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Digital Pedagogical Competence of Teacher Educators in Present Scenario

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Abstract- ***The digitization of teaching-learning processes has become more critical than ever. The practice has shifted from emergency remote teaching to deliberate integration of technology to create engaging learning experiences. In India, teacher educators are at the front line of this pedagogical shift as they need to model best practices for aspiring teachers. This paper evaluates the digital pedagogical competence of teacher educators in India. The paper further explores the difference between general digital competence and pedagogical competence. Additionally, the paper discusses the gaps that hinder teacher educators from being effective digital facilitators and offers insights on how the profession can strategically develop its competence in line with the National Educational Policy (NEP) 2020.***

Keywords: Digital Pedagogical Competence, DiPeCoS, Teacher Educators, NEP 2020, India, Digital Literacy.

I. INTRODUCTION

The educational sector is undergoing a technological revolution, where the digital technologies underpinning all aspects of human life are increasingly integral to the teaching-learning processes. Digital pedagogy refers to the use of technology as a means to an end by deliberately incorporating it into the teaching-learning processes to enhance rich learning experiences. It is, therefore, critical that definitions and methods of assessing the digital pedagogical competence of teachers be developed, given the rapid technological developments.

Enhancing the competencies of teachers in digital pedagogy is indeed a critical requirement for effective teaching and learning in the contemporary and increasingly digital society. Although the need for digital skills is felt at all levels and stages of education, the role of teacher educators is more critical since they serve as role models for aspiring teachers. Teacher educators are, therefore, the primary agents of change who should be more technologically competent than their trainees. National Education Policy 2020 underscores the need for teacher educators to leverage technology to support the learning process. Additionally, the National Professional Standards for Teachers (NPST) are the benchmark for developing pre-teacher education programs that require highly-skilled educators equipped with cutting-edge digital skills.

II. LITERATURE REVIEW: DEFINING AND MEASURING DIGITAL PEDAGOGICAL COMPETENCE

2.1 Underpinning Theories of Digital Competence

The digital competence of teacher educators has become a critical requirement in modern education as they face the formidable challenge of preparing pre-teacher education students for a technology-driven world. Generally, digital competence comprises broad areas of information and data, communication and collaboration, digital content creation, safety, and problem-solving (DigComp). However, these areas translate to specific areas when applied in educational settings. Thus, digital competence in education requires educators to design lessons using multimedia resources, collaborate online effectively, critically evaluate various digital resources, and create a safe digital learning environment for students. It is a pedagogical skill that goes beyond simply using a digital device or digital tool; rather, it requires an in-depth understanding of when and how to use the tool to maximize cognitive skills and enrich the learning experience.

Core concepts and definitions that underpin digital pedagogical competence emanate from the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Kohler. According to the framework, effective use and integration of technology in education require teachers

to have an in-depth understanding of Technology, Pedagogy, and Content. Teacher educators, therefore, need to go beyond just using technology (the tool) for delivering content and engage in higher-order pedagogical skills such as using technology to address specific pedagogical issues and using digital resources to model abstract concepts that are not easily demonstrable. A teacher educator with advanced TPCK skills would, for instance, use a digital simulation to demonstrate a unique phenomenon that could not have been successfully demonstrated using conventional approaches.

At the institutional level, the UNESCO ICT Competency Framework for Teachers identifies three progressive levels of digital competence, namely Knowledge Acquisition, Deepening of Knowledge, and Creation of Knowledge. A critical review of the literature reveals that although most teacher education programs effectively address the first two levels, they seldom address the third level of digitally empowering educators to create new knowledge and, by extension, support their students to do the same.

2.2 Assessing Digital Pedagogical Competence

Among the many challenges of understanding and addressing the digital competence needs of teachers is the lack of appropriate and reliable methods of measuring their skills. The review of the literature indicates that there is currently no comprehensive and reliable scale or instrument that can effectively capture the multidimensionality of the competencies. Researchers have, however, made significant progress in developing contemporary methods of assessing digital competence. For instance, the Teachers' Digital Competences Scale (TDC-S) has been tested and proven to effectively measure the digital competence of teachers at varying levels of education. The scale can, therefore, be used to sort teachers in terms of their digital skills for targeted interventions. Additionally, the paper highlights the inadequacy of using teacher self-reports as a method of assessing digital competence since teachers tend to overestimate their skill levels compared to their actual performance. The literature review reveals that researchers have adopted a mixed-methods and scenario-based approach to evaluating teacher digital competence. Specifically, the study reports the use of the Digital Pedagogy Competence Scale (DiPeCoS) to assess the digital pedagical competencies of a large sample of teachers (N = 1315) in India. The tool is deemed appropriate since it uses scenario-based questions to capture the decision-making strategies of the educators, making it ideal for evaluating teachers' digital competence.

