

Infrastructural Facilities, Learning, and Human Resources in the Pre-Service Secondary-Level Teacher Education Programme in Rajasthan

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Abstract

The quality of pre-service secondary teacher education is critically dependent on the adequacy of infrastructural facilities, human resources, and learning resources available in training institutions. This study was undertaken to (i) analyze the infrastructure facilities in pre-service secondary teacher education programs in Rajasthan in relation to the National Council of Teacher Education (NCTE) Regulation 2014, and (ii) examine the availability of human and learning resources within these programs against the same regulatory framework. Adopting a mixed-method approach, data were collected from a sample of 60 teacher educators and 250 student teachers drawn from 11 teacher education institutions affiliated with four universities in Rajasthan. Structured questionnaires designed for teacher educators and student teachers formed the primary tools of data collection. The findings reveal several critical gaps. A significant shortage of qualified teaching and non-teaching staff was observed, leading to high pupil-teacher ratios and inadequate academic support. Nearly one-third of faculty members were perceived as lacking in subject mastery, language proficiency, and pedagogical clarity, with a notable absence of method teachers for languages, vocational subjects, arts, and physical education. Learning resources were found to be insufficient, with libraries poorly stocked with updated reference materials and journals, while information and communication technology (ICT), education technology (ET), and language labs were either non-functional or missing. Infrastructural facilities such as smart classrooms, hostels, playgrounds, and common rooms were either inadequate or below prescribed standards. Furthermore, institutional linkages with state-level educational bodies like Cluster Resource Center, Block Resource Centers, and Rashtriya Madhyamik Shiksha Abhiyan were minimal, restricting practice-oriented exposure for student teachers. The study concludes that pre-service secondary teacher education institutions in Rajasthan fall short of the NCTE (2014) requirements in infrastructure, human, and learning resources. Strengthening these dimensions is imperative for ensuring quality teacher preparation aligned with contemporary policy expectations.

Keywords: assessment, curriculum, evaluation, infrastructure, NCTE Regulations 2014, Rajasthan, student-teachers, teacher education, teacher educators

Introduction

The quality of teacher education is a decisive factor in ensuring the effectiveness, inclusivity, and sustainability of an educational system. In India, and particularly in Rajasthan, pre-service teacher education at the secondary level forms the foundation for professional learning, equipping prospective teachers with the competencies, pedagogical insights, and values essential for guiding adolescent learners. Within this context, the availability of adequate infrastructural facilities, effective learning environments, and qualified human resources plays a pivotal role in shaping the quality of teacher preparation. National frameworks such as the National Council for Teacher Education (NCTE, 2009) and the Ministry of Human Resource Development (2020) underscore the importance of moving beyond conventional inputs to ensure integrated, practice-oriented, and competency-based teacher education. Initiatives like the Integrated Teacher Education Programme (ITEP), reforms under Samagra Shiksha, and academic inputs from the State Council of Educational Research and Training reflect national and state-level efforts to

strengthen the pre-service teacher education landscape. These reforms advocate for strong institutional infrastructure, learner-centered pedagogies, and well-trained faculty to create meaningful and sustainable teacher learning.

Despite such initiatives, teacher education institutions in Rajasthan continue to face multiple challenges. Issues such as inadequate physical infrastructure, limited access to modern learning resources, and shortages of qualified faculty undermine the effectiveness of pre-service training. Moreover, learning experiences often remain theory-heavy, with insufficient emphasis on reflective practice, school-based engagement, and experiential learning. These gaps result in a disconnect between the intended goals of teacher education and the actual preparedness of future secondary-level educators. This study addresses this critical gap by examining the infrastructural facilities, learning opportunities, and human resource availability in pre-service secondary-level teacher education programs across Rajasthan.

By examining institutional capacity, faculty participation, and the perspectives of teacher educators and student-teachers, the study evaluates how far existing provisions align with the

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expectations outlined in national policy frameworks. Using a mixed-method design that combines quantitative and qualitative approaches within a single inquiry, the research addresses complex questions more comprehensively than either method could alone. Its objective is to generate evidence-based insights and practical recommendations for enhancing infrastructural and human resource support systems, while making teacher education more practice-driven, contextually relevant, and responsive to the demands of 21st-century education.

