

Enhancing Teacher Training and Professional Development for 21st-Century Education

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Abstract

With the education system evolving under the National Education Policy (NEP) 2020 in the digital age, the role of a teacher as a facilitator of knowledge has become even more significant. The educational demands of the 21st century require that educators possess not only content knowledge but also a diverse blend of pedagogical and technological skills. Educators face the challenge of effectively integrating technology into their classroom practices. This paper explores the importance of enhancing teacher education and professional development by focusing on the multifaceted role of educators and the challenges they face in meeting the evolving needs of modern learners. By identifying key areas for improvement, the paper aims to provide insights into how teacher education can be reimagined and strengthened to empower educators, equipping them with the knowledge, skills, and competencies needed to address the complexities of contemporary education.

Keywords

Professional Development, Teacher Training, 21st Century Education, NEP 2020, Technology Integration.

Introduction

In the dynamic landscape of the 21st century, education stands as the cornerstone of societal progress and individual growth. With rapid advancements in technology, evolving societal needs, and shifting economic paradigms, the role of educators has become increasingly complex and multifaceted. In response to these transformations, it is necessary to enhance teacher education and professional development to ensure that educators are equipped with the requisite skills, knowledge, and pedagogical approaches to effectively navigate the challenges and opportunities of contemporary education. Educators are tasked not only with imparting knowledge but also with fostering the development of essential skills and competencies vital for success in the 21st century. They are empowered to effectively prepare students for the challenges and opportunities of the future, thereby laying the foundation for a more equitable, innovative, and prosperous society.

For years, pre-service teacher training in India has focused on preparing teachers to use innovative teaching aids appropriate to the content and based on one's imagination and creativity. The responsibility of teachers is no longer merely to present facts. Instead, a

teacher's job is to help children understand and constructively use available information. With the advent of new technologies, there has been a shift in the method of content transaction. Today's students come to the classroom with a wealth of information collected from various sources. This information can be utilized by the teacher to construct their knowledge, serve as a resource to promote thinking, and expand upon it, which can lead to innovative ideas among students (Padmavathi, 2017).

Teachers need to grasp that technology is not simply about adding computers to traditional teaching methods. Instead, it involves integrating the benefits of information and communication technology (ICT) in a manner suitable for the subject and topic being taught. Innovative teaching necessitates a deep understanding of pedagogical content knowledge (PCK), an awareness of how technology can be used to engage with and process subject matter, and the skill to blend both elements to revolutionize how content is delivered for improved learning outcomes.

Mishra and Koehler (2006) expanded on Shulman's model of teacher knowledge by adding a third major category: Technological Awareness. The resulting TPACK model includes the teacher's understanding of how to integrate technology into their teaching. This framework added "technical knowledge (TK)," "technological pedagogical knowledge (TPK)," and "technological content knowledge (TCK)" to Shulman's original theory. The TPACK framework recommends that effective teachers possess subject knowledge, appropriate teaching skills, and technological competencies to help their students achieve learning outcomes (Aslam et al., 2021, cited in Mishra et al., 2006).

Studies reveal that teachers often use technology to facilitate students' learning by asking them to complete homework or practice work on a computer. Unless teacher educators model the effective use of technology in their own classes, it will be impossible to prepare a new generation of teachers who can effectively use new tools for teaching and learning (Shah, 2019). To achieve the kind of technology use required for 21st-century teaching and learning (Ertmer & Ottenbreit-Leftwich, 2010, cited in Lai, 2008; Law, 2008; Thomas & Knezek, 2008), we need to help teachers understand how to use technology to facilitate meaningful learning, which enables students to construct deep and connected knowledge. While "technology can make it quicker or easier to teach the same things in routine ways," it also makes it possible to "adopt new and arguably better approaches to instruction and/or change the content or context of learning, instruction, and assessment" (Ertmer & Ottenbreit-Leftwich, 2010, cited in Lawless & Pellegrino, 2007, p. 581). These latter uses are precisely the ones that the majority of today's teachers find most challenging, perhaps because they require the most significant amount of change (Ertmer & Ottenbreit-Leftwich, 2010).

The Technological Pedagogical Content Knowledge (TPACK) framework provides a conceptual lens through which teacher training and professional development can be effectively designed and implemented. Simply knowing how to use a piece of hardware (e.g., a digital camera) or a specific software application (e.g., a presentation tool, a social networking site) is not enough to enable teachers to use technology effectively in the classroom (Ertmer & Ottenbreit-Leftwich, 2010). To use technology to support student-centered instruction, teachers need additional knowledge of the content they are required to teach, the pedagogical methods that facilitate student learning, and the specific ways in which technology can support students' learning (Ertmer & Ottenbreit-Leftwich, 2010).

