

Status of ICT Integration in Teacher Education Institutions of Assam: An Exploratory Study

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Abstract

The present study is an attempt to explore the status of ICT integration in institutional activities, teaching, assessment, professional development, and internship of Teacher Education Institutions (TEI) of Assam. A survey method was used for the study. The sample consists of four TEIs, 20 Teacher Educators (TE) and 80 Trainees selected randomly from TEIs affiliated to Guwahati University of Assam, India. Three self-developed questionnaires were used by the investigator for data collection. The collected data were analyzed by using frequency, average and percentage and accordingly interpretations are made. The study revealed that- i) All the TEIs have minimum ICT facilities and resources available are in functional condition; ii) majority of TEIs use ICT for performing various institutional activities; iii) majority of the teacher educators were found sometimes using ICT for teaching-learning, assessment, and for professional development; iv) most of the trainees were found not using a variety of ICT devices and applications for learning and teaching during internship and v) lack of technical skills among teacher educators and trainees are major challenges in the path of effective utilization of ICT. The study has proposed for developing techno-pedagogical skills of teacher educators and trainees to effectively integrate ICT in teaching-learning, administration, assessment and evaluation as well as professional development.

Keywords: ICT, Integration of ICT, Teacher Educators, Teacher Education Institutions, Trainees.

Introduction

Teacher education plays a vital role in providing quality education to trainees and in-service teachers. Information & Communication Technology (ICT) constitutes an essential part of a teacher education programme with the purpose to help in integrating it in teaching, assessment, and professional development. For this to happen, teacher educators must possess knowledge and skills of using ICT devices and applications. Realizing the significance of ICT in teacher education, different committees and commissions in India have stressed ICT integration in teacher education. The National Policy

on Education (1986) and Programme of Action (1992) stressed the need to employ educational technology to improve the quality of education. The National Curriculum Framework (NCF) 2005 position paper on "Teacher Education" Stated that the use of ICT in meaningful ways makes it easy for teachers to create interesting projects, problem-solving situations, and virtual exposures to effective learning conditions. The National Curriculum Framework for Teacher Education (NCFTE) in 2009 recommended that teacher education needs to orient and sensitize the teacher to distinguish between critically useful, developmentally appropriate and the detrimental use of ICT. The

National Council for Teacher Education Regulations (2014) has further taken the initiative to make ICT literacy a compulsory one in pre-service teacher education. Apart from these, the Government of India has implemented numerous schemes, programmes and initiatives such as DIKSHA, NROER, e-Pathshala, e-PG pathshala, PMeVidya, e-Yantra, Olabs, etc. to promote effective integration of ICT in the field of school and teacher education. It is expected that all the stakeholders of school and teacher education need to integrate ICT in teaching, assessment, professional development, and administration.

Review of Related Literature

Research in the field of teacher education has indicated a mixed finding concerning the integration of ICT in TEIs. Mohalik (2020) reported that 20 percent of trainees use digital devices for using PPT in class, create digital learning materials, and provide feedback to students during internships. Lack of infrastructure, competency, poor leadership support and attitude towards ICT are barriers in the integration of ICT indicated by Andoh (2019). Nasreen & Chaudhary (2018) found that teacher educators and trainees perceived a lack of infrastructural facilities for ICT integration in teacher education programmes. Pandey (2018) revealed that the utilization of ICT is very much essential in the theory classes of teacher education. Angadi (2016) reported that the quantity of computers and ICT used in teacher education institutions is less and it is mainly focused on the learning of ICT skills. Aslan & Zhu (2016) indicated that pre-service teachers as well as starting teachers need more training to become competent in the use of ICT in education. Ghavifekr & Rosdy (2015) found that technology-based teaching and learning is more effective in comparison to traditional classrooms in teacher education institutions. Chemwei

& Koech (2014) found that there is a moderate level of integration of ICT in teacher training colleges. Ungar & Iluz (2014) highlighted three integration levels (basic, focused and creative) of ICT integration in teacher training. Goldstein & Shonfeld (2014) Stated that teacher training colleges incorporated a variety of ICT-based learning assignments related to presentation and learning management. Mwalongo (2011) reported that teacher educators use a wide range of ICT tools for teaching, administration, professional development, and personal use.

The above analysis indicated a smaller number of studies in the area of ICT integration in teacher education especially in the State of Assam, India. Hence, the present study "Status of ICT Integration in Teacher Education Institutions of Assam" is relevant. The investigators raised the following research questions:

Research Questions

- What are the ICT facilities and resources available in teacher education institutions?
- How ICT is integrated by teacher education institutes for performing various institutional activities?
- How ICT is integrated by teacher educators and trainees for teaching, assessment, professional development, and during an internship in teaching?
- What are the different issues and challenges in integrating ICT in teacher education institutions?

Objectives

- To study the availability of ICT facilities and resources in teacher education institutions.
- To study the integration of ICT by a teacher education institute for

performing various institutional activities.

- To study the integration of ICT by teacher educators for teaching, assessment, and professional development.
- To study the integration of ICT by the trainees for teaching and learning during the internship programme.
- To find out issues and challenges in integrating ICT in teacher education institutions.