Review of the Related Literature

Infrastructure Facilities in Pre-Service Teacher Education in Relation to NCTE Regulation 2014

Infrastructure forms the backbone of quality teacher education, ensuring the availability of physical resources that create a conducive learning environment. NCTE regulation 2014 explicitly mandates adequate classrooms, multipurpose halls, libraries, laboratories, ICT facilities, and hostels as essential components for teacher education institutions (NCTE, 2014). Compliance with these infrastructural standards is vital for both accreditation and quality assurance. Several studies have highlighted persistent gaps in the implementation of these norms across states. Agarwal (2019) observed that despite policy prescriptions, a large number of teacher education institutions in India lacked adequate laboratories, ICT integration, and functional libraries. Similarly, Choudhury (2020) emphasized that infrastructural inadequacies often limit the scope for practical teaching-learning experiences, thereby weakening the linkage between theory and practice.

In the context of Rajasthan, Sharma and Jain (2018) reported disparities in infrastructural provisions among government and private teacher education institutions, with rural colleges being particularly disadvantaged in terms of physical space and modern teaching aids. Further, Mishra (2021) noted that inadequate hostel facilities and limited access to digital infrastructure remained pressing challenges, especially in remote districts, affecting both enrolment and retention of students. Collectively, these findings suggest that while NCTE 2014 has provided a robust regulatory framework, actual implementation on the ground in Rajasthan is uneven. This warrants a closer empirical examination of infrastructural realities vis-à-vis mandated standards.

Human Resources in Pre-Service Teacher Education in Relation to NCTE Regulation 2014

Human resources, comprising qualified faculty, administrative staff, and technical support, are central to the success of pre-service teacher education. According to the NCTE Regulation 2014, teacher education institutions must ensure the presence of well-qualified teacher educators with prescribed academic and professional qualifications, along with appropriate student-teacher ratios and adequate non-teaching staff (NCTE, 2014). Existing research, however, reveals substantial shortcomings. Goel (2018) highlighted that many teacher education colleges in India continue to face a shortage of professionally trained teacher educators, resulting in excessive dependence on part-time or contractual staff. Similarly, Tilak (2019) observed that limited faculty development opportunities adversely affect the pedagogical quality and innovation in teaching practices.

Specific to Rajasthan, Singh and Rathore (2020) noted that faculty positions in teacher education institutions often remain vacant for prolonged periods, especially in government-run colleges. This leads to increased workload, reduced mentoring, and lower research output. Bhatnagar (2021) further pointed out that inadequate orientation of teacher educators towards ICT integration and competency-based pedagogy prevents the effective implementation of reforms suggested under NEP 2020 and NCTE norms. Thus, while regulatory provisions exist, the quality and availability of human resources in Rajasthan's teacher education institutions often fall short of expectations, directly affecting the effectiveness of pre-service preparation at the secondary level.

Learning Resources in Pre-Service Teacher Education in Relation to NCTE Regulation 2014

Alongside infrastructure and human resources, access to rich and diverse learning resources—such as libraries, digital databases, teaching-learning materials, and ICT tools is central to equipping future teachers with the skills required for modern classrooms. The NCTE Regulation 2014 outlines clear requirements for institutions to provide updated libraries, e-resources, and ICT-based learning platforms to support both self-study and guided instruction (NCTE, 2014). Literature on Indian teacher education shows mixed progress in this area. Kumar (2017) found that many teacher training institutions still rely on outdated textbooks and limited library holdings, restricting pre-service teachers' exposure to contemporary pedagogy and research. In a comparative study, Singh and Gupta (2019) highlighted that institutions with better access to e-resources and ICT-enabled classrooms demonstrated higher levels of student engagement and research productivity.

Specific to Rajasthan, Verma (2020) observed that digital learning resources were underutilized due to both infrastructural bottlenecks and insufficient training of faculty members in ICT integration. Similarly, Bhatnagar (2021) emphasized that the lack of access to online journals, research databases, and digital content in rural teacher education colleges constrained innovation in teaching-learning practices. Thus, while the NCTE framework envisions robust learning resource systems, their practical integration in Rajasthan remains partial. Strengthening library holdings, digital repositories, and ICT literacy is critical for aligning teacher preparation with 21st-century educational demands.