The recent implementation of technology in the classroom is arguably one of the most challenging innovations that many teachers are confronting today. For teachers and schools that have access to new technology, especially computers, the challenge is to learn how to use it effectively. For those without access, the challenge is even greater.

Continuous Professional Development in National Education Policy (NEP) 2020

In the words of the Justice JS Verma Committee Report (2012), ‘a broken teacher education sector is putting our young children at risk’. Under NEP 2020, teachers will be given constant opportunities for self-improvement and to learn the latest innovations and advances in their profession. To ensure that every teacher has the flexibility to optimize their own development, a modular approach to continuous teacher development will be adopted. Developmental opportunities, in the form of local, state, national, and international teaching and subject workshops, as well as online teacher development modules, will be available to all teachers, allowing each to choose what is most useful for their own development. Platforms, especially online ones, will be developed so that teachers may share ideas and best practices. Each teacher will be expected to participate in approximately 50 hours of Continuous Professional Development (CPD) opportunities every year, driven by their own needs and choices. CPD opportunities will systematically cover the latest pedagogies, such as experiential learning, arts-integrated, sports-integrated, and storytelling-based approaches, as well as foundational literacy and numeracy, formative and adaptive assessment of learning outcomes, and individualized and competency-based learning (NEP, 2020).

Leaders, such as school principals and school complex leaders, will have similar modular leadership and management workshops and online development opportunities to continuously improve their skills and share best practices. These leaders will also be expected to participate in at least 50 hours of CPD modules per year, covering leadership, management, content, and pedagogy, with a focus on preparing and implementing pedagogical plans based on competency and outcome-based education (NEP, 2020). NEP 2020 underscores the importance of continuous teacher training and professional development to equip educators with the necessary competencies to adapt to changing educational landscapes. TPACK serves as a guiding framework for designing teacher training programs that focus on developing educators' technological, pedagogical, and content knowledge.

Significance of Teacher Training and Professional Development in the 21st Century

Technology has revolutionized the way we live, work, and learn. In today's classrooms, digital tools and resources play a pivotal role in enhancing teaching and learning experiences. However, harnessing the potential of technology requires teachers to be adept at integrating it seamlessly into their instructional practices. Teacher training programs provide educators with the skills and knowledge needed to leverage technology effectively, ensuring that students are equipped with the digital literacy skills essential for success in the 21st century.

Diversity is a hallmark of modern classrooms, with students hailing from various cultural, linguistic, and socioeconomic backgrounds. Effective teaching requires an understanding of diverse learning styles, abilities, and experiences. Teacher training and professional development initiatives equip educators with strategies for creating inclusive learning environments where every student feels valued, respected, and supported. By embracing diversity, teachers can foster a culture of equity and belonging, laying the foundation for student success.

The traditional lecture-based approach to teaching is no longer sufficient to prepare students for the challenges of modern times. Innovative teaching methods such as project-based learning, collaborative inquiry, and personalized instruction are gaining prominence as educators seek to engage students in meaningful and authentic learning experiences. Teacher training programs expose educators to these innovative pedagogical approaches, empowering them to reimagine their teaching practices and inspire student curiosity, creativity, and critical thinking.

The 21st century demands a shift from a focus on rote memorization and standardized testing to an emphasis on developing essential skills such as communication, collaboration, creativity, and critical thinking. Teacher training and professional development initiatives help educators understand and embrace these new educational paradigms, enabling them to design learning experiences that cultivate the skills and competencies students need to thrive in an increasingly complex and interconnected world.

Effective teaching is a dynamic and evolving process that requires continuous learning and growth. Professional development opportunities provide teachers with the chance to reflect on their practice, collaborate with colleagues, and stay abreast of emerging trends and best practices in education. By investing in their professional development, educators demonstrate a commitment to excellence and lifelong learning, ultimately enhancing their effectiveness in the classroom and improving student outcomes. By investing in the ongoing growth and development of educators, we can ensure that our schools are equipped to meet the needs of diverse learners, harness the power of technology, promote innovative teaching practices, and prepare students for success in an ever-changing world. As we navigate the complexities of modern education, let us recognize the invaluable role that teachers play and commit to providing them with the support and resources they need to thrive. Teacher professional development is necessary to improve the quality of education and to ensure that all teachers are able to meet the needs of a diverse student population.

Characteristics of Professional Teachers in the 21st Century

- **Embracing Technology Integration in Pedagogy:** In the digital age, technology has become an integral part of teaching and learning. Teacher training programs should equip educators with the skills and knowledge to effectively integrate technology into their pedagogy. This includes understanding how to use educational software, multimedia resources, and online platforms to enhance instruction, engage students, and personalize learning experiences. Teachers should also be trained in digital citizenship and online safety to navigate the complexities of the digital world responsibly.

