



## Recent Initiatives in Teacher Education

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### Abstract

Our imperfect world is advancing relentlessly towards uncertain future scenarios, and we must try to redirect it towards sustainability, that is, towards a new way of doing things in order to improve our environment while at the same time achieving justice, social equality and economic stability; however, the change is impossible without learning.

Teachers are considered to be, gurus. Guru's role is of higher ecstasy. In order to serve the society this is the best way to teach. A teacher is a great personality if he/she renders her/his job perfectly. Teachers are the creators of the society. Society provides all the facilities to the teachers. There are various courses and programmes to promote and train the teachers in order to make great citizens. It's a noble profession. The teachers must be trained properly. There are various techniques and methods of teaching, innovations in teaching all these come with the training. Teacher education in India can be divided into two broad areas - pre-service education that is focused on preparing students for a career in teaching and in-service teacher training that is provided by the government through the SarvaShiksha Abhiyan (SSA) or NGOs and social enterprises. The focal importance of teacher in the total educative process is not new to educational thinking. Nevertheless, with the changes in theory and practice of education, the concept of teacher preparation has undergone a considerable change. With the advent of a broader concept of education including within its fold the total personality of the educand and aiming at his all-round development, the functions and responsibilities of the teacher have increased manifold. There has, therefore, been a shift in the character of teacher preparation from one of apprenticeship to one suited to a profession.

The replacement of the word 'education' for 'training' in recent years in connection with the preparation of teachers is implicitly analytical of this shift in stress, Teacher education, therefore, is a term rather recent in its origin. In the broader sense 'teacher education' refers to the total of educative the focal importance of teacher in the total educative process is not new to educational thinking, but, with the changes in theory and



practice of education, the concept of teacher preparation has undergone a considerable change. With the advent of a broader concept of education including within its fold the total personality of the educand and aiming at his all-round development, the functions and responsibilities of the teacher have increased manifold. There has, therefore, been a shift in the character of teacher preparation from one of apprenticeship to one suited to a profession. The substitution of the word 'education' for 'training/' in recent years in connection with the preparation of teachers is implicitly indicative of this shift in emphasis, Teacher education, therefore, is a term rather recent in its origin. In the broader sense, 'teacher education' refers to the total of educative experience. This contributes to the preparation of a person for a teaching position in schools, but the term is more commonly employed to designate the programme of courses and other experiences offered by an educational institute for the announced purpose of preparing persons for teaching and other educational service and for contributing to their growth in competency for such service. Such teacher education programmes are offered in teacher's 2 colleges and normal schools and in colleges and universities. This paper highlights the various new initiatives that the government has taken. It also focuses on the rethinking of the teacher Training programmes. This paper also throws light on recent scenario of the education system. It also suggests improvement measures needed for the teacher education.

Key Words: growth, contemporary, virtual, value E-learning

## Introduction

An educational institution performs a significant role of providing learning experiences to lead their students from the darkness of ignorance to the light of knowledge. The key personnel in the institutions who play an important role to bring about this transformation are teachers. As stated by NCTE (1998) in Quality Concerns in Secondary Teacher Education, —The teacher is the most important element in any educational program. It is the teacher who is mainly responsible for implementation of the educational process at any stage. This reflects the importance of teachers in our education system. It is advisable that if we invest in the teacher's development then it is fruitful and as a result the future of our country is protected. We all know that education has been regarded as one of the oldest and most respected profession not only in India but also in other countries of the world. Though the system of education has undergone various changes and it has transformed tremendously in our country. It was prevalent during the pre independence period too but now there are drastic changes. The changes that have come are related to rules, policies, teaching-learning processes, instructional strategies, school environmental conditions and the terms and relationships between the students and the teachers. Since this profession is regarded as the noble profession, the teachers were



revered and appreciated within the society. The job duty of their selection was implemented with utmost diligence and resourcefulness. It was ensured that they acquire the required qualifications and would be able to meet the favorite objectives. In pre-independence India, the area of teacher education was given recognition. It was believed that when the teachers would possess adequate skills and abilities, only then they would be able to impart satisfactory knowledge to the students and promote well-being of the community. The main areas that have been taken into account in this research paper include history of teacher education in India, preparation of teachers in the pre-independence India, the Upanishad Period, the Buddhist period, the medieval period, and the modern period. Before proceeding to the overview first of all it is necessary to understand to know the meaning and nature of teacher education.

