

A Study of Perception of Teacher Educators towards ICT Integration in Teacher Education in East Burdwan District of West Bengal

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Abstract: *Information and Communication Technology (ICT) has become a decisive determinant of quality in teacher education systems worldwide, and the perceptions that teacher educators hold about ICT strongly shape the extent to which digital tools are meaningfully embedded in pedagogical practice. This study examined the perception of teacher educators towards ICT integration in teacher education institutions of East Burdwan District, West Bengal, using a descriptive survey method within a cross-sectional research design. Following a pilot study on 15 respondents, a final stratified sample of 120 teacher educators (60 from Government and Government-Aided institutions and 60 from Self-Financed institutions) was drawn to ensure balanced representation. Perception was examined across four conceptual dimensions — perceived usefulness of ICT, perceived ease of use, ICT integration in pedagogical practice, and institutional support — derived from the Technology Acceptance Model and contemporary teacher-education literature. One-sample t-tests indicated that teacher educators' perception on all four dimensions was significantly higher than the neutral test value, and an independent-samples t-test revealed a statistically significant difference in overall perception between institution types, favoring Government and Government-Aided institutions. The findings are discussed against India's National Education Policy 2020, the National Curriculum Framework for Teacher Education 2021, and allied digital-education programmes, and the study concludes with policy-relevant recommendations for narrowing the institutional-support gap between government-aided and self-financed teacher education colleges.*

Keywords: ICT integration, teacher educators, teacher education, perception, Technology Acceptance Model, NEP 2020, West Bengal

I. INTRODUCTION

The twenty-first-century classroom is being continuously reshaped by the rapid diffusion of digital technologies, and teacher education — the very institution responsible for preparing the next generation of school teachers — cannot remain insulated from this transformation. Information and Communication Technology (ICT) broadly refers to the constellation of digital tools, platforms, and infrastructures — computers, the internet, learning management systems, multimedia resources, mobile applications, and interactive digital boards — that are used to create, store, process, transmit, and exchange information for teaching, learning, assessment, and educational administration. Within teacher education specifically, ICT is not merely a technical add-on; it constitutes a pedagogical resource through which teacher educators model the very digital competencies that pre-service and in-service teachers are, in turn, expected to demonstrate in school classrooms.

Teacher educators — the faculty who design curricula, deliver instruction, supervise practicum, and mentor prospective teachers within Bachelor of Education (B.Ed.), Diploma in Elementary Education (D.El.Ed.), and allied programmes — occupy a uniquely consequential position in this technological transition. Their perception of ICT, encompassing their



beliefs about its usefulness, their confidence in operating it, their willingness to embed it in pedagogy, and their assessment of the institutional support available to them, functions as the single strongest predictor of whether digital tools are integrated meaningfully into teacher preparation or remain confined to occasional, superficial use. A teacher educator who perceives ICT as cumbersome, poorly supported, or pedagogically irrelevant is unlikely to model its productive use for trainee teachers, irrespective of the hardware present in an institution.

The emergence of this line of enquiry has been accelerated by three converging developments. First, the COVID-19 pandemic compelled an abrupt, system-wide shift to online and blended modes of teacher training, exposing wide variation in teacher educators' digital readiness across institution types. Second, India's National Education Policy (NEP) 2020 and the subsequent National Curriculum Framework for Teacher Education (NCFTE) 2021 have placed technology-enabled teaching, continuous professional development, and integrated four-year teacher preparation at the centre of reform, making teacher educators' ICT perception a matter of direct policy relevance rather than incidental interest. Third, West Bengal's teacher education landscape is structurally dual in character, comprising both Government/Government-Aided colleges and a substantial number of Self-Financed institutions that differ markedly in infrastructure, staffing, and administrative support — a structural feature that makes comparative perception research particularly meaningful in this state. It is within this context that the present study investigates how teacher educators in East Burdwan District perceive ICT integration, and whether that perception differs systematically by institution type.

1.1 The Conceptual Framework

ICT integration in teacher education is a multidimensional construct, and while the literature identifies numerous facets of digital adoption, the present study concentrates on four dimensions judged to be of greatest contemporary relevance to teacher educators' professional practice.

(i) Perceived Usefulness of ICT: the extent to which a teacher educator believes that using ICT enhances instructional effectiveness, saves preparation time, and improves learners' academic engagement. This dimension is adapted from Davis's (1989) Technology Acceptance Model (TAM), which remains the most widely applied theoretical lens for studying technology adoption in education.