- **Subject and Pedagogical Knowledge:** Subject knowledge, which is the content teachers are expected to impart, is crucial. Pedagogical knowledge refers to the specialized knowledge teachers use to create effective teaching and learning environments for all students. Teachers must have adequate and up-to-date subject and pedagogical knowledge to positively impact student learning outcomes through quality teaching.
- **Commitment to Continuous Learning:** Teachers should be committed to change and continuous learning. They are expected to be lifelong learners in order to deliver the new and required knowledge of the current time.
- **Using Social Media Appropriately:** Social media privacy is of utmost importance for a teacher to keep their work and personal life separate. Their personal views should not influence their students' views. Once a teacher posts something on their social media account, it is there to stay and may have repercussions later. It is advisable for teachers to have tailored privacy settings to control what appears on their social accounts and who can see it.
- **Privacy and Confidentiality:** It is the responsibility of the teacher to maintain the privacy and confidentiality of every student's data, whether related to academic or personal issues. No judgments should be passed on students based on their confidential details. Such information should only be shared with concerned individuals, such as parents or other teachers, to help the student find a solution.
- **Positive Communication:** A teacher must stay updated with recent reforms in education and technology. They should be accessible on online platforms such as email, discussion forums, and other verbal or non-verbal communication mediums.
- **Diligence in School Safety:** Teachers should be well-trained in basic first-aid skills to serve in an emergency. In the event of an uncertain condition like an earthquake, the teacher should be mindful and diligent enough to ensure the safety of the students.

Challenges in Teacher Professional Development

- **Technological Advancement:** A lack of professional training in educational technology hinders the professional development of teachers. Teachers need to know not only how to use technology as a teaching aid but also how to train their students in its use. A teacher and administrator who support technology in education are more likely to embrace new educational methods. Providing laptops or computers to teachers and students will not have beneficial effects if the school lacks the necessary network infrastructure.
- **Difficult Working Conditions:** The greatest barrier to quality professional development for teachers is difficult working conditions. Lack of adequate remuneration, overcrowded classrooms, and an absence of support in preparing teaching aids contribute to difficulties in performing efficiently, thereby affecting professional development.
- **Challenges in the School System:** The school system plays a vital role in a teacher's performance and professional development. Low status, gender bias, hierarchical dominance, rigidity in teaching style, unrelated engagements assigned to teachers, and fear of being judged by senior teachers are some instances that can negatively affect a teacher's professional development.
- **Poorly Designed Professional Development Programs:** When policymakers or implementing agencies misunderstand who the teachers are, what they teach, and how

they teach, it leads to poorly designed professional development programs that may not improve teaching quality. A one-size-fits-all approach often fails to meet the diverse needs of teachers. The needs of teachers must be considered and analyzed properly to introduce specific professional development activities that serve the purpose of quality professional development.

- **Political Influence:** Whether one agrees or not, education is an integral part of politics. Teacher professional development is not an isolated series of events, such as day-long workshops at the beginning of a school year or individual, one-off activities. It involves decision-makers at various levels who may decide on professional development programs that do not align with the needs of the teacher or their area of concern.
- **Time Constraints and Limited Resources:** Teachers often have demanding schedules filled with lesson planning, grading, meetings, and other administrative tasks. Finding time and resources for professional development can be challenging, especially when it competes with classroom responsibilities and personal commitments.
- **Resistance to Change:** Implementing new instructional strategies or adopting innovative technologies can be met with resistance from teachers who are comfortable with existing practices or skeptical about the effectiveness of change. Overcoming this resistance requires strong leadership, clear communication, and a supportive school culture that values continuous improvement and innovation.
- **Assessment and Evaluation:** Measuring the impact of professional development programs can be challenging. Traditional metrics such as workshop attendance or participant satisfaction surveys may not provide meaningful insights into the effectiveness of the training. Educators need robust assessment and evaluation mechanisms to gauge the impact of professional development on teacher practice and student learning outcomes.
- **Sustainability and Continuity:** Professional development should be viewed as an ongoing and iterative process rather than a one-time event. Sustainable professional development initiatives require long-term planning, investment, and commitment from all educational stakeholders. Continuity is essential to ensure that teachers have access to continuous learning opportunities throughout their careers.

Addressing these challenges requires a collaborative effort from policymakers, school leaders, educators, and other stakeholders. By prioritizing the professional development of teachers and addressing the barriers that inhibit effective training and support, we can foster a culture of continuous improvement and excellence in education. Teachers may hesitate to attend professional development programs that require spending time beyond regular school hours. They may prefer attending programs organized during their school duty hours. Since teaching with computer technology is a new concept, teacher educators may face the challenge of introducing technology in pre-service training. This helps in the optimum utilization of technology in various disciplines taught. A teacher's TPACK capabilities are distinct from their subject knowledge, technological knowledge, and pedagogical knowledge ; it addresses their ability to maneuver pedagogy and suitably use technology for the subject being taught.