Objectives

1. To analyze the infrastructure facility in pre-service secondary teacher education programs in Rajasthan in relation to the NCTE regulation 2014.
2. To examine the availability of human resources and learning resources in pre-service secondary teacher education programs in Rajasthan in relation to the NCTE regulation 2014.

Methodology

Research Design

The study adopted a mixed-method research approach, combining both quantitative and qualitative techniques to provide a comprehensive understanding of infrastructural facilities, learning resources, and human resource availability in pre-service secondary teacher education institutions of Rajasthan. This approach enabled the researcher to capture not only the statistical trends but also the contextual insights, perceptions, and experiences of stakeholders, thereby strengthening the validity of findings.

Population and Sample

The population for the study comprised universities, affiliated teacher education institutions, teacher educators, and student teachers in Rajasthan. A multi-stage sampling technique was employed to ensure diversity in terms of location, management type (government and private), and institutional size. The final sample consisted of three Universities: Jai Narayan Vyas University, Jodhpur; University of Rajasthan, Jaipur; and Mohanlal Sukhadia University, Udaipur. This sampling design allowed the study to maintain a balanced representation across urban and semi-urban contexts, as well as across government and private institutions.

1. Eleven Affiliated Teacher Training Institutions were randomly selected from the above universities.
2. 60 Teacher Educators, with an average of five educators selected from each institution.
3. 250 Student Teachers, selected proportionately from the sampled institutions to ensure representativeness.

Tools for Data Collection

To address the objectives of the study, three context-specific research instruments were developed:

1. Institute Profile: administered to Heads of Institutions to gather information on infrastructural facilities, human resources, and learning resources as per NCTE Regulation 2014.
2. Questionnaire for Teacher Educators: designed to elicit perceptions on institutional resources, adequacy of faculty, and challenges faced in delivering quality teacher education.
3. Questionnaire for Student Teachers: aimed at capturing student perspectives on the availability and utilization of infrastructural, learning, and human resources in their respective institutions.
4. All instruments were subjected to content validation by a panel of experts in teacher education and educational research. A pilot test was conducted with a small sample of institutions not included in the final study, and necessary modifications were made to ensure reliability, clarity, and contextual relevance.

Data Collection Procedure

The investigator personally visited each selected teacher education institution and devoted an average of three to four days per institution for data collection. During these visits:

1. Institute profiles were completed in consultation with Heads of Institutions.

2. Teacher educator and student teacher questionnaires were distributed and collected on-site.
3. Clarifications were provided to participants where necessary to avoid response ambiguity.
4. This direct engagement with institutions not only ensured a high response rate but also enriched the study with contextual observations.

Data Analysis

The collected data were systematically coded and tabulated.

1. Quantitative data from questionnaires were analyzed using descriptive statistics (percentages, frequencies, and means) using MS Excel tool to assess the adequacy of infrastructural, learning, and human resources in light of NCTE Regulation 2014.
2. Qualitative data obtained through open-ended responses and institutional profiles were thematically analyzed through coding of data, identifying recurring patterns, and grouping them into themes to capture patterns, challenges, and best practices reported by stakeholders. It interprets meanings across the dataset, offering insights into participants' experiences and perspectives while ensuring rigor, transparency, and contextual understanding.
3. The integration of quantitative and qualitative findings allowed for triangulation, thereby enhancing the robustness and credibility of the study.

Results

Table 1
University-Wise Teacher Educators and Student Teacher Respondents

University	Teacher training colleges	Teacher educator			Student teacher		
		Male	Female	Total	Male	Female	Total
JNVU, Jodhpur, Rajasthan	4	12	12	24	35	45	80
RUJ, Jaipur, Rajasthan	3	7	8	15	35	40	75
MLSU, Udaipur, Rajasthan	4	10	11	21	50	45	95
Total	11	29	31	60	120	130	250

Table 1 involved responses from teacher educators and student teachers across three universities in Rajasthan: JNVU Jodhpur, RUJ Jaipur, and MLSU Udaipur. A total of 11 teacher training colleges participated, comprising 60 teacher educators and 250 student teachers. Among the teacher educators, JNVU Jodhpur had 24 respondents (12 male and 12 female), RUJ Jaipur had 15 (7 male and 8 female), and MLSU Udaipur had 21 (10 male and 11 female). In terms of student teachers, JNVU Jodhpur contributed 80

participants (35 male and 45 female), RUJ Jaipur had 75 (35 male and 40 female), and MLSU Udaipur had the highest number with 95 (50 male and 45 female). This distribution reflects a balanced gender representation among teacher educators and student teachers across the institutions, with a slight predominance of female student teachers. The data also indicates active participation from both male and female educators and trainees, ensuring diverse perspectives in the analysis.