Beyond the use of Likert scales and scenario-based questions, the literature reveals that there is a need to develop authentic assessments that can be used to measure digital pedagogical competence. Digital teaching portfolios, online microteaching with peer reviews, and backend learning analytics are some of the authentic assessments that could be used to measure digital pedagogical competence. The use of such assessments offers insights into how the teacher educator uses digital tools to create digital learning environments that promote inclusiveness, differentiation, and feedback. It is, therefore, critical for teacher educators to be familiar with such authentic assessments to determine their level of competence in digital pedagogy.

2.3 Contextualizing Digital Competence

When considering the digital competence needs of teacher educators in India, it is critical to take cognizance of the country-specific needs and conditions that affect how teachers engage with technology. A review of the literature reveals that the discussion on digital competence is closely tied to the concept of the digital divide. However, researchers note that India is currently facing a pedagogical divide, given the differences in how teacher education institutions (TEIs) and their students engage with technology. Although there is a high proliferation of smartphones and internet connectivity among the Indian population, the same cannot be said of the TEIs and their students.

The literature review further reveals that Indian teacher educators generally perform comparatively lower on most of the indicators of digital competence. Specifically, teacher educators are highly skilled in the use of multimedia resources and online platforms to deliver content. However, they generally lack skills in troubleshooting, collaborating online, and higher-order problem-solving with technology. It is also noteworthy that most Indian teacher educators operate in a highly regulated and examination-led system,

which influences how they use technology in teaching and learning. The review further shows that teacher educators are expected to comply with the provisions of the NEP 2020 in making their teaching-learning processes more digital. Given the multilingual nature of the Indian education system, the review highlights the need for teacher educators to not only master digital pedagogy but also be skilled in evaluating and curating local digital content to meet the linguistic needs of their students.

III. THE INDIAN SCENARIO: STRENGTHS, DEFICITS, AND CHALLENGES

A thorough assessment of the use of digital competence by teacher educators in India is presented, highlighting some strengths, as well as opportunities for improvement. Findings from studies conducted to explore digital competence include proficiency in specific areas, as well as opportunities for growth in several critical domains.

3.1 Strengths

Survey results indicate that teacher educators in India have a good foundational understanding of digital tools such as multimedia resources and online platforms. The participants demonstrated a high level of competence in using various digital tools and resources to support teaching and learning and showed an eagerness to adopt digital tools in education.

3.2 Gaps and Opportunities for Advancement

Although the respondents were highly competent in the foundational areas of digital pedagogy, weaknesses were revealed in such areas as critical thinking, collaborative online learning, and troubleshooting. The results further show that Indian teacher educators could benefit from strategies aimed at supporting them to develop their digital competence in line with the requirements of the NEP 2020.

3.3 Challenges

As highlighted by the results of the study, achieving the goals of the NEP 2020 requires overcoming several challenges in India. Since the country is a developing economy, most TEIs face challenges providing the required digital infrastructure and training to support the digital competence needs of their students. Additionally, the lack of continued professional development (CPD) opportunities for teacher educators in India further complicates the situation.

IV. STRATEGIC IMPLICATIONS

4.1 Strategic Capacity Building

Since enhancing the digital competence of teachers is a critical requirement for effective teaching and learning in the 21st century, it is paramount that institutions adopt a targeted capacity-building strategy. The findings of the study clearly show that teacher educators are comparatively strong in some areas but comparatively weak in others. As such, institutions need to conduct regular needs assessment studies to determine the most pressing capacity-building needs in their specific institutional contexts.

Professional development workshops should be designed based on the needs of the educators rather than a generic approach. To start with, professional development activities should focus on such areas as troubleshooting, evaluating digital media resources, and collaborative online learning. The capacity-building interventions should also be designed based on the levels of technology integration, as described by the SAMR model. For instance, teacher educators should be trained to not only replace traditional methods with digital tools (substitution and augmentation levels) but also modify the learning activities and completely redefine the learning experiences (modification and redefinition levels). The professional development interventions should be based on the TPACK framework and equip the educators with the knowledge of integrating technology into their pedagogy. The educators should also be encouraged to identify ways in which they could leverage technology to maximize learning outcomes. Additionally, it is important for teacher educators to have first-hand experience with digital learning environments so that they could be able to create similar conditions for their pre-service teachers. By becoming digital learners themselves, the educators would gain an insight into how their students use technology and better understand how they could support them to learn better with technology.

