ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 3| March2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

ICT AND PROFESSIONAL DEVELOPMENT OF SCHOOL TEACHERS IN THE CONTEXT OF THE INDIAN EDUCATION SYSTEM

PramitaRoy[1], Dr. Ujjwal Paul[2]

[1]*Assistant Professor, Bishnupriya College of Education, Nadibhag, Madhyamgram, North 24 Parganas, W.B., India,*
[2]*Assistant Professor (West Bengal Education Service), Government College of Education, Banipur, North 24 Parganas, W.B., India,*

Article DOI: https://doi.org/10.36713/epra26658
DOI No: 10.36713/epra26658

ABSTRACT

The Indian education system has significantly transformed from ancient to modern times. Rooted in traditional systems such as the 'Gurukul' education system, it has emerged into a structured, formal and policy-oriented framework. Information and Communication technology (ICT) has transformed the world's educational landscape, influencing teaching practices and professional development of teachers. In the Indian education system, the integration of ICT has become increasingly important, especially with the expansion of digital learning initiatives and the impact of the COVID-19 epidemic. ICT provides teachers with access to digital resources, online professional development programmes, collaborative learning networks and innovative teaching tools. However, the disparity in ICT competence between teachers creates a professional division between technical and limited digital teachers. The paper examines the role of ICT in the professional development of school teachers in India, explores policy initiatives aimed at supporting the integration of ICT, analyses the gap between ICT-skilled and unskilled teachers, and compares the Indian context with practices in developed countries. The study also investigates whether the expertise in ICT leads to tangible incentives or professional benefits for teachers within the Indian education system. This article also examines the structure of the Indian education system, its major challenges, and recent reforms such as the National Education Policy (NEP) 2020. The paper also highlights issues related to access, equity, quality, and employability, providing a comprehensive understanding of the system's current state and future directions. This article explores the concepts of pre-service and in-service training programme in teacher education, their objectives, and their significance in promoting effective ICT-based teaching. It also highlights challenges and suggests strategies for improving teacher readiness in the digital age.

KEYWORDS: *Teacher Education, Indian Education System, ICT, Pre-service & In-service Training, Digital Pedagogy, NEP 2020, Educational Reforms, School Education, Quality Education.*

INTRODUCTION

Education is vital for the socio-economic growth of a nation. India, known for possessing one of the largest education systems in the world, serves millions of learners from a wide range of socio-cultural backgrounds. The system is overseen by national policies and regulatory authorities that seek to ensure accessibility, inclusivity, and quality education. Nevertheless, in spite of considerable progress, the system continues to grapple with various structural and functional issues.

The Indian education system has its roots in ancient traditions such as the 'Gurukul' education system, where education was imparted through close teacher-student relationships. During colonial rule, the system was reshaped by British policies, particularly Macaulay's Minute on Education, which emphasised English education and modern curricula. Post-independence, India focused on expanding access to education and reducing illiteracy.

Structure of the Indian Education System

The present education system in India follows a structured pattern: like School Education—Pre-primary (Education: Early childhood care and education)— Primary Education: Grades 1-5—Upper Primary Education: Grades 6-8—Secondary Education: Grades 9-10—Higher Secondary Education: Grades 11-12—Higher Education: undergraduate, postgraduate, and doctoral programmes offered by universities and colleges. Teacher Education under Higher education includes undergraduate, postgraduate, Teacher Education programmes and doctoral programmes offered by universities and colleges. Regulatory bodies such as the University Grants Commission (UGC), NCTE (National Council for Teacher Education) control and regulate the quality of academic progression of Higher Education Institutions across India.

As rightly stated in Kothari Commission report (1964-66), "The destiny of India is now being shaped in her classrooms." Consequently, Information and Communication technology (ICT) has become an important element of teacher professional development, enabling educators to modernise their competences and adapt to digital education requirements continually. The rapid developments of Information and Communications Technologies (ICTs) have significantly transformed the global education sector. ICT refers to digital technologies used for access, processing, storage, and dissemination of information, such as computers, the Internet, mobile devices, multimedia tools, and communication networks. In modern educational systems, teachers should not

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 3| March2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

only possess subject knowledge and teaching skills, but also integrate technology effectively into the teaching and learning process.