## **Meaning and nature of Teacher Education**

### **Meaning of Teacher Education**

It is well known that the quality and extent of learner achievement are determined primarily by teacher competence, sensitivity and teacher motivation.

The National Council for Teacher Education has defined teacher education as – A programme of education, research and training of persons to teach from pre-primary to higher education level. Teacher education is a programme that is related to the development of teacher proficiency and competence that would enable and empower the teacher to meet the requirements of the profession and face the challenges therein.

According to Goods Dictionary of Education Teacher education means, —all the formal and non-formal activities and experiences that help to qualify a person to assume responsibilities of a member of the educational profession or to discharge his responsibilities more effectively.

Teacher education encompasses teaching skills, sound pedagogical theory and professional skills. Teacher Education = Teaching Skills + Pedagogical theory + Professional skills.

An amalgamation of teaching skills, pedagogical theory and professional skills would serve to create the right knowledge, attitude and skills in teachers, thus promoting holistic development.

### **Nature of Teacher Education**

1. Teacher education is a continuous Teacher education is a continuous process and its pre-service and in-service components are complimentary to each other. According to the International Encyclopedia of Teaching and Teacher education (1987), —Teacher education can be considered in three phases: Pre-service, Induction and In-service. The three phases are considered as parts of a continuous process.
2. Teacher education is based on the theory that —Teachers are made, not born in contrary to the



assumption, —Teachers are born, not made. Since teaching is considered an art and a science, the teacher has to acquire not only knowledge, but also skills that are called tricks of the trade.

3. Teacher education is broad and comprehensive. Besides pre service and in-service programmes for teachers, it is meant to be involved in various community programmes and extension activities, viz adult education and non-formal education programmes, literacy and development activities of the society.
4. It is ever-evolving and dynamic. In order to prepare teachers who are competent to face the challenges of the dynamic society, Teacher education has to keep abreast of recent developments and trends.
5. The crux of the entire process of teacher education lies in its curriculum, design, structure, organization and transaction modes, as well as the extent of its appropriateness.
6. As in other professional education programmes the teacher education curriculum has a Knowledge base which is sensitive to the needs of field applications and comprises meaningful, conceptual blending of theoretical understanding available in several cognate disciplines; However the knowledge base in teacher education does not comprise only an admixture of concepts and principles from other disciplines, but a distinct gestalt' emerging from the conceptual blending', making it sufficiently specified.
7. Teacher education has become differentiated into stage-specific programmes.  
This Suggests that the knowledge base is adequately specialized and diversified across the stages which should be utilized for developing effective processes of preparing entrant teachers for the functions which a teacher is expected to perform at each stage.
8. It is a system that involves an interdependence of its Inputs,

### **The History of Teacher Education – An overview**

The history of education in ancient India is fascinating and is recorded and can be tracked to the ancient era. It began around 3<sup>rd</sup> century BC with elements of religious training and impart of traditional knowledge. Sages and scholars impart education orally. After that came gurukul system. In Vedic India the educator enjoyed a unique status and position. He was held in high esteem by the society not only because of his learning and scholarship but also due to qualities of head, heart and hand. The Guru or the teacher was an embodiment of good qualities, a fountain of knowledge and an abode of spirituality. The selection and preparation of a teacher was done with much rigour.

Teaching in the Upanishadic period was known for the personal attention paid to the student.