Table 2
Qualifications and Teaching Experience of Teacher Educators

Qualifications	Post Graduation	BEd	MEd	NET	PhD
Teacher educators	60 (100%)	25 (41.66%)	25 (41.66%)	25 (41.66%)	15 (25%)
Teaching experiences	0-5 years	6-10 years	11-15 years	16 years and above	
Teacher educators	15 (25%)	20 (33.33%)	20 (33.33%)	5 (8.33%)	

The analysis of teacher educators' professional qualifications and teaching experience across 11 teacher training colleges reveals a highly qualified and experienced teaching workforce. All teacher educators surveyed are postgraduates, confirming a strong academic foundation among faculty members. A total of 60 teachers fall within the broader experience range of 0 to 25 years, indicating varied levels of professional maturity within the institutions.

All teacher educators (100%) possess postgraduate qualifications, which is a basic eligibility benchmark. However, only about 42% hold professional B.Ed. or M.Ed. degrees, indicating that less than half have specialized teacher education training. Similarly, 41.66% are NET qualified, suggesting that many are not meeting the UGC's standard eligibility for higher education teaching. The proportion of Ph.D. holders is the lowest (25%), showing limited research qualifications among faculty.

The distribution shows that the majority of teacher educators have 6–15 years of teaching experience (66.66%), indicating a mid-career professional profile. About 25% are relatively new (0–5 years), bringing fresh perspectives and updated pedagogical knowledge. Only 8.33% have more than 16 years of experience, reflecting a limited pool of highly experienced mentors who could contribute to institutional leadership, advanced research, and policy development. This data indicates a balanced distribution of teacher educators across various stages of professional development, with a healthy mix of qualifications such as BEd, MEd, and NET, including PhD. The presence of mid-career and experienced faculty strengthens the quality of teacher education programmes, ensuring effective mentorship, curriculum delivery, and professional modeling for student teachers. The findings also underscore the importance of continuous professional development and advanced qualifications in building a competent and effective teacher education system.

Availability of Resources in terms of Human Resources, Learning Resources, and Infrastructure

The effectiveness of any pre-service teacher education programme is fundamentally dependent on the adequacy and quality of its resources, both human and physical. The data collected from Principals and Heads of Departments of 11 selected teacher education institutions affiliated with Jai Narain Vyas University (JNVU), Mohanlal Sukhadia University (MLSU), and Rajasthan University (RU), Jaipur, offers a comprehensive overview of staffing patterns, student-teacher enrolment, and the availability of essential facilities. Inputs from 60 teacher educators and 250 student teachers further enrich this picture by providing ground-level perspectives on the adequacy, accessibility, and utilisation of these resources.

Table 3
Status of Staff and Student Teachers in Selected Teacher Education Institutes

Name of University	Institute	Staff		Student teachers	
		Teaching	Non-teaching	Male	Female
JNVU	1	24	6	70	30
	2	5	0	70	30
	3	25	7	50	50
	4	20	4	70	30
MLSU	1	21	3	50	50
	2	19	5	60	40
	3	18	5	50	50
	4	19	5	70	30
RU Jaipur	1	13	4	44	56
	2	25	3	40	60
	3	17	3	50	50

Across all institutions, the total number of teaching staff varies significantly, ranging from as few as 5 in one college to as many as 25 in others. Non-teaching staff numbers remain relatively low, generally between 3 to 7 per institution, indicating limited administrative or support personnel relative to teaching faculty. This suggests a primary emphasis on academic functions, though it may also point to a need for strengthened administrative support structures. At JNVU, teaching staff numbers range from 5 to 25, with student-teacher enrollments ranging from 100 to 120 per institute. There is a noticeable male dominance in student enrollment in most of these colleges, with male student teachers outnumbering female students in all four institutions.