Major Challenges in the Indian Education System

1. Inequality and Access

Disparities exist in educational access influenced by socio-economic status, gender, and geographical location

2. Quality of Education

The quality of teaching and learning outcomes varies considerably across institutions. Teacher training and infrastructure remain areas of apprehension.

3. Rote Learning

The system has historically prioritized memorization rather than critical thinking and creativity, which restricts comprehensive development and holistic expansion.

4. Employability Issues

There is a disparity between academic curricula and industry requirements, leading to high levels of graduate unemployment.

5. Infrastructure Constraints

Numerous educational institutions are deficient in fundamental amenities, including adequate classrooms, sanitation facilities, and digital resources.

Recent Reforms and Developments

A major reform initiative is the National Education Policy 2020, which aims to overhaul the education system. Key features include:

Introduction of a 5+3+3+4 structure, emphasis on multidisciplinary learning, focus on early childhood education, promotion of digital learning and technology integration, encouragement of skill development and enhancement of vocational education.

Role of Technology in Education

In India, the importance of ICT in education has increased considerably in the past decade. Government initiatives such as the Digital India campaign, DIKSHA platform ((Digital Infrastructure for Knowledge Sharing), and SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds) online courses have promoted the use of digital technologies in teacher education and professional training. Furthermore, the National Education Policy (NEP) 2020 emphasizes the integration of technology in teacher training and continuous professional development.

However, despite these initiatives, disparities remain in teachers' access to technology, digital literacy, and institutional support. These disparities often create differences in professional opportunities and teaching effectiveness between teachers who possess ICT skills and those who do not. Digital platforms and online learning have gained prominence, especially after the COVID-19 pandemic. Initiatives like SWAYAM and DIKSHA have enhanced access to educational resources, though the digital divide remains a concern.

ICT in Education: An Overview

Information and Communication Technology (ICT) includes digital tools such as computers, the internet, smart boards, and educational software used to facilitate teaching and learning. ICT enhances access to information, supports interactive learning, and promotes collaborative education.

Research on ICT integration in teacher education highlights its potential to improve pedagogical competencies and professional growth.

Darling-Hammond et al. (2017) emphasize that continuous professional development is essential for improving teacher effectiveness and adapting to evolving educational contexts.

Several studies conducted in the Indian context also highlight the impact of ICT on teacher development.

Ali (2019) stated that the demand on teachers to integrate ICT into their pedagogy is high and places additional pressures on teachers in an already challenging profession. Initially, teachers have to increase their own ICT skills and then they have to change elements of their practice to utilise ICT with their students. There is a premise that ICT competent teachers will produce ICT competent students.

Similarly, a study conducted in Raipur showed that ICT training programs significantly improved teachers' pedagogical abilities and attitudes towards the integration of technology into classrooms. These studies show that ICT integration plays an important role in improving the professional identity, effectiveness, and career development of teachers.

Concept of Professional Development of Teachers

Professional development refers to the continuous process through which teachers improve their knowledge, skills, pedagogical practices, and professional competencies throughout their careers.

According to Desimone (2009), effective professional development is characterized by sustained learning, collaborative participation, and direct relevance to classroom practice. It involves activities such as workshops and training programs, professional learning communities, peer collaboration and mentoring, research and reflective practice, online training and certification courses.

Concept of Pre-service and In-service Programmes in Teacher Education and Their Importance in ICT-Based Teaching

Pre-service teacher education refers to the formal training provided to prospective teachers before they enter the teaching profession. It includes programs such as Diploma in Education (D.El.Ed.) and Bachelor of Education (B.Ed.), which focus on pedagogical theories, subject knowledge, and teaching skills. Pre-service training ensures that teachers enter the profession with a basic understanding of digital literacy and instructional technologies (UNESCO, 2018).