Methodology

A survey method was used to explore the ICT integration in teacher education institutions of Assam, India. The sample consisted of four Teacher Education Institutions (TEI), 20 Teacher

Educators (TE), and 80 Trainees selected randomly from TEIs affiliated to Guwahati University of Assam. The investigator used three self-developed questionnaires for the principals, teacher educators, and student teachers. Each tool consisted of both close-ended and open-ended items. Content validity of all tools was ensured by taking experts comments and suggestions during tool development. The test-retest reliability (.67) was estimated for closed-ended items in all the tools by giving seven days gaps. All these data were collected by personal visits to four TEIs. The collected data were processed and analyzed in MS excel by using frequency, percentage and average and accordingly tables and graphs were prepared as per the objectives of the study. The detailed analysis and interpretation are presented in the following pages.

Analysis and Interpretation

Table-1: Availability of ICT facilities in TEI's

Sl. No.	Digital Devices	Available (in average/%)	Usable (Frequency & %)
1	Desktop	19.25*	77 (100%)
2	Laptop	3.25	8 (61.54%)
3	Projector	75%	3 (100%)
4	Digital Camera	75%	3 (100%)
5	Scanner	1.75	7 (100%)
6	Printer	2.25	9 (100%)
7	Interactive White Board	2.5	10 (100%)
8	Wi-Fi Connection	100%	4 (100%)
9	Smart Classroom	0	0
10	Computer Laboratory	100%	4 (100%)
11	Power Backup	75%	3 (85.71%)
12	Speaker	3.75	15 (100%)
13	Router	75%	3 (100%)
14	Microphone	2.25	9 (100%)
15	Computer Table	19.25	77 (100%)

*Average

The table-1 indicated that all the four TEIs were having a computer laboratory, desktop, laptop, Wi-Fi, etc. and were fully functional. On average, three laptops per TEIs were available,

but all were not functional. 75 percent of TEIs have digital cameras, projectors, scanners, power backup, and routers. No TEI has a smart classroom.

Table-2: Availability of ICT application/services in TEI's

Sl. No.	ICT Applications/Services	Availability (Frequency & %)
1	Institute Website	4 (100%)
2	Official email id	4 (100%)
3	Facebook/Twitter account	3 (75%)
4	Online Library Catalogue	1 (25%)
5	Group email for each class	0 (0%)
6	WhatsApp group for students class wise	3 (75%)

The table-2 revealed that all the four TEIs have institute websites and official email id. Three TEIs have class wise WhatsApp groups for students and

Facebook/Twitter accounts. No TEIs have a group email for each class and only one institute has the facility of an online library catalogue.

Table-3: Use of ICT by TEI's for student-related work

Sl. No.	Name of Administrative works	Usage (Frequency & %)
1	Online application for student admission	3 (75%)
2	Online receipt of payment from students	2 (50%)
3	Group messaging to parents and students	2 (50%)
4	Biometric attendance system for students	4 (100%)
5	Online assessment for students	1 (25%)
6	Online publication of result	4 (100%)
7	Online issue of mark sheet and certificate	4 (100%)
8	Online feedback from students and parents	1 (25%)

It is found from table-3 that all the institutes are using ICT for biometric attendance of students, publication of results and issue of mark sheet and certificate. 50 percent of institutes are using ICT for group messaging to parents and students and for online receipt

of payment from students. Further, 75 percent of institutes are making use of ICT for online applications for admission. Only 25 percent of institutes are utilizing ICT for online assessment and feedback.

Table-4: Use of ICT by TEI's for administration

Sl. No.	Name of Administrative Works	Usage (Frequency & %)
1	Online application for recruitment	2 (50%)
2	Online tender notice for institute work	0
3	Biometric attendance system for teachers	4 (100%)
4	Online submission of performance appraisal report of staff	4 (100%)
5	Online notice to staff and students	3 (75%)
6	Online official record-keeping	1 (25%)
7	Online financial management	1 (25%)
8	Online issue of books in the library	0
9	Online catalogue for library	1 (25%)
10	Using ICT for teaching	4 (100%)
11	Monitoring staff performance via CCTV	2 (50%)

The table-4 revealed that all TEIs are using ICT for biometric attendance of teachers and submission of performance appraisal reports. 75 percent of TEIs use ICT for online notice to staff and students. Further, 50 percent of TEIs employ ICT for application for recruitment, providing e-circular

regarding official matters as well as for monitoring staff performance. No TEIs use ICT for online tender notice for institute work and the online issues of books in libraries. Only 25 percent of TEIs use technology for library catalogue, keeping of official records, and financial management.

Table-5: Use of ICT for teaching & learning by teacher educators

Sl. No.	Items	Always (N & %)	Sometimes (N & %)	Never (N & %)
1	Collect study material	12 (60%)	8 (40%)	0
2	Read e-books/materials	3 (15%)	17 (85%)	0
3	Prepare PPT for teaching	0	20 (100%)	0
4	Use PPT in teaching	0	20 (100%)	0
5	Create digital learning materials (Audio/video)	0	20 (100%)	0
6	Communicate online with students	5 (25%)	15 (75%)	0
7	Use social networks for teaching purpose	3 