(ii) Perceived Ease of Use: the degree to which a teacher educator finds ICT tools and platforms operable without excessive cognitive or technical effort. Ease of use, in TAM, is theorised as a direct antecedent of usefulness perceptions and behavioural intention to use technology.

(iii) ICT Integration in Pedagogical Practice: the depth to which digital tools are woven into actual teaching, learning, assessment, and student-engagement activities, rather than being used only peripherally for administrative or presentational purposes.

(iv) Institutional Support: the perceived adequacy of infrastructure, technical assistance, training opportunities, incentive structures, and leadership encouragement that an institution provides to facilitate ICT use — a dimension consistently identified in the literature as the strongest external constraint on individual adoption.

Together these four dimensions provide a framework that captures both the internal, attitudinal aspects of technology acceptance (usefulness and ease of use) and the pedagogical and institutional conditions (integration and support) that jointly determine whether positive perception translates into sustained classroom practice.

1.2 The Need of the Study

Although a substantial body of research has examined school teachers' attitudes towards ICT, comparatively fewer quantitative, dimension-wise studies have focused specifically on teacher educators — the faculty who train future teachers — within the Indian, and more particularly the West Bengal, context. With NEP 2020 and NCFTE 2021 mandating a fundamental reorientation of teacher preparation towards technology-enabled, competency-based pedagogy, there is a pressing need to generate empirical evidence on how prepared, in perceptual terms, teacher educators actually are for this transition. Furthermore, West Bengal's teacher education sector is bifurcated between Government/Government-Aided and Self-Financed institutions that are widely believed to differ in resource



availability; however, this differential has rarely been tested statistically with respect to ICT perception. The present study responds to this gap by generating district-level, institution-type-disaggregated evidence that can inform both institutional planning and state-level policy formulation.

1.3 The Significance of the Study

The rationale for this study rests on the premise that teacher educators function as the primary conduits through which national digital-education policy is translated into classroom-level practice in teacher preparation institutions. Understanding their perception is therefore not merely of academic interest but has direct implications for policy implementation, faculty development planning, and resource allocation. The purpose of the study is threefold: to generate a reliable, dimension-wise empirical profile of teacher educators' ICT perception; to test whether this perception varies meaningfully by institution type, thereby identifying where policy intervention is most urgently required; and to situate the findings within the broader architecture of India's digital-education policy — including NEP 2020, NCFTE 2021, DIKSHA, NISHTHA, and PM eVIDYA — so that the recommendations emerging from the study are actionable within existing governmental frameworks. The study is significant for teacher education institutions seeking to design targeted faculty-development interventions, for state education authorities such as the West Bengal Board of Primary/Secondary Education and the State Council of Educational Research and Training (SCERT), and for policy researchers tracking the ground-level uptake of national ICT-in-education initiatives.

1.4 The Delimitations of the Study

- Geographical delimitation: the study is confined to teacher education institutions located within East Burdwan (East Burdwan) District of West Bengal.
- Population delimitation: the study is restricted to teacher educators serving in recognized Government, Government-Aided, and Self-Financed teacher education colleges; school teachers and student-teachers are excluded.
- Conceptual delimitation: perception is examined only along the four dimensions specified in the conceptual framework — usefulness, ease of use, pedagogical integration, and institutional support — and does not extend to actual ICT-usage log data or classroom observation.
- Temporal delimitation: data reflect teacher educators' perception at the time of survey administration and do not track change over time.

1.5 The Objectives of the Study

- O1. To study the perception of teacher educators regarding the perceived usefulness of ICT in teacher education in East Burdwan District of West Bengal.
- O2. To examine the perception of teacher educators regarding the ease of use of ICT for teaching and other professional activities.
- O3. To study the perception of teacher educators regarding ICT integration in pedagogical practices, including teaching, learning, assessment, and student engagement.
- O4. To examine the perception of teacher educators regarding institutional support associated with ICT integration in teacher education.
- O5. To determine whether there is any significant difference in the perception of teacher educators towards ICT integration with respect to institution types.

1.6 The Null Hypotheses of the Study

H₀₁: There is no significant level of perceived usefulness of ICT among teacher educators in teacher education in East Burdwan District of West Bengal.