Aim and objectives of these programmes include

Developing foundational teaching competencies, familiarizing teachers with educational psychology and pedagogy, and introducing the use of ICT tools in teaching-learning processes.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 3| March2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

It also focuses on enhancing teaching effectiveness, updating knowledge about new technologies and promoting lifelong learning among teachers.

In-service teacher education refers to continuous professional development programmes designed for practicing teachers. These programmes help teachers update their knowledge, skills, and teaching methodologies. In-service programmes are particularly important in the context of ICT, as technology evolves rapidly and requires continuous up skilling (Darling-Hammond et al., 2017).

Importance of Pre-service and In-service Programmes in ICT-Based Teaching

1. Development of Digital Competence

Both pre-service and in-service programs provide educators with the crucial digital competencies necessary for teaching that incorporates information and communication technology (ICT). Educators acquire the ability to utilize digital instruments, online materials, and multimedia resources efficiently (UNESCO, 2018).

2. Enhancement of Pedagogical Practices

ICT enables innovative teaching methods such as blended learning, flipped classrooms, and interactive simulations. Teacher education programmes help educators adopt these methods efficiently.

3. Promoting Student Engagement

Information and Communication Technology (ICT) tools enhance the interactivity and engagement of the learning process.Educators who are proficient in ICT are capable of developing dynamic educational settings that accommodate various learning preferences.

4. Facilitating Inclusive Education

ICT promotes inclusive education by offering assistive technologies tailored for learners with disabilities. Training programs for teachers equip educators with the skills necessary to utilize these tools effectively.

5. Continuous Professional Development

In-service programmes ensure that teachers remain updated with emerging technologies and pedagogical trends, fostering lifelong learning (Darling-Hammond et al., 2017).

The incorporation of Information, Communication, and Technology (ICT) in education pertains to the utilization of computer-based communication that structures the daily instructional activities in the classroom. In alignment with equipping students for the contemporary digital era, educators are regarded as pivotal figures in the application of ICT within their everyday teaching environments. (Mukherjee & Sahoo, 2021)

ICT has significantly enhanced the scope and accessibility of professional development opportunities by providing digital platforms for training and collaboration. ICT-based professional development allows teachers to participate in online courses, webinars, and virtual conferences without geographical limitations. It also enables educators to access digital teaching resources, research publications, and global knowledge networks.

Selvam (2025) argues that ICT offers flexible and effective approaches to teacher training and connects educators to broader professional communities, thereby improving both teaching practices and learning outcomes.

The evolution of technology has significantly altered the educational environment, rendering ICT a vital element of both teaching and learning processes. Educators are now anticipated to incorporate digital tools into their pedagogical methods to improve student engagement and educational outcomes. Teacher education plays a pivotal role in preparing educators to meet the demands of modern classrooms. With the rapid integration of Information and Communication Technology (ICT) in education, both pre-service and in-service teacher education programmes have become essential for equipping teachers with digital competencies. Consequently, teacher education programs—encompassing both pre-service and in-service training—are essential for cultivating ICT skills among teachers (Koehler & Mishra, 2009). Pre-service teacher education pertains to the formal instruction given to future educators prior to their entry into the teaching field. The NCTE prescribes programs such as the Diploma in Education (D.El.Ed.) and Bachelor of Education (B.Ed.), which emphasize pedagogical theories, subject matter expertise, and instructional abilities. Both pre-service and in-service programs prepare teachers with the necessary digital competencies for ICT-integrated teaching. Educators acquire the ability to utilize digital tools, online materials, and multimedia resources effectively (UNESCO, 2018).

Role of ICT in Professional Development of School Teachers

Access to Digital Learning Resources

ICT offers teachers access to a broad spectrum of educational resources, including digital textbooks, research journals, online training courses, and multimedia teaching tools. Platforms like DIKSHA allow teachers to engage with structured professional development modules that align with national and state curricula. These resources assist teachers in updating their subject knowledge and implementing innovative teaching methods.