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Important feature of Buddhism required that every novice on his admission should place himself under the supervision and guidance of a preceptor (Upajjhaya). The disciple would 'choose an upajjhaya with much care and showed him the utmost respect. The upajjhaya, on his part, had much responsibility to the novice, the Saddhiviharika. He was to offer spiritual help and promote learning. The upajjhaya, on his part, had much responsibility to the novice, the Saddhiviharika. In the medieval period of 'Koran' Education is urged as a duty and in Muslim countries, education was held in high esteem. Though it was not widespread amongst the people teachers and instructors were given great respect. The Mohammedan rulers in India founded schools (Maktabs), Colleges (Madrassahs) and libraries in their dominions. In the maktab, often attached to a mosque, the students received instruction in the Koran which they had to recite, and reading, writing and simple arithmetic was also taught. The medium of "instruction was Persian but the study of Arabic was compulsory, In madrassahs the course included grammar, rhetoric, logic, theology, metaphysics, literature, jurisprudence and sciences. The method of teacher preparation was mostly initiation of what the old teachers practiced. Good and experienced teachers with a discerning eye identified able students and appointed them tutors to look after and teach the junior students in their absence. Thus the monitorial system was in vogue during the medieval times too and was the method of preparing the future teachers. The teachers were held in high esteem and were respected by the society and their students. In the modern period before the arrival of the Bruisers in India the European Missionaries first started scholars and later initiated teacher training institutions. The Danish Missionaries established a normal school for the training of teachers at Serampur near Calcutta. In Madras Dr. Andrew Bell started the experiment of Monitorial System which formed the basis of teacher training programme for the time being. It was used in England and known as Bell-Lancaster system. Mr. Campbell, Collector of Bellary, in his Minute dated 17th August 1823, commended this system by which the more advanced scholars are asked to teach the less advanced and this was well received in England. Then came Woods dispatch document for the promotion of English education in India in 19 July 1854. It was very crucial document. It suggested that allowances be given to persons who possess and aptness for teaching and who are willing to devote themselves to the profession of school master. Although apprehensive, Lord Dalhousie, Governor-General of India suggested implementation of Wood's Dispatch which brought into existence a number of normal schools. Then came Lord Stanley's Dispatch, 1859 after that The Indian Education Commission 1882 came gradually then many other updates were came and suggested many of the suggestions for teacher training. Finally came Government of India Resolution on Education Policy, 1904. This was one of the most significant educational documents which laid down the policies for the future educational system. It made some very



vital suggestions for the improvement of the teacher-training Programme. These were Training Colleges and Training Schools.

Thus, it can be observed that the recommendations and suggestions of the Resolution were of far reaching importance. Some of the suggestions of the Resolution were not implemented and several recommendations were implemented, some changes took place in the field of teacher training. Universities instituted B.T. degree for-graduate teachers. Rethinking on the syllabus improvements in facilities etc. were the outcomes of the Resolution. After that came The Government of India Resolution on Education Policy, 1913, Calcutta University Commission, 1917, The Hartog Committee, 1929, The Abbott-Wood Report, The Sergeant Report, 1944, it suggested a two-year course for pre-primary and junior Basic schools (after high school) and a three year course for the senior basic schools. The non-graduate teachers in high schools were to go for two year training and the graduates for one-year training. The first year of the two years training should be devoted to the study of the general and professional subjects. It should be supported by school visits, discussions and other experiences to kindle the trainee's interest in education. It proposed revised pay scales for all categories of teachers, to attract better teachers.

### **The Changing context of teacher education in the Indian scenario**

The well-established tradition of teaching and learning in India has retained its inherent strength even under adverse circumstances. The post-independence period was characterized by major efforts being made to nurture and transform teacher education. The system of teacher preparation has come under considerable pressure as a result of the expansion and growth of school education, through efforts to universalize elementary education. Having inherited a foreign model of teacher preparation at the time of independence from Britain in 1946, major efforts have been made to adapt and up-date the teacher education curriculum to local needs, to make it more context based, responsive and dynamic with regard to best meeting the particular needs of India. The current system of teacher education is supported by a network of national, provincial 12 and district level resource institutions working together to enhance the quality and effectiveness of teacher preparation programs at the pre-service level and also through in-service programs for serving teachers throughout the country.

#### **Post independence Teacher Education**

As reported by the MHRD, Government of India (Annual Report, 1999- 2000, p. 8) "One of the major achievements of NCTE during the short period of its existence has been the publication of monographs, reports and self learning modules for teacher educators and teachers during 1998-99. The publications brought out by NCTE provided a comprehensive outlook on several important aspects of teacher education".