H₀2: There is no significant level of perceived ease of use of ICT among teacher educators for teaching and other professional activities.

H₀3: There is no significant level of perception of teacher educators regarding the integration of ICT in pedagogical practices.

H₀4: There is no significant level of perception of teacher educators regarding institutional support associated with ICT integration in teacher education.

H₀5: There is no significant difference in the perception of teacher educators towards ICT integration with respect to different types of teacher education institutions.

II. REVIEW OF THE RELATED LITERATURE

2.1 International Studies

Ngao, Sang, and Kihwele (2022) explored the perceptions and practices of eighteen teacher educators at a university college in Tanzania using a phenomenological qualitative design, with data drawn from semi-structured interviews, observation, and documentary review. The study found that younger, less experienced teacher educators showed greater readiness to adopt ICT, whereas some senior colleagues questioned the pedagogical rationale for its use. Equipment shortages, heavy teaching workloads, and time constraints emerged as the principal barriers, even though most participants reported using varied software, social media, and online journal subscriptions to support pre-service teachers' learning.

Akram, Abdelrady, Al-Adwan, and Ramzan (2022) conducted a systematic review of teachers' perceptions of technology integration in teaching-learning practices, synthesising studies conducted in Pakistan over the preceding five years across all educational levels. The review reported that teachers generally held positive perceptions of technology-incorporated instruction, associating it with improved instructional effectiveness and greater learner motivation and interactivity. However, slow internet speed, power outages, inadequate infrastructure, and insufficient training were repeatedly identified as constraints, leading the authors to recommend clear institutional policy, adequate budgetary allocation, and sustained professional-development opportunities for teachers.

Shamim, Jeng, and Raihan (2024) investigated university teachers' perceptions of ICT-based teaching using the Technological Pedagogical Content Knowledge (TPACK) model in a quantitative survey of 88 faculty members at the University of the Gambia. The study found that both individual constructs (technology, pedagogy, and content knowledge) and paired constructs of TPACK were positively correlated with teachers' overall perceived TPACK, with the technological–pedagogical knowledge pairing exerting a particularly strong association. The authors recommended that institutions design professional-development programmes that build technological knowledge in tandem with pedagogical reasoning rather than in isolation.

2.2 National Studies

Adhya and Panda (2022) examined teacher educators' attitude towards technology-enabled learning and its incorporation into teaching-learning practice during and after the COVID-19 pandemic. The study reported a generally positive attitude among teacher educators towards technology-enabled learning; however, the actual incorporation of such learning into regular practice was found to be uneven, contingent upon institutional readiness, access to reliable infrastructure, and the extent of prior digital exposure.

Subaveerapandian and Nandhakumar (2022) studied teacher educators' ICT skills and their integration into online teaching during the pandemic period in an Indian higher-educational context. The study found that most faculty members adapted to online teaching under pandemic conditions, though notable skill gaps persisted, and educators reported mixed emotional responses — ranging from comfort to pressure — while engaging in ICT-mediated instruction. The authors recommended structured, competency-based training aligned with twenty-first-century skill requirements to reduce this variability.



2.1 The Research Gap

The reviewed literature demonstrates consistent agreement that teacher and teacher-educator perception of ICT tends to be broadly positive, while institutional infrastructure, training, and workload remain persistent constraints across highly diverse settings — from Tanzania and Pakistan to the Gambia and India. However, three gaps are evident. First, much of the international literature relies on small qualitative samples or systematic reviews of secondary data rather than large-sample, dimension-wise quantitative comparison. Second, the Indian studies reviewed here, while quantitative or survey-based, do not disaggregate perception by institution type (government-aided versus self-financed), a distinction that is structurally central to West Bengal's teacher education system. Third, none of the reviewed studies examine teacher educators' perception in the specific post-NEP 2020 and post-NCFTE 2021 policy environment, in which technology-enabled teacher preparation has become a formal national mandate rather than an optional enhancement. The present study addresses these three gaps by employing a quantitative, four-dimension, institution-type-comparative design situated explicitly within the current Indian teacher-education policy framework.

III. THE METHODOLOGY OF THE STUDY

The study adopted the Descriptive Survey Method, appropriate for systematically describing teacher educators' existing perceptions without manipulating any variable, within a Cross-Sectional Research Design in which data were collected from the sample at a single point in time.