Enhancement of Pedagogical Practices

ICT enables teachers to use modern pedagogical approaches such as: Blended learning, Flipped classrooms, Multimedia-based teaching, and Online assessments. These methods encourage student-centred learning and improve classroom engagement.

Research indicates that ICT training significantly enhances teachers' pedagogical competencies and fosters positive attitudes toward technology integration in education.

Collaboration and Professional Learning Communities

ICT promotes collaboration among teachers via digital platforms like online forums, webinars, and social media groups. Educators can exchange lesson plans, teaching resources, and personal experiences with colleagues from various regions. Additionally, digital communication tools allow teachers to engage in global professional learning networks and collaborative research projects.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 3| March2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

ICT in Indian Educational Policies

National Education Policy (NEP) 2020

The NEP 2020 underscores the significance of integrating technology into education and highlights the role of ICT in teacher development. It advocates for creating the National Educational Technology Forum (NETF) to foster idea sharing, best practice exchange, and research in educational technology. Additionally, the policy promotes utilizing digital platforms for ongoing professional development (CPD) and certification initiatives.

Government Initiatives Supporting ICT

Several government initiatives aim to enhance ICT integration in teacher education:

1. DIKSHA Platform – Provides digital teaching resources and professional training modules.
2. SWAYAM – Offers Massive Open Online Courses (MOOCs) for teachers and students.
3. National Mission on Education through ICT (NMEICT) – Promotes digital infrastructure and online learning resources.
4. ICT in Schools Scheme – Introduces digital infrastructure and training programs in schools.

These initiatives reflect the government's commitment to digital transformation in education.

DISCUSSION

Professional Divide between ICT-Skilled and Non-ICT-Skilled Teachers

The increasing integration of ICT in education has led to a noticeable divide between teachers who possess strong digital competencies and those who do not.

Teachers with ICT skills tend to participate more actively in online professional development programs, access digital teaching resources, use innovative pedagogical strategies, and engage in collaborative professional networks. In contrast, teachers with limited ICT skills often face difficulties in accessing these opportunities, which may slow their professional growth.

The digital divide is particularly visible in rural areas where teachers may lack adequate infrastructure, internet connectivity, or training opportunities.

ICT Skills and Professional Recognition

Another important question concerns whether ICT-skilled teachers receive tangible professional benefits. The following questions arise in these contexts.

- Do educational institutions offer financial rewards, promotions, or acknowledgment for the integration of ICT in their teaching practices?
- How do teachers proficient in ICT view the support provided by their institutions for enhancing their digital skills?
- Does the absence of incentives result in diminished motivation to innovate within the realm of digital pedagogy?
- Are the responsibilities related to ICT disproportionately allocated among educators in schools?

In many Indian schools, teachers who demonstrate technological competence are often assigned additional responsibilities such as- managing digital classrooms, conducting online classes, training other teachers, managing school digital infrastructure. However, these additional responsibilities do not always translate into formal incentives such as salary increments, promotions, or reduced workload.

Thus, ICT proficiency often results in increased responsibilities rather than structured professional rewards. ICT-savvy teachers in India currently have few and mostly indirect incentives. Among the ways of acknowledgment are involvements in specialized training courses, possibilities to spearhead digital projects in educational institutions, invitations to conferences and workshops, acknowledgment at the district or institutional levels. However, most educational institutions still lack systematic incentive mechanisms like monetary compensation, career certification perks, or career advancement opportunities.

Comparison with Developed Countries

In many developed countries, ICT competency is integrated into teacher professional standards and career advancement frameworks. For example:

In **United States,** Professional development initiatives for educators typically feature technology certification, and those with digital proficiency might gain extra professional recognition or leadership opportunities. In Finland, educators undergo comprehensive training in digital pedagogy as part of their pre-service education, while schools offer ongoing technological support.

In **Singapore**, the integration of ICT is incorporated into organized teacher development programs, and educators are granted professional incentives for their innovative approaches to digital pedagogy. Compared to these countries, India is still in the early stages of institutionalizing incentives for ICT proficiency among teachers.