Suggestions and Recommendations for Improving Teacher Training

- **Mentoring:** Mentoring gives new and experienced teachers the opportunity to learn from each other. It is a way for new teachers to figure out how to handle the everyday challenges of teaching in creative and effective ways. Mentoring involves activities like

observing each other teach, giving advice, and working together in the classroom. It can have a huge impact on teachers, helping them stay in the profession, increase their self-efficacy, gain more confidence, and learn innovative instructional strategies.

- **Lesson Study:** Lesson study is a teamwork approach where teachers create, study, and improve their lessons together. One teacher teaches a lesson while others observe and take notes. Later, it is discussed for the betterment of the lesson. The lesson is then taught again to a new group of students, and the whole process of observing, analyzing, and revising is repeated. Lesson study is a way for teachers to work collaboratively toward the common goal of improved instructional strategies.
- **Integrating TPACK Principles:** Teacher training programs can incorporate TPACK principles into their curriculum and instructional approaches. This integration helps teachers understand not only how to use technology tools but also how to select, adapt, and integrate them into their teaching practices in ways that enhance student learning and engagement.
- **Ample Opportunities to Practice:** Preservice teachers need opportunities to develop skills in using technology as an instructional tool (Ertmer & Ottenbreit-Leftwich, 2010, cited in Russell et al.). This can be accomplished both within the college classroom (through micro-teaching and simulated lessons) and through field experiences (practicals and student teaching). The more experiences students have, the more likely they will be to comfortably use technology to facilitate learning in their future classrooms.
- **Collaborative/Professional Learning Communities:** Working together with other teachers, both within and outside their schools, is a great way for educators to learn. When teachers collaborate and receive guidance from external experts like researchers or program developers, their professional growth is enhanced. Professional development sessions that involve teachers from the same subject or grade level tend to provide better chances for active learning and are more aligned with the teachers' overall experiences.
- **Part of Daily Work/Regularity:** Professional development should primarily happen at school and be a regular part of a teacher's daily work. It should occur regularly, not just once in a while, and should include follow-up and support to ensure continuous learning.
- **Coherent & Integrated:** Professional development should align with what teachers want to achieve, match the standards and tests they use, and be consistent with other improvements happening in education. It should also be based on the best research findings.
- **Professional Learning Communities (PLCs):** Teacher participation in PLCs is considered a promising way to provide professional development and support school improvement. PLCs consist of teachers, and sometimes school leaders, working together to improve their students' education (Prenger et al., 2017). Pooling staff with subject-wise experts for seminars and workshops will help them acquire new skills and adopt new technologies in their subjects.
- **Inquiry-Based:** Professional development should involve teachers probing questions and reflecting through active learning. It encourages teachers to engage in discussion, planning, and practice as part of their hands-on activity.
- **Teacher-Driven:** Teachers should get to decide what they want to learn about and how they want to learn it. It's about supporting both individual teachers and the whole school in reaching the goal of student learning. When teachers have a say in their learning based on their needs and interests, it's more meaningful for them, and they feel they are part of the process.

- **Self-Evaluation:** Professional development should include ways for teachers to reflect on their performance and make efforts toward improvement where required.
- **Technology Integration:** Leverage technology to enhance the accessibility, flexibility, and effectiveness of teacher training and professional development. Offer online courses, webinars, virtual conferences, and digital resources that allow educators to engage in learning anytime, anywhere, and at their own pace.
- **Cultural Competence and Equity Training:** Incorporate training on cultural competence, diversity awareness, and equity into teacher training programs. Equip educators with the knowledge, skills, and strategies needed to create inclusive learning environments, address systemic inequities, and support the diverse needs of all students.

Conclusion

As with all teacher-preparation programs, learning about technology must be included in teachers' education (not just their training) so that, in addition to knowing how to use the tools, they also know how to integrate technology into the classroom in a thoughtful way (Villegas-Reimers, 2003, cited in Caverly et al., 1997). Otherwise, teachers will simply continue to use the same teaching techniques (lecturing, for example), but now with the added use of computers (e.g., teachers who, instead of distributing handouts, now present information on a computer screen) (Villegas-Reimers, 2003).

Perhaps one of the best ways to support teacher change is by providing opportunities for them to witness how the change benefits their students (Ertmer & Ottenbreit-Leftwich, 2010). The focus must be on helping teachers understand how student-centered practices, supported by technology, impact student learning. This, in turn, has the potential to affect substantial changes in knowledge and student learning. Once teachers' mindsets have changed to include the idea that 'teaching is not effective without the appropriate use of ICT resources,' the modern education system will have reached a significant milestone.

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