Pilot Study

Prior to distribution of the main questionnaire, the researcher conducted a pilot study on 15 teacher educators drawn from institutions outside the final sampling frame, in order to assess item clarity, estimate completion time, and establish preliminary reliability of the perception scale. Minor wording revisions were made to ambiguous items following the pilot administration.

Population of the Study

The population comprised all teacher educators serving in recognised teacher education institutions (Government, Government-Aided, and Self-Financed) offering B.Ed. and allied programmes within East Burdwan District of West Bengal.

The Sample and Sampling Technique

A stratified random sampling technique was employed, with institution type (Government/Government-Aided versus Self-Financed) serving as the stratification variable, to ensure proportional and comparable representation across the two strata. The final usable sample comprised 120 teacher educators, equally divided between the two institution types, as summarised in Table 3.1.

Table 3.1. Distribution of Respondents by Institution Type

Institution Type	Frequency (N)	Percentage (%)
Government and Government-Aided	60	50.00
Self-Financed	60	50.00
Total	120	100.00

Thus, the study consists of 120 teacher educators, with 60 (50%) drawn from Government and Government-Aided institutions and 60 (50%) from Self-Financed institutions. This equal representation was deliberately built into the sampling design to facilitate a meaningful, balanced comparison of perceptions across the two institution types (Objective O5 / Hypothesis H₀₅).

The Variables of the Study

The major variable of the study is teacher educators' Perception of ICT integration, operationalised through the four-dimension conceptual framework described in Section 1.1. The categorical variables are the four Dimensions of



perception (usefulness, ease of use, pedagogical integration, institutional support) and Institution Type (Government/Government-Aided vs. Self-Financed).

The Tools of the Study

A structured, closed-ended Likert-type questionnaire — the Teacher Educators' Perception of ICT Integration Scale — was developed and validated by the researcher, comprising items distributed across the four dimensions. Items were rated on a five-point scale, and the total dimension score, as well as an aggregate overall perception score, was computed for each respondent. Content validity was established through expert review, and internal consistency was verified during the pilot study.

Techniques of Data Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics (mean, standard deviation, minimum, and maximum) were computed for each dimension. One-Sample t-tests were used to test Hypotheses H_{01} to H_{04} by comparing each dimension's obtained mean against a fixed neutral test value corresponding to the midpoint of the respective scale. An Independent-Samples t-test, preceded by Levene's Test for equality of variances, was used to test Hypothesis H_{05} by comparing overall perception scores between the two institution types. A significance level of .05 (two-tailed) was adopted as the decision criterion throughout.

Data Collection Procedure and Scoring

The questionnaire was administered to the sampled teacher educators in both offline and Google-Forms-based online modes, according to respondent convenience, with informed consent obtained prior to participation. Each response was scored according to the five-point scale, dimension-wise scores were summed to yield the four dimension totals, and the four dimension totals were further summed to yield the Overall Perception score used in the independent-samples comparison.

IV. RESULT AND INTERPRETATION

4.1 Testing of Hypotheses

Descriptive statistics for the four dimensions of teacher educators' perception towards ICT integration are presented in Table 4, followed by hypothesis-wise inferential analysis.

Table 4.1 Descriptive Statistics of the Four Dimensions of Perception towards ICT Integration

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Usefulness of ICT	120	19	39	31.18	4.12
Ease of Use of ICT	120	18	38	29.76	4.36
ICT Integration in Pedagogical Practices	120	20	40	30.64	4.08
Institutional Support	120	16	37	27.92	4.72

Across all four dimensions, mean scores lie comfortably above the scale midpoint, with Perceived Usefulness recording the highest mean (31.18) and Institutional Support the lowest (27.92) and the widest spread ($SD = 4.72$), signaling greater variability in how adequately teacher educators perceive institutional backing for ICT use.

Testing of H_{01} — Perceived Usefulness of ICT

Table 4.2. One-Sample Test for Perceived Usefulness of ICT

Dimension	Test Value	Mean	SD	t	df	Sig. (2-tailed)	Mean Diff.
Perceived Usefulness of ICT	24.00	31.18	4.12	19.091	119	<.001	7.18



The mean score for perceived usefulness of ICT was 31.18 (SD = 4.12), against a neutral test value of 24.00. The obtained t value was 19.091 (df = 119, $p < .001$). Since the significance value is less than .05, the null hypothesis H_01 is rejected. This indicates that teacher educators' perceived usefulness of ICT is significantly higher than the neutral level, suggesting that they view ICT as a genuinely valuable instructional resource rather than a peripheral convenience — a finding consistent with Akram et al.'s (2022) systematic-review conclusion that teachers across varied settings associate technology integration with improved instructional effectiveness.