In the case of MLSU, each of the four institutions maintains a fairly balanced gender ratio among student teachers. Three out of four institutes have an equal number of male and female students (50 each), while one shows a slight male majority (60 male, 40 female). Teaching staff strength remains consistent across these institutes, generally between 18 and 21, indicating moderate faculty strength for managing academic delivery. Institutions under RU Jaipur show a contrasting pattern with greater female

student enrollment in two of the three colleges. For example, one institute reported 44 male and 56 female student teachers, while another had 40 male and 60 female students, indicating a positive trend towards female participation in teacher education in the Jaipur region. Teaching staff in RU-affiliated colleges also ranges between 13 and 25, indicating diversity in institutional capacity.

Overall, the data highlights several key trends. First, while faculty strength varies widely across institutions, most colleges maintain a teaching staff size conducive to managing student cohorts of 100 or more. Second, gender representation among student teachers reflects regional variations, with male dominance in JNVU colleges, balanced gender ratios in MLSU, and female predominance in RU Jaipur institutions. These differences may reflect socio-cultural factors, regional attitudes towards teacher education, and institutional policies encouraging gender diversity.

This analysis underscores the importance of equitable staffing patterns and gender-balanced enrollment practices in teacher education. It also suggests that while academic staff resources are generally sufficient, further strengthening of non-teaching support may enhance institutional functioning and service delivery.

Table 4
Teaching Learning Related Infrastructure Facility

Type of infrastructure facility	Yes	No
Social Science Lab	3	8
Mathematics Lab	2	9
Language Lab	0	11
Computer Lab	7	4
Psychology Lab	7	4
Physical Science Lab	5	6
Life Science Lab	5	6
Writing boards (Blackboard, Whiteboard, etc.)	11	0
ICT facilities (Computers, Projector, Printer, Scanner, Internet, etc.)	11	0
Library	11	0
Availability of reading materials, books, journals, newspapers, Novels, and others	11	0
TLM Corner	4	7

Out of the 11 institutions, only 3 have Social Science Laboratories and 2 have Mathematics Laboratories, indicating a serious lack of subject-specific practical facilities. Moreover, none of the colleges reported having a Language Lab, pointing to a complete absence of specialized infrastructure for enhancing language proficiency and communication skills, an essential component of teacher education. On a more positive note, Computer Labs and Psychology Labs are available in 7 institutions each, reflecting moderate access to technology and psychological assessment tools. Additionally, five institutions each have Physical Science and Life Science Laboratories, showing partial infrastructure support for science-related practical training, although nearly half still lack these fundamental facilities. In terms of basic classroom teaching infrastructure, all 11 institutions have writing boards (blackboards, whiteboards, etc.), confirming the presence of minimal teaching tools. Similarly, ICT facilities (including computers, projectors, printers, scanners, and internet access)

are available in all institutions, demonstrating strong integration of digital resources into the teaching-learning process.

The library infrastructure is fully established across all 11 institutions, and all institutions reported the availability of reading materials such as books, journals, newspapers, and novels, which support a rich academic environment. However, only four institutions have established a Teaching-Learning Material (TLM) Corner, indicating that the provision for creative instructional material preparation and usage is underdeveloped in most cases.

In summary, while core resources like ICT, libraries, and reading materials are universally available, there are notable gaps in subject-specific laboratories and TLM support. The absence of a Language Lab across all institutions and the limited number of Social Science and Mathematics Labs highlight critical infrastructure deficiencies that could adversely affect the quality of teacher preparation. Strengthening these areas is essential to align with contemporary pedagogical requirements and to promote experiential, hands-on learning among future educators.

Table 5*Classroom Related Infrastructure Facility*

Type of infrastructure facility	Yes	No
An adequate number of classrooms	10	1
Classroom with adequate space	11	0
Ventilated classrooms	11	0
Appropriate seating arrangements in the classroom	11	0
Reading room	9	2
Activity room	0	11

The evaluation of classroom-related infrastructure facilities in the selected teacher education institutions reveals a generally satisfactory status in terms of basic academic spaces, but certain critical components remain underdeveloped. All 10 institutions reported having an adequate number of classrooms, with one exception. This reflects a positive trend toward providing sufficient instructional spaces to accommodate student teachers. Furthermore, all institutions confirmed that their classrooms are spacious, well-ventilated, and equipped with appropriate seating arrangements, which are essential for maintaining a conducive learning environment and ensuring student comfort and participation.