4.2 Using Appropriate Assessment Measures

To determine the extent to which digital competence contributes to effective teaching and learning, institutional leadership should consider using valid and reliable assessment measures such as scenario-based assessments. The scenario-based Digital Pedagogy Competence Scale (DiPeCoS) could be used to assess the educators' current level of competence and their ability to address real-life digital pedagogical scenarios. Additionally, the Teachers' Digital Competences Scale (TDC-S) could be used to identify the subset of educators who require targeted capacity-building interventions. Although the use of such assessments could be a motivating factor for educators to increase their competence levels, it is vital that the leadership takes a careful and sensitive approach to the use of such instruments so as to avoid demoralizing the educators. Additionally, institutional leadership should consider using learning analytics generated by the learning management system to evaluate the level of digital competence of each educator. The insights gained from scenario-based assessments and learning analytics could then be used to design appropriate capacity-building interventions. It is also worth noting that the assessments should be used periodically to monitor the progress and make the necessary adjustments to the interventions. Lastly, institutions could use these assessments to identify the most digitally competent teacher educators and encourage them to provide feedback to their colleagues.

4.3 Enhancing Feedback and Sharing Best Practices

Institutional leadership could play a critical role in promoting sharing of best practices and feedback among teacher educators. Communities of Practice (COPs) could be established within the teacher training institutes, such as DIETs and University Departments of Education, to promote collaboration among teacher educators. The COPs would enable the members to collaborate and share ideas, troubleshoot common challenges, and jointly design digital learning activities that align with the NPST. Additionally, it is critical that these communities be formally recognized and rewarded to encourage widespread participation and sustainability. The COPs could be used to scale up best practices and promote a collective approach to capacity building among educators.

The Communities of Practice could be used to encourage peer mentoring and cognitive apprenticeship, where more experienced and digitally competent teacher educators support their colleagues with less experience and competence. Such an approach would reduce the reliance on external resources, such as technology facilitators, and promote localized and context-specific solutions. The COPs could also be used to share information on appropriate digital tools for use in various educational settings, ranging from remote areas with limited internet connectivity to highly urbanized settings.

At a higher level, teacher training institutions could collaborate with universities and teacher training institutes to promote widespread sharing and publishing of Open Educational Resources. The OERs could include digital lesson plans that have been field tested and proven effective and could serve as the foundation for building educators' digital competence. By working together and sharing information and resources, teacher educators would be able to accelerate the development of their digital competence.

4.4 Institutional Leadership and Policy

It is the responsibility of institutional leadership to promote and support capacity-building initiatives that would help teachers become more digitally competent. The leadership should encourage and reward educators who make a conscious effort to advance their digital competence in line with the needs of the NEP 2020.

The leadership could consider revising the institutional policies that guide teaching and learning to explicitly include digital pedagogy. For instance, the current policies could be revised to encourage teacher educators to create higher-level digital content, support collaborative digital learning, and advance their digital skills through CPD. Additionally, it is important that the leadership provide the necessary digital infrastructure and technical support that would enable educators to be more productive in their professional practice.

4.5 Culturally and Contextually Responsive Digital Pedagogy

The leadership should ensure that strategies for building digital competence are responsive to the needs of the local context. Since the NEP 2020 places a lot of emphasis on the importance of providing quality and relevant education to students, it is critical that teacher educators acquire the skills to use technology to create learner-centered digital learning environments. The strategies should focus on building educators' competence in such areas as using local digital resources to support learning, using digital tools to support collaborative learning, and troubleshooting common technology-related problems. To ensure that the digital learning environments and materials are accessible to all students, the teacher educators should receive training on such topics as the use of digital tools to support students with disabilities and working with multilingual digital content to address the linguistic diversity of the Indian students. The teacher educators should also be equipped with skills to support distance and online learning, especially since the use of such approaches has significantly increased in the wake of the COVID-19 pandemic. They should also be encouraged to develop a deep understanding of how they could use technology to maximize learning outcomes and be motivated to conduct action research that would help them identify the most appropriate digital tools and resources for use in their contexts.

V. CONCLUSION

India's teacher educators play a pivotal role in supporting the country's bid to transform its education system in line with the requirements of the NEP 2020. Their digital competence is, therefore, critical to the success of the initiative. The review of the literature reveals that teacher educators currently have a good foundational competence in digital pedagogy but remain comparatively weak in such areas as critical thinking and collaborative online learning. Teacher educators in India need to advance their skills in digital pedagogy since they serve as role models for aspiring teachers and, by extension, as the agents of change in India's educational system. It is, therefore, imperative that the Indian higher education institutions implement effective and targeted capacity-building strategies to build the digital competence of the educators based on their specific competence needs.

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