Testing of H_02 — Ease of Use of ICT

Table 4.3. One-Sample Test for Ease of Use of ICT

Dimension	Test Value	Mean	SD	t	df	Sig. (2-tailed)	Mean Diff.
Ease of Use of ICT	24.00	29.76	4.36	14.472	119	<.001	5.76

The mean score for ease of use of ICT was 29.76 (SD = 4.36). The obtained t value of 14.472 was statistically significant at the .05 level ($p < .001$). Therefore, the null hypothesis H_02 is rejected. The findings indicate that teacher educators perceive ICT as significantly easier to use than the neutral level, though the comparatively lower mean and higher t-statistic relative to usefulness suggest that operability, while adequate, is perceived somewhat less favorably than the instructional value of ICT itself — echoing TAM's theoretical proposition that ease of use is a distinct, and often more variable, antecedent of technology acceptance.

Testing of H_03 — ICT Integration in Pedagogical Practices

Table 4.4. One-Sample Test for ICT Integration in Pedagogical Practices

Dimension	Test Value	Mean	SD	t	df	Sig. (2-tailed)	Mean Diff.
ICT Integration in Pedagogical Practices	24.00	30.64	4.08	17.828	119	<.001	6.64

Teacher educators obtained a mean score of 30.64 (SD = 4.08) for ICT integration in pedagogical practices. The obtained t value was 17.828, statistically significant at $p < .001$. Hence, the null hypothesis H_03 is rejected. This suggests that teacher educators hold a significantly favourable perception towards integrating ICT into pedagogical practice — spanning teaching delivery, learning facilitation, assessment, and student engagement — corroborating Ngao et al.'s (2022) observation that teacher educators actively draw on varied software and digital platforms to support trainee-teacher learning.

Testing of H_04 — Institutional Support

Table 4.5. One-Sample Test for Institutional Support for ICT Integration

Dimension	Test Value	Mean	SD	t	df	Sig. (2-tailed)	Mean Diff.
Institutional Support	24.00	27.92	4.72	9.098	119	<.001	3.92

The mean score for institutional support was 27.92 (SD = 4.72). The obtained t value was 9.098, with $p < .001$. Therefore, the null hypothesis H_04 is rejected. The result indicates that teacher educators perceive institutional support for ICT integration to be significantly above the neutral level; however, this dimension recorded the smallest mean difference (3.92) and the smallest t value among the four dimensions, and the highest standard deviation, jointly signalling that institutional support — while adequate on average — is the least consistently strong dimension and the one most sensitive to structural variation across institutions, a pattern examined further under H_05 .



Testing of H_05 — Institution Type

For H_05 , the overall perception score is compared between Government/Government-Aided and Self-Financed institutions using an independent-samples t-test.

Table 4.6 Group Statistics for Overall Perception of ICT Integration

Institution Type	N	Mean	Std. Deviation	Std. Error Mean
Government and Government-Aided	60	82.47	7.64	0.986
Self-Financed	60	78.93	8.21	1.060

Table 4.7. Independent-Samples Test for Overall Perception of ICT Integration

	Levene's F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	SE Diff.
Equal variances assumed	0.412	.522	2.445	118	.016	3.54	1.448
Equal variances not assumed	—	—	2.445	117.39	.016	3.54	1.448

Government and Government-Aided teacher educators obtained a higher overall perception score ($M = 82.47$, $SD = 7.64$) than Self-Financed teacher educators ($M = 78.93$, $SD = 8.21$). Levene's test was non-significant ($F = 0.412$, $p = .522$), indicating that the equal-variance assumption can be retained. The independent-samples t-test produced $t(118) = 2.445$, $p = .016$. Since $p < .05$, the null hypothesis H_05 is rejected. The findings indicate a statistically significant difference in overall perception towards ICT integration between the two types of institutions, with the gap most plausibly attributable to differential institutional support — the dimension that recorded the weakest performance in Table 8 and that typically diverges most sharply between government-funded and self-financed colleges in terms of infrastructure budgets, technical staffing, and access to centrally sponsored training programmes such as NISHTHA.