To be specific, NCTE has brought out 66 publications and 6 CD ROMs by 2000-2001. Besides, many seminars, conferences and workshops are being organized by NCTE in different parts of the country for improving the teachers' competency, up gradation of syllabi and development of materials on teacher education. . Besides academic activities, the NCTE has achieved some success in its regulatory functions by bringing a vast majority of teacher training institutions under its purview. Particularly, commercialization of Teacher Education has been controlled to a great extent at the cost of a large number of cases pending in the courts and a huge expenditure on account of this. A so called landmark decision taken by NCTE was "to make Information and Communication Technology (ICT) literacy a compulsory part of B.Ed. course, mainly to create general awareness amongst the teacher trainees about ICT and its use in teaching-learning." (NCTE Annual Report, 2000-2001 p.3). Unless qualified and competent teachers/teacher educators are in a position to utilize properly the hardware facilities supplied by various agencies, the purpose for doing the same may not be realized. A landmark achievement was the establishment of the National Assessment and Accreditation Council (NAAC) by the UGC for quality assurance and enhancement of higher education. The development of teacher education has been traced in the post independent period. Important suggestions and recommendations have been made from the time of independence. From the University Education Commission (1948) to the decade of the 2000 importance has been given to teacher education, its development and enhancement. The establishments of UGC, NCERT, NCTE and NAAC have had substantial impact on teacher education. This is the scenario of past but there are recent changes in the field of teaching as well as teacher education programmes. Ever since the draft Education Policy has been introduced, the Union HRD ministry has been working over improving the education system in the country. On June 24, 2019 during a Lok Sabha session, Union HRD minister, Dr Ramesh Pokhriyal 'Nishank', introduced a number of reforms to improve teaching sector in the country.

Here's a look at the detailed pointers given by him on how education sector has improved so far:

- Subject wise learning. ...
- National Achievement Survey (NAS) ...
- Minimum qualification of teachers. ...
- BEd degree structure. ...
- Quality education. ...
- Equality in education. ...
- International exposure. ...
- Cultural festivals.



## 1. Subject wise learning

In order to highlight on quality education, the Central rules to the Right of Children to Free and Compulsory Education (RTE) Act, 2009 have been amended to include reference on class-wise, subject-wise learning outcomes. The learning outcomes for each class in languages (Hindi, English and Urdu), mathematics, environmental studies, science and social science up to the elementary stage have, accordingly, been finalized and shared with all states and UTs. These would serve as a guideline for state and UTs to ensure that all children acquire appropriate learning level.

## 2. National Achievement Survey (NAS)

The National Council of Educational Research and Training (NCERT) conduct periodic national surveys of learning achievement of children in classes 3, 5, 8 and 10.

Four rounds of National Achievement Survey (NAS) have been conducted so far for class 5 and three rounds for classes 3 and 8. These reveal improvement in learning achievement levels of pupils, in identified subjects from first round to fourth round.

Further, a National Achievement Survey based on learning outcomes was conducted for classes 3, 5 and 8 on November 13, 2017 with a sample frame upto district level to enable states/UTs to identify gaps in learning outcomes at district level and design strategies to address those gaps. Similarly, NAS for Class 10 was conducted on February 5, 2018. NAS Reports show students' learning levels against the expected learning outcomes of a particular grade and are used to provide feedback to the districts for further improvement.

## 3. Minimum qualification of Teachers

Section 23(2) of the RTE Act has been amended to extend the period of in-service training for untrained elementary teachers to March 31, 2019 in all the states and UTs.

As per the above amendment, all untrained in-service teachers working in government, government- aided, and private un-aided schools should acquire minimum qualification as laid down by an academic authority, authorized by the Central Government, by March 31, 2019.

The National Institute of Open Schooling (NIOS) was entrusted to conduct this training through ODL (Open Distance Learning) mode. The online D.El.Ed. Course has been started from October 3, 2017 and completed on March 31, 2019

## 4. B.Ed Degree Structure

A four year BEd integrated course to bring about qualitative improvement in teacher education programmes





in India has been conceptualized and regulations for this course have been published in official gazette on March 29, 2019 and applications have been invited w.e.f. June 31, 2019.

The model curriculum prepared for this course includes crucial aspects like gender, inclusive education, ICT, yoga, Global Citizenship Education (GCED) and Health & Sanitation. The teaching specialization would primarily be for the primary levels and the secondary level.