In **Germany**, the integration of ICT in education is directed by both national and state-level initiatives, including the Digital Pakt Schule (A federal funding initiative in Germany aimed at upgrading school infrastructure through investments in digital technologies). Educators undergo organized ICT training, and digital competence is progressively acknowledged as an essential professional skill. Nevertheless, akin to the situation in India, the incentives provided are frequently indirect. Teachers proficient in ICT may be offered: Leadership positions in digital initiatives, Involvement in sponsored training programs, Institutional acknowledgment. However, formal financial incentives are still scarce, despite robust infrastructure and systemic support (Eickelmann & Gerick, 2020).

The **United Kingdom** has achieved notable advancements in the incorporation of Information and Communication Technology (ICT) into the professional standards for teachers. The Teaching Standards framework highlights the importance of digital competence as a crucial element of effective teaching.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 3| March2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

Key aspects include: Compulsory ICT integration within teacher training, Availability of continuous professional development (CPD) programs, acknowledgment through career progression pathways. Teachers who exhibit strong ICT capabilities frequently receive: Promotions (for instance, as digital learning coordinators), leadership positions in Ed.Tech. Initiatives, opportunities to engage in curriculum innovation. Therefore, ICT competence is more explicitly associated with professional growth compared to India. OECD. (2019)

France has adopted national strategies such as Le numérique pour l'éducation, which emphasizes the digital transformation of schools. Educators receive: ICT training programs, access to digital teaching platforms, and institutional backing for digital pedagogy. Nevertheless, akin to India, formal incentives are still in development, and ICT skills frequently result in additional responsibilities rather than direct rewards.

Japan employs a highly organized approach to ICT integration in teacher development. Notable aspects include: government-led initiatives like the GIGA School Program, a focus on a one-device-per-student model, and compulsory ICT training for educators. Regarding professional development, teachers participate in continuous ICT training, and digital competence is anticipated as part of their professional obligations, with schools offering robust technological infrastructure. However, culturally, ICT skills are often perceived as a professional duty rather than a basis for additional incentives. Consequently, while recognition is present, explicit financial or promotional incentives remain limited. OECD. (2021)

Need for Inclusive ICT-Based Professional Development

To address the professional divide among teachers, and close the professional divide among teachers, education systems need to embrace inclusive ICT training strategies such as: Ongoing digital literacy programs Peer mentoring and collaborative training opportunities Institutional support for the integration of technology Acknowledgment and incentives for innovative teaching approaches These actions can ensure that ICT serves all teachers and promotes equitable professional development.

Challenges in ICT Integration in Teacher Education

Despite its benefits, various obstacles impede the integration of ICT in teacher professional development in India:

Digital Divide- There are considerable differences in ICT infrastructure between urban and rural schools, which also support the study of Kour and Mirza (2025).

Lack of Training- A significant number of teachers have not been sufficiently trained to utilize digital technologies effectively.

Infrastructure Constraints- Restricted access to computers, internet connectivity, and technical support continues to be a significant hindrance.

Resistance to Change- Certain teachers may be reluctant to embrace new technologies due to a lack of confidence or familiarity.

There are some specific challenges which are constraints to introduce proper ICT in Teacher Education programme like: Lack of infrastructure and digital resources, insufficient training and support, resistance to change among teachers, digital divide between urban and rural areas. These challenges hinder the effective implementation of ICT-based teaching despite the availability of training programmes.

Suggestions for Improvement

There are some specific management approaches which may be taken to furthermore enhance inculcation of proper ICT for school teachers for future development of the school going learners, such as:

1. Integrating ICT training comprehensively in pre-service curricula
2. Providing regular, hands-on in-service training workshops
3. Ensuring access to digital infrastructure in schools
4. Encouraging collaboration and peer learning among teachers
5. Supporting policy initiatives that promote ICT in education
6. Strengthening teacher training programs
7. Increasing public investment in education
8. Promoting research and innovation
9. Bridging the digital divide
10. Enhancing industry-academia collaboration