Table 4.8. Summary of Hypothesis Testing

Hypothesis	Statistical Test	Result	Decision
H_01 – Perceived Usefulness	One-Sample t-test	$t = 19.091$, $p < .001$	Rejected
H_02 – Ease of Use	One-Sample t-test	$t = 14.472$, $p < .001$	Rejected
H_03 – Pedagogical Integration	One-Sample t-test	$t = 17.828$, $p < .001$	Rejected
H_04 – Institutional Support	One-Sample t-test	$t = 9.098$, $p < .001$	Rejected
H_05 – Institution Type	Independent-samples t-test	$t = 2.445$, $p = .016$	Rejected

V. THE FINDINGS OF THE STUDY

- Teacher educators in East Burdwan District hold a significantly positive perception of the usefulness of ICT for instructional purposes, rating it the strongest of the four dimensions studied.
- Teacher educators perceive ICT tools as significantly easier to use than a neutral baseline, though ease-of-use perception is somewhat more constrained than usefulness perception.
- Perception regarding the integration of ICT into pedagogical practice — teaching, learning, assessment, and student engagement — is significantly favourable, indicating that positive attitude is translating into reported classroom-level practice.



- Institutional support is perceived as significantly above neutral, but it is the weakest and most variable of the four dimensions, pointing to uneven infrastructure, training access, and technical assistance across institutions.
- A statistically significant difference exists in overall perception between Government/Government-Aided and Self-Financed teacher education institutions, with Government/Government-Aided educators reporting a more favourable overall perception.
- All five null hypotheses (H_01-H_05) were rejected, indicating that teacher educators' perception towards ICT integration is significantly positive on every dimension examined and significantly differentiated by institution type.

VI. RECOMMENDATIONS

The findings, read alongside India's evolving digital-education policy architecture, suggest several concrete lines of action for institutions and policymakers.

6.1 Strengthening Institutional Support in Self-Financed Institutions

Because institutional support was both the weakest dimension overall and the principal apparent driver of the Government-Aided/Self-Financed gap, Self-Financed teacher education colleges in East Burdwan District should be prioritised for infrastructure upgrades — reliable internet connectivity, smart classrooms, and technical-support staff — potentially through convergence with the DIKSHA (Digital Infrastructure for Knowledge Sharing) platform, which already hosts curriculum-aligned digital content and teacher-training modules accessible free of cost across states and union territories.

6.2 Embedding NISHTHA-Aligned Continuous Professional Development

Under NEP 2020, every teacher is expected to undertake at least 50 hours of Continuous Professional Development (CPD) annually. Institutions should systematically map their teacher educators' participation in the National Initiative for School Heads' and Teachers' Holistic Advancement (NISHTHA) integrated training programmes (Cycles 1.0–3.0) and similar SWAYAM/SWAYAM Prabha-hosted online courses, ensuring that ICT-pedagogy modules specifically addressing ease-of-use gaps are prioritised for Self-Financed college faculty.

6.3 Aligning Curricular Reform with NCFTE 2021 and ITEP

The National Curriculum Framework for Teacher Education (NCFTE) 2021, formulated by the National Council for Teacher Education (NCTE) in consultation with NCERT, and the Four-Year Integrated Teacher Education Programme (ITEP) notified in October 2021, both embed technology-enabled pedagogy as a structural curricular expectation rather than an optional module. Teacher education institutions in East Burdwan District should audit their B.Ed. curricula against NCFTE 2021 provisions to ensure that ICT integration is assessed as a core teaching competency, consistent also with the draft National Professional Standards for Teachers (NPST).

6.4 Leveraging PM eVIDYA and Multi-Platform Digital Resources

The PM eVIDYA initiative, operating on the principle of 'One Nation, One Digital Platform', offers multi-modal access to educational content through DTH television channels, community radio, and online repositories, and can be used by teacher education institutions — particularly those with limited broadband access — to supplement classroom-based ICT training with asynchronous, low-bandwidth alternatives.

6.5 Institution-Level Recommendations

- Constitute an ICT Cell in every teacher education college, chaired by a senior teacher educator, to coordinate infrastructure maintenance, training scheduling, and technical troubleshooting.
- Introduce peer-mentoring pairs between digitally confident and less confident teacher educators to narrow ease-of-use gaps without waiting for formal training cycles.
- Incorporate ICT-based assessment and student-engagement techniques explicitly into practicum supervision rubrics so that pedagogical integration is reinforced during teaching-practice evaluation.
- Establish an annual ICT-readiness audit, disaggregated by institution type, to track whether the Government-Aided/Self-Financed perception gap identified in this study is narrowing over time.