## 5. Quality education

The Right of Children to Free and Compulsory Education (Amendment) Act, 2018 has been notified on January 11, 2019. The said Act provides to empower the appropriate government to take a decision as to whether to hold back a child in class 5 or in class 8 or in both the classes, or not to hold back a child in any class till the completion of elementary education. The Act seeks to improve the learning levels of children and will lead to greater accountability and improvement in the quality of education.

## 6. Equality in Education

The Central Government has launched an integrated scheme for school education named as SamagraShiksha, w.e.f. 2018-19 which subsumes the three erstwhile Centrally Sponsored schemes of school education i.e. SarvaShiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), and Centrally Sponsored Scheme on Teacher Education (CSSTE).

The common objectives of all these schemes were to enhance access, to promote equity through the inclusion of disadvantaged groups and weaker sections and to improve the quality of education. The new integrated scheme envisages school education as a continuum from pre-school to senior secondary level and aims to ensure inclusive and equitable quality education at all levels.

## 7. International exposure

Government of India has decided to participate in the programme for International Students Assessment (PISA) to be conducted by the Organization for Economic Cooperation and Development (OECD) in 2021. PISA is a competency based assessment which unlike content based assessment, measures the extent to which students have acquired key competencies that are essential for full participation in modern societies. Learning from participation in PISA help to introduce competency based examination reforms in the school system and help move away from rote learning. The Central Board of Secondary Education (CBSE) and NCERT are a part of the process and activities leading to the actual test.

## 8. Cultural festivals

In order to experience and celebrate the rich cultural diversity of India, Rangotsav was held from December 7 to 21, 2018 in schools, with participation of students, teachers and other stake holders. Rangotsav is



focused on creating a non-judgmental platform for the participants to explore and express their artistic minds through dance, music, theatre, painting craft making etc.

The fortnight-long event promoted a joyful learning environment with no restriction on expression of different forms of arts. It is a gate way for each state to get exposed to the cultures, arts and languages of other States and UTs and enrich the minds of students and enhance their thrust for knowledge.

## 9. Grading system

In order to objectively evaluate the performance of the school education system in the states/UTs, MHRD has designed a 70 indicators based matrix called Performance Grading Index (PGI) to grade the states and UTs. The indicators have been chosen after detailed stakeholder consultation and the information on these indicators is drawn from the inputs provided by the respective states and UTs. This grading system will assist the states and UTs to identify the gap and design appropriate interventions to bridge them.

## 10. Integrated data

Timely and accurate data is the basis of sound and effective planning and decision making. Towards this end, the establishment of a well-functioning and sustainable Educational Management Information System is of utmost importance today. In 2018-19, the UDISE+ (i.e. UDISE plus) application has been launched to collect data from all schools, so that it becomes an effective tool for decision making.

## 11. E-learning material for teachers and students

In order to provide supplementary learning material for students and for upgrading the skills of teachers, MHRD has developed a dedicated Digital Infrastructure for Knowledge Sharing (DIKSHA) platform. The high quality e-learning material both for students and teachers are uploaded by ministry and states/UTs on this portal. This is expected to substantially augment the knowledge base of the students and technical skills of teachers at no additional cost.

## 12. Innovations in classroom study

The Government has launched Rashtriya Aavishkar Abhiyan (RAA) programme on 09.07.2015, to motivate and engage children of the age group of 6-18 years in science, mathematics and technology through observation, experimentation, inference drawing, model building, etc. both through inside and outside classroom activities.

The Central Government also supports states and UTs on early grade reading, writing and comprehension, and early mathematics programmes through a sub-programme namely 'Padhe Bharat Badhe Bharat' (PBBB) in foundational years of schooling.



### 13. Interactive content for students

A single point repository of e resources called e- PATHSHALA containing NCERT textbooks and various other learning resources has been developed for showcasing and disseminating all educational resources including textbooks, audio, video, periodicals, and a variety of other print and non-print materials.