CONCLUSION

Information and Communication Technology (ICT) has become a significant asset for advancing the professional growth of educators in India. Digital tools allow teachers to obtain educational materials, engage with colleagues, and implement innovative teaching methods. Government programs like DIKSHA, SWAYAM and ICT in Schools Schemes have played a crucial role in the proliferation of ICT-oriented teacher training. Nevertheless, differences in ICT proficiency and accessibility have resulted in a professional gap among educators. While teachers with ICT skills enjoy enhanced career prospects, there is a scarcity of structured incentives for technological expertise within the Indian educational framework. To fully harness the capabilities of ICT in teacher development, it is essential for policymakers to prioritize the enhancement of digital infrastructure, offer inclusive training initiatives, and create well-defined incentive systems for teachers proficient in ICT.

Pre-service and In-service teacher education programs are vital for equipping teachers to successfully incorporate ICT into their instructional methods. While pre-service education establishes the groundwork, in-service training facilitates ongoing professional development. Collectively, they are instrumental in improving the quality of education in the digital age. To optimize their effectiveness, systematic initiatives must be undertaken to tackle current challenges and encourage successful ICT integration. From this viewpoint, it is important to highlight the research carried out by Malik & Shafeeq (2016), which indicates that Pre-service Training will assist novice teachers in gaining proficiency in utilizing educational resources through technology. Furthermore, it will inform In-service teachers about new technologies that can aid them in their professional development, which also corresponds with the fundamental principles of our study.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 3| March2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

The Indian education system currently stands at a pivotal point, where it must reconcile traditional values with contemporary requirements. Although initiatives such as NEP 2020 present a hopeful framework, the successful execution of these reforms is essential for realizing equitable and high-quality education for everyone. Ongoing assessment and adjustment are crucial to align with both global benchmarks and national aspirations. These actions will contribute to the formation of a more technologically adept teaching workforce, equipped to address the challenges of twenty-first-century education.