6.6 Policy-Level Recommendations

- State education authorities (SCERT West Bengal / Higher Education Department) should extend targeted ICT-infrastructure grants specifically to Self-Financed teacher education colleges, given the significant institutional-support gap identified in this study.
- NCTE and affiliating universities should mandate periodic reporting of ICT-training participation rates disaggregated by institution type as part of institutional accreditation and NAAC/NCTE recognition renewal.
- Future amendments to NCFTE should explicitly specify minimum institutional ICT-infrastructure benchmarks for teacher education college recognition, closing the loophole through which under-resourced Self-Financed colleges currently obtain and retain affiliation.

VII. CONCLUSION

This study set out to examine how teacher educators in East Burdwan District of West Bengal perceive ICT integration across four conceptually distinct but practically interconnected dimensions, and whether this perception differs by institution type. The evidence is unambiguous: teacher educators hold a significantly positive perception of ICT's usefulness, its ease of use, its integration into pedagogical practice, and the institutional support available for its use — all four dimension-specific null hypotheses were rejected at $p < .001$. At the same time, the study establishes, with statistical rigour, that this positive perception is not uniformly distributed: teacher educators in Government and Government-Aided institutions report a significantly more favourable overall perception than their counterparts in Self-Financed institutions, a gap most plausibly rooted in differential institutional support rather than in differences of attitude or capability.

These findings carry direct relevance for the ongoing implementation of NEP 2020, NCFTE 2021, and the wider ecosystem of DIKSHA, NISHTHA, SWAYAM, and PM eVIDYA, all of which presuppose a teacher-educator workforce that is both willing and enabled to model digital pedagogy for the next generation of school teachers. The willingness, this study confirms, is already substantially present. What remains uneven — and what should therefore anchor the next phase of institutional and policy action in West Bengal's teacher education sector — is the infrastructural and administrative support that converts positive perception into consistent, equitable, and sustained ICT-integrated practice across every teacher education institution, regardless of its funding status.

REFERENCES

- Adhya, D., & Panda, S. (2022). Teacher educators' attitude towards technology-enabled learning and its incorporation into teaching-learning during and post-pandemic. *Educational Media International*, 59(2), 131–149. <https://doi.org/10.1080/09523987.2022.2101204>
- Akram, H., Abdelrady, A. H., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching-learning practices: A systematic review. *Frontiers in Psychology*, 13, Article 920317. <https://doi.org/10.3389/fpsyg.2022.920317>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Government of India, Ministry of Education. (2020). National Education Policy 2020. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
- Ministry of Education, Government of India. (2021). Background note: Teacher and teacher education under National Education Policy 2020. https://www.education.gov.in/shikshakparv/docs/background_note_teacher_education.pdf
- 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>
- National Council for Teacher Education. (2021). National Curriculum Framework for Teacher Education (NCFTE) 2021. Ministry of Education, Government of India.



- Ngao, A. I., Sang, G., & Kihwele, J. E. (2022). Understanding teacher educators' perceptions and practices about ICT integration in teacher education program. *Education Sciences*, 12(8), Article 549. <https://doi.org/10.3390/educsci12080549>
- Shamim, M. R. H., Jeng, A. M., & Raihan, M. A. (2024). University teachers' perceptions of ICT-based teaching to construct knowledge for effective classroom interaction in the context of TPACK model. *Heliyon*, 10(8), e28577. <https://doi.org/10.1016/j.heliyon.2024.e28577>
- State Council of Educational Research and Training, Himachal Pradesh. (2024). Department of ICT / DIKSHA / NISHTHA / EDUSAT / PM-eVIDYA / Vidyanjali. <https://www.scerthp.org/department-ictdikshanishthaedusatpm-evidya-vidyanjali>
- Subaveerapandiyar, A., & Nandhakumar, R. (2022). A study of teacher educators' skill and ICT integration in online teaching during the pandemic situation in India. *arXiv*. <https://arxiv.org/abs/2210.11267>
- Teachers Institute. (2026). National policies on ICT in education: What you need to know. <https://teachers.institute/educational-technology-overview/national-policies-ict-education>