However, when it comes to supporting self-study and academic enrichment, only nine institutions have a designated reading room, while two institutions lack this facility. The absence of reading

rooms in these colleges may limit opportunities for quiet study and access to extended learning resources outside the classroom setting. A notable gap is observed in the availability of activity rooms, as none of the 11 institutions reported having this facility. The lack of an activity room suggests an absence of designated space for conducting interactive, creative, or co-curricular activities, which are vital for the holistic development of student teachers and for implementing experiential and participatory pedagogies.

In conclusion, while the core classroom infrastructure appears to be adequate and well-maintained in most institutions, there are deficiencies in supportive learning environments such as reading rooms and activity spaces. Addressing these gaps is essential to promote dynamic and learner-centered teacher education that goes beyond traditional classroom instruction.

Table 6*Office Room, Auditorium, Sports, and Other Infrastructure Facilities*

Type of infrastructure facility	Yes	No
Principal's room	11	0
Staff room	11	0
Office room	11	0
Auditorium	0	11
Display and notice board	11	0
Electricity	11	0
Drinking water facility	11	0
Play ground	7	6
Sport equipment	8	3
Campus boundary	3	8

The data pertaining to office, sports, and other infrastructure facilities in the selected teacher education institutions reveal a strong administrative setup but notable shortcomings in

recreational and campus infrastructure. All 11 institutions are equipped with essential administrative facilities, including a principal's room, staff room, and office room, indicating that the

basic requirements for institutional governance and faculty support are fully met. Similarly, all colleges reported the presence of display and notice boards, electricity, and drinking water facilities, which are fundamental to daily academic operations and campus functioning. However, the data reveal a significant deficiency in larger functional and recreational spaces. None of the institutions reported the availability of an auditorium, which is a critical facility for conducting seminars, cultural events, workshops, and co-curricular activities that contribute to the professional and social development of student teachers.

With regard to sports infrastructure, only seven institutions have a playground, and eight institutions reported the availability of sports equipment, suggesting that physical education and student recreation are moderately supported. The absence of playgrounds in 6 colleges limits the scope for outdoor activities and sports-based learning, which are essential for developing teamwork, leadership, and physical well-being among student teachers. A major concern is the lack of a campus boundary wall in most institutions; only 3 out of 11 have this facility. The absence of secured boundaries may affect the safety and security of the campus environment and reflect infrastructural negligence in this regard.

In summary, while administrative infrastructure is well-established across all institutions, the lack of an auditorium, limited playgrounds, and insufficient campus security features

point to critical gaps that need urgent attention. These aspects are integral to creating a safe, engaging, and holistic learning environment for teacher education.

Reported by Teacher Educators and Student Teachers towards Availability of Resources in Teacher Education Institutions for the Secondary Stage

The availability and adequacy of resources form the backbone of quality pre-service teacher education, directly influencing the effectiveness of curriculum delivery and the professional preparedness of future teachers. In the present study, responses from 60 teacher educators and 250 student teachers offer a comprehensive overview of the human, learning, and infrastructural resources available in teacher education institutions catering to the secondary stage. The analysis highlights areas where institutions demonstrate commendable strength, such as the presence of essential teaching staff and certain learning facilities, while also revealing notable gaps in infrastructure, technological integration, and resource optimization. These variations underline the need for targeted interventions to ensure that all institutions meet the standards envisaged by national frameworks like the NCFTE (2009/2014) and the NEP (2020), thereby fostering equitable and high-quality teacher preparation across contexts.