REFERENCES

1. *Abbasi, S., Abbasi, P., Alvi, H., Junejo, S., & Shaharbano. (2025). The Impact of ICT on Teacher Professional Development: A Quantitative Study. Indus Journal of Social Sciences, Volume 3, Number 1.Online ISSN: 2960-219X.*
2. *Ali, M.M. (2019). Professional Development of Teachers with ICT. Indian Journal of Educational Technology, Vol.1 (1). https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://journals.ncert.gov.in/IJET/article/download/256/53/516&ved=2ahUKEwj3q9r6irSTAxXjR2cHHVGTHl0QFnoECBcQAQ&usg=AOvVaw06iyzHUyL3Y4czWl_zfG9z*
3. *Choudhury, G. (2025). ICT responsive pedagogy for professional development of teachers. International Journal of Research and Innovation in Applied Science. https://doi.org/10.51584/IJRIAS.2025.100600128*
4. *Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. Learning Policy Institute. https://files.eric.ed.gov/fulltext/ED606743.pdf*
5. *Das, S., & Verma, S. (2025). Impact of ICT training on teachers' pedagogical competency and attitudinal shift. Shodhshauryam Research Journal. https://doi.org/10.32628/SHISRRJ258453*
6. *Department for Education. (2019). Realising the potential of technology in education: A strategy for education providers and the technology industry. UK Government. https://www.gov.uk/government/publications/realising-the-potential-of-technology-in-education*
7. *Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward Better Conceptualizations and Measures. Educational Researcher, 38(3), 181–199. https://doi.org/10.3102/0013189X08331140*
8. *Eickelmann, B., & Gerick, J. (2020). Learning with digital media: Objectives in times of social distancing. International Association for the Evaluation of Educational Achievement (IEA). DOI:10.1080/02619768.2020.1809650*
9. *Government of India. (2020). National Education Policy 2020. Ministry of Education. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf*
10. *Kingdon, G. G. (2007). The progress of school education in India. Oxford Review of Economic Policy, 23(2), 168–195. https://schoolchoice.in/blog/wp-content/uploads/2011/05/School_Progress_Mar_2007.pdf*
11. *Kumar, K. (2005). Political agenda of education: A study of colonialist and nationalist ideas. Sage Publications. https://arvindguptatoys.com/arvindgupta/pol-agenda-kk.pdf*
12. *Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning. Review of Educational Research, 77(4), 575–614. DOI:10.3102/0034654307309921*
13. *Malik, M., & Shafeeq, N.Y. (2016). ICT and professional development of teachers.IJAR 2016; 2(12): 452-455. ISSN Online: 2394-5869*
14. *Ministère de l'Éducation nationale. (2019). Digital strategy for education (Le numérique pour l'éducation). Government of France.*
15. *Ministry of Education, Culture, Sports, Science and Technology (MEXT). (2020). GIGA School Program. Government of Japan. https://www.mext.go.jp/en/content/20201207-mxt_kokusai-000011780_1.pdf*
16. *Ministry of Education. (1966). Report of the education commission 1964-66: Education and national development. Government of India. https://www.gscepublications.com/gk/d252ecba-5346-4d21-8a05-e8cdf2731e6e_GKMaterial.pdf*
17. *Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. Teachers College Record, 108(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x*
18. *Mohamed, I.M., Ali, A., & Rotich, S. (2024). Relationship between Teacher Professional Development and use for ICT in Teaching and Learning in Primary Schools in Sabuli Sub County, Wajir County. Asian Journal of Education and Social Studies, Volume 50, Issue 6, Page 122-132, 2024; Article no.AJESS.116771. ISSN: 2581-6268.*
19. *Mukherjee, T., & Sahoo, S. (2021). ROLE OF ICT IN 21ST CENTURY'S TEACHING PROFESSIONAL DEVELOPMENT. https://doi.org/10.37896/sr8.2/002*
20. *OECD. (2019). OECD reviews of digital transformation: Going digital in France. OECD Publishing. https://doi.org/10.1787/9789264311335-en*
21. *OECD. (2019). OECD skills outlook 2019: Thriving in a digital world. OECD Publishing. https://doi.org/10.1787/df80bc12-en*
22. *OECD. (2020). TALIS 2018 results (Volume I): Teachers and school leaders as lifelong learners. OECD Publishing. https://doi.org/10.1787/1d0bc92a-en*
23. *OECD. (2021). Teachers and school leaders as lifelong learners: OECD TALIS 2018 results (Volume II). OECD Publishing. https://doi.org/10.1787/1d0bc92a-en*
24. *Samantaray, A.K. (2017). Professional Development of Secondary School Teachers through ICT. IJRAR- International Journal of Research and Analytical Reviews. VOLUME 5 I ISSUE 1. E ISSN 2348 –1269.*
25. *Sarkar, S. (2018). Ict approach and its role in professional development for teacher's preparation programme. JETIR, Volume 5, Issue 7. ISSN-2349-5162.*
26. *Selvam, S. P. S. (2025). Importance of ICT pedagogy integration in teacher education. Educational Trend (NCERT Journal). NCERT Journals. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://ejournals.ncert.gov.in/index.php/ET/article/download/3605/3425&ved=2ahUKEwirx6KyhrSTAxULwjgGHZGsF8oQFnoECBYQAQ&usg=AOvVaw36j7Qa8JNBAVe2l_uq7BYQ*
27. *Shil, D., & Gupta, S. K. (2025). Role of ICT in the career advancement of B.Ed teachers in Rural West Bengal. Stallion Journal for Multidisciplinary Associated Research Studies. https://doi.org/10.55544/sjmars.4.3.16*
28. *Tilak, J. B. G. (2015). How inclusive is higher education in India? Social Change, 45(2), 185–223. https://doi.org/10.1177/0049085715574178*

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 3| March2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

29. *UNESCO. (2018). ICT competency framework for teachers. United Nations Educational, Scientific and Cultural Organization. https://teachertaskforce.org/sites/default/files/2020-07/ict_framework.pdf*
30. *University Grants Commission. (2018). Annual report. Government of India. https://www.ugc.gov.in/pdfnews/5595965_UGC-ANNUAL-REPORT-English-2017-18.pdf*