the courses offer very less or minimal exposure to student teachers about managing gifted students in an inclusive mainstream set up. The Educational Psychology paper touches upon the issue of identifying children with various special needs including gifted children but the actual classrooms are full of learners coming from so many diverse backgrounds and needs such as social, emotional, physical, cultural, educational etc., that the very generic information provided during this paper usually proves quite inadequate to prepare the future teachers to deal with complexities of classroom life. Next, there are optional courses which discuss the details about 'children with special needs', which very few student-teachers choose.

Furthermore the methods/ pedagogy papers do not offer any specific exposure or orientation to the student teachers towards the issue of nurturing gifted in their regular mainstream classrooms. The student teachers when they enter the classrooms are completely unaware of the diversities they are going to come across. The pedagogy paper in different subjects does not prepare them in a competent enough way to deal with identifying and nurturing gifted/talented within specific subjects. More so when it comes to science subjects, one would agree that there are children who are exceptionally curious and innovative in their explanations of the scientific phenomena around them, ask many questions out of the box, have many queries and have so much of their own experiences of the physical world around them. The needs of this smaller but precious group of students thus are often sacrificed to the compelling needs of the larger group of the children who find understanding science difficult.

The school internship programme during the course, do not have any specific focus on exposing student-teachers to the group of high ability students in their subject and the other co-curricular activities are also least oriented to even familiarize the future teachers with special needs of gifted students in school.

## **Conclusion**

The analysis reveals that promoting and supporting giftedness in classrooms does not form an inclusive part of the pre-service teacher preparation programmes. The teacher preparation curriculum of these universities seem inadequate in terms of providing the student teachers with minimum basic knowledge about gifted children and ways to nurture them in their regular science classrooms. Even if some of its components are found, they are given in a scattered manner, completely depending upon the orientation of the teacher educators teaching that course. It is indeed a point of utmost concern that the initiation of the future teachers depend upon the teacher educators' personal notions. This makes a special demand on the teacher educators also, more specifically on those who are teaching pedagogy courses.

## **Implications**

Considering teachers as the most important component of quality schooling makes it essential to continually upgrade the quality of teachers through a variety of mechanisms. Apart from addressing the issues such as quality, access, appropriate instructional strategies and the evaluation of students, the teacher preparation programmes need to stress upon preparing specialist teaching faculty in science (CABE Report, 2005). It is an essential requirement today that the future teachers completing these courses must feel confident and competent to handle diversity, particularly gifted children in an inclusive classroom setup. It is strongly recommended that the courses on gifted education form a compulsory part of the teacher preparation programmes. Especially the content of various methodology/pedagogy papers in all the subjects need to be reviewed in order to address needs of gifted children in particular subject areas. Various workshops and in-service programmes may also be planned for the teacher educators working in these teachers preparation programs to sensitize them towards the learning needs of the teachers and help them address those issues within their own classrooms situations. The National Curriculum Framework for Teacher Education (NCFTE, 2009-10) suggests, "Teacher education as a whole needs urgent and comprehensive reform". However, this change is not envisaged overnight but what is required is an unambiguous commitment to a policy framework that will be necessary for translating this vision on the ground. Nurturing giftedness can no more be seen as an elitist agenda, it must form a compulsory part of the teacher preparation programmes at all levels.

## References

- [1] *CABE Committee Report on Universalization of Secondary Education (2005)*, Ministry of Human Resource Development: New Delhi.
- [2] Deo, M.G. & Pawar, P.V. (2011), General Article: Nurturing Science Talent in Villages, In *Current Science*, Vol. 101, No. 12, pp1538-1543.
- [3] *National Curriculum Framework for Teacher Education: Towards Preparing Professional and Humane Teacher (2009-10)*, NCERT: New Delhi.
- [4] Otero, V.K. & Nathan, M.J (2008), Preservice Elementary Teachers' Views of Their Students' Prior Knowledge of Science, In *Journal of Research in Science Teaching*, Vol. 45, No. 4, pp 497-523.
- [5] Rivet, A.E. & Krajick, J.S. (2008), Contextualizing Instruction: Leveraging Students' Prior Knowledge and Experiences to Foster Understanding of Middle School Science, In *Journal of Research in Science Teaching*, Vol. 45, No. 1, pp 79-100.
- [6] *Right to Education Act (2009)*, Government of India.