### 14. Massive Open Online Courses (MOOCs)

MHRD has launched a Massive Open Online Courses (MOOCs) platform popularly known as SWAYAM (Study Webs of Active learning for Young Aspiring Minds) on July 9, 2017. The portal is offering various online courses for school education and higher education. NCERT is developing course modules for Massive Open and Online Course (MOOCs) for school education system in 12 subject areas (accountancy, business studies, biology, chemistry, economic, history, geography, mathematics, physics, political science, psychology and sociology) for classes 9-12. Twelve and twenty one courses have been completed in the first cycle and second cycle until November 30, 2018 on SWAYAM platform (<https://swayam.gov.in/>) respectively. Nearly 22,000 students and 30,000 students were registered in the first cycle and second cycle respectively.

### 15. Education channels

A programme for utilization of satellite communication technologies for transmission of educational e-contents through 32 National Channels i.e. SWAYAM PRABHA DTH-TV has been launched. Central Institute of Educational Technology (CIET)-NCERT is the national coordinator for one DTH TV channel i.e., Kishore Manch (#31) and has started feeding a 24x7 educational TV channel by July 9, 2018. Besides, NIOS is running five channels for teachers, for secondary and senior secondary levels and for sign language.

### Impact of National Policies

India has made considerable progress in school education since independence with reference to overall literacy, infrastructure and universal access and enrolment in schools. Two major developments in the recent years form the background to the present reform in teacher education.

The political recognition of Universalization of Elementary Education that led to the Right to Education Bill, 2008 and The National Curriculum Framework for school education, 2005

The Bill has been passed by the Parliament and the Right to Education Act has come into being making it mandatory for the state to provide free and compulsory education to almost 20 crore children in the 6-14 age group till class 8. The Act mandates a schedule for the functioning of schools which includes a teacher student ratio of 1:30 till a student population of 200 students at the primary stage. This would increase the demand for qualified elementary school teachers many times. The country has to address the need of



supplying well qualified and professionally trained teachers in large numbers in the coming years. The launch of the massive Sarva Shiksha Abhiyan in 2002 and the recent financial commitment and education cess to augment the Universal Elementary Education mission have underscored the need to adequately prepare teachers to address the growing demand for quality education.

### **Changing Role of the Teacher**

The present arrangement of schooling poses tremendous burden on children. Educationists are of the view that the burden arises from treating knowledge as a given, an external reality existing outside the learner and embedded in textbooks. Knowledge is essentially a human construct, a continuously evolving process of reflective learning. The NCF 2005, requires a teacher to be a facilitator of children's learning in a manner that the child is helped to construct his/her knowledge. Education is not a mechanical activity of information transmission and teachers are not information dispensers. Teachers have to increasingly play the role of crucial mediating agents through whom curriculum is transacted.

### **Conclusion**

Thus it is cleared that the year 2018 saw major reforms and initiatives in the education sector. Union Human Resources Development Minister has come up with landmark decisions to ensure quality, equity, accessibility, accountability and affordability in the education system, the government gave a tremendous push to research and innovation in the education sector. The whole effort is to improve the quality of higher education and to attract and retain the best talent in the country. All the incentives of earlier regulations have been maintained, but the API for college teachers has been removed," as said by HRD minister. All the above mentioned initiatives have major role in the teacher training courses as well as teacher education programme.



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### Reference

Martin, R.J. (1994) Multicultural Social Reconstructionist Education: Design for diversity in teacher education. *Teacher Education Quarterly* 21(3)77-89, EJ 492(4).

Mohanty, J. (2003) *Teacher Education* New Delhi, Deep and Deep Publications Pvt. Ltd

O'Loughlin, M. (1995) Daring the imagination, unlocking voices of dissent and possibility in teaching. *Theory into Practice* 24(2)170-116, EJ 512860

Sharma, Shashi. Prabha (2004) *Teacher Education in India*. Vikas Publications New Delhi.

Singh, L.C. (1990) *Teacher Education in India: A Resource Book*, Delhi, NCERT.

Singh, L.C. (1990) *Teacher Education in India: A Resource Book*, Delhi, NCERT.

[http://archive.mu.ac.in/myweb\\_test/ma%20edu/Teacher%20Education%20-%20IV.pdf](http://archive.mu.ac.in/myweb_test/ma%20edu/Teacher%20Education%20-%20IV.pdf)

[https://shodhganga.inflibnet.ac.in/bitstream/10603/83326/8/08\\_chapter%201.pdf](https://shodhganga.inflibnet.ac.in/bitstream/10603/83326/8/08_chapter%201.pdf)