Table 7
Teacher Educators and Student Teachers' Responses about Availability of Resources

Respondents	Teacher educator N = 60			Student teachers N = 250		
	Yes	No	Indifferent	Yes	No	Indifferent
Availability of human resources						
Adequate number of teaching staff available	45 (75%)	15 (25%)	0	195 (78%)	50 (20%)	5 (2%)
Need for a greater number of non-teaching staff	35 (58.33%)	25 (41.66%)	0	20 (8%)	200 (80%)	30 (12%)
Eligibility of recruited academic staff as per NCTE guidelines	40 (66.66%)	20 (33.33%)	0	155 (62%)	50 (20%)	45 (18%)
Availability of learning resources						
Reference books available in the library meet the requirements as per the current syllabus	25 (41.66%)	20 (33.33%)	15 (25%)	177 (70.8%)	56 (22.4%)	17 (6.8%)
An adequate number of computers and Internet access in the ICT lab	20 (33.33%)	40 (66.66%)	0	178 (71.2%)	55 (22%)	17 (6.8%)
Well-equipped educational technology lab available	10 (16.66%)	50 (83.33%)	0	165 (66%)	70 (28%)	15 (6%)
Psychology lab, language lab, math lab, science lab available as per the current syllabus	50 (83.33%)	10 (16.66%)	0	167 (66.8%)	70 (28%)	13 (5.2%)
Any constraints in your institute in taking ICT-integrated classes	40 (66.66%)	20 (33.33%)	0	120 (48%)	107 (42.8%)	23 (9.2%)
Availability of infrastructure						
Existing building plan and other requirements are available, appropriate for the current syllabus	35 (58.33%)	15 (25%)	10 (16.66%)	100 (40%)	90 (36%)	60 (24%)
A separate hostel facility is available for male or female student-teachers	20 (33.33%)	40 (66.66%)	0	90 (36%)	100 (40%)	60 (24%)

A significant majority of both groups, 75% of teacher educators and 78% of student teachers, agree that there is an adequate number of teaching staff available, indicating general satisfaction with academic staffing levels. However, when it comes to non-teaching staff, perspectives differ sharply. While 58.33% of teacher educators feel a need for more non-teaching personnel, only 8% of student teachers agree, with 80% denying such a need. This divergence suggests that the burden of administrative and operational support may be more visible to faculty than to students. Regarding eligibility as per NCTE guidelines, 66.66% of

teacher educators and 62% of student teachers believe that current academic staff meet the required standards. However, a sizeable proportion of student teachers (18%) remain indifferent, pointing to a possible lack of awareness or understanding of recruitment norms among the student body.

The data presents a mixed picture concerning learning resources. Only 41.66% of teacher educators feel that reference books in the library meet syllabus requirements, while 70.8% of student teachers find the resources adequate. This gap may indicate differing expectations or a lack of awareness among

students regarding the depth and variety of academic resources required at the professional level. The availability of computers and the Internet in ICT labs is viewed as inadequate by 66.66% of teacher educators, while 71.2% of student teachers consider it sufficient. This again reflects a possible disconnect between the usage expectations of faculty and the actual experience of students. A serious shortcoming is observed in the availability of educational technology labs, where only 16.66% of teacher educators and 66% of student teachers report having access to such facilities. This points to a critical gap in digital preparedness and experiential training in the use of educational technology.

However, the presence of subject-specific labs (psychology, language, math, science) appears relatively better, with 83.33% of teacher educators and 66.8% of student teachers acknowledging their existence in accordance with the syllabus. Regarding constraints in using ICT-integrated classes, 66.66% of teacher educators and 48% of student teachers reported facing such challenges, indicating limitations in infrastructure, training, or both. The relatively high percentage of student teachers (42.8%) denying any constraints suggests variability across institutions or a lack of direct involvement in technology-enhanced instruction.

When asked about the appropriateness of existing building plans and physical infrastructure, 58.33% of teacher educators responded positively, compared to only 40% of student teachers. A considerable proportion of student teachers (36%) expressed dissatisfaction, and 24% remained indifferent, possibly reflecting uneven infrastructure quality or limited communication about institutional planning. A key area of concern is hostel facilities. Only 33.33% of teacher educators and 36% of student teachers confirmed the availability of separate hostel arrangements for male and female student teachers. The absence of residential facilities in a large number of institutions may limit access for students from remote or underprivileged backgrounds and could impact enrollment and retention.

Discussion

The results of this study highlight the ongoing discrepancy between the actual conditions of pre-service secondary teacher education in Rajasthan and the regulatory requirements under the NCTE (2014) framework. The efficiency of teacher training is limited by several crucial aspects that remain underdeveloped, despite institutions demonstrating a basic level of compliance concerning classroom facilities, libraries, and ICT availability.

One of the primary concerns raised by the analysis is the lack of skilled and specialized faculty. Less than half of the teacher educators polled have professional qualifications such as a B.Ed. or M.Ed., and just 25% have doctorates, even though all of them have postgraduate degrees. This trend is consistent with past findings by Goel (2018) and Tilak (2019), who noted India's structural lack of professionally qualified teacher educators. As Singh and Rathore (2020) found in their research on vacant faculty posts in Rajasthan, the lack of subject-specific method teachers for languages, vocational topics, and physical education indicates a significant gap in curriculum implementation. These shortcomings jeopardize pedagogical depth, mentorship quality, and classroom creativity, while also raising student-teacher ratios.

The state of the infrastructure varies. More basic requirements, such as auditoriums, activity rooms, playgrounds, and boundary walls, are usually lacking, even if every institution reports having enough classroom space, air, and basic utilities. Similar differences were reported by Sharma and Jain (2018), who pointed out that, compared to their urban counterparts, rural teacher education colleges frequently lack contemporary amenities. Opportunities for experiential and skill-based learning are further hampered by the lack of language laboratories and the sparseness of social science and math laboratories. These flaws make it more challenging to connect with NEP 2020's focus on competency-driven and practice-oriented teacher education.

The availability and use of learning resources also appear inadequate. Although libraries exist in all institutions, both teacher educators and student teachers point to outdated collections and insufficient reference materials. The divergence in perceptions—where students report higher satisfaction with library holdings

than educators—suggests differing levels of awareness regarding the depth of academic resources required. As Verma (2020) and Bhatnagar (2021) emphasize, limited digital resources and underutilized ICT facilities remain a major barrier to bridging the digital divide in teacher education. This study reinforces those conclusions, with many respondents noting difficulties in ICT-integrated teaching, despite the reported presence of computer labs and internet facilities.

Another important finding relates to institutional linkages. Very few colleges maintain partnerships with CRCs, BRCs, DIETs, or RMSA, thereby restricting school-based exposure and reflective practice. This lack of systemic integration reflects what Choudhury (2020) termed the "theory-practice gap" in teacher education. Without structured field engagement, student teachers remain ill-prepared to translate pedagogical knowledge into classroom realities.

Conclusion

This study set out to examine the adequacy of infrastructural facilities, human resources, and learning resources in pre-service secondary teacher education programmes in Rajasthan in light of the NCTE Regulation, 2014. The findings clearly demonstrate that while basic academic provisions such as classrooms, libraries, and ICT facilities are in place, significant gaps remain in advanced infrastructure, subject-specific laboratories, and student support systems. The shortage of qualified and specialized faculty, coupled with limited non-teaching support, undermines the academic and administrative efficiency of institutions. Similarly, underdeveloped learning resources—particularly the absence of functional language labs, updated reference materials, and robust digital platforms—hinder the development of 21st-century teaching competencies among student teachers. The results also point to weak institutional linkages with state-level agencies, restricting the scope for practice-based, field-oriented teacher preparation. These shortcomings mirror broader challenges highlighted in previous studies and underscore the urgent need for systemic reforms. To meet the vision of the NEP 2020 and the expectations of the NCTE framework, teacher education institutions in Rajasthan must move beyond basic compliance and embrace a more holistic model that integrates infrastructure, professional development, and school-based engagement.

Recommendations

1. Ensure adequate recruitment of qualified faculty, including subject specialists, and provide continuous professional development to enhance pedagogical and ICT competencies.
2. Upgrade libraries, laboratories, and ICT infrastructure with smart classrooms, digital resources, and functional labs to meet NCTE and NEP 2020 standards.
3. Establish strong institutional linkages with the State Council of Educational Research and Training, DIETs, CRCs, BRCs, and schools to enhance field engagement, internships, and practice-based learning.
4. Policy should mandate and fund the establishment of functional language labs and subject-specific laboratories in all institutions as a condition for accreditation.
5. Policy should ensure periodic monitoring and evaluation of infrastructural and human resource provisions, linking compliance with sustained recognition and financial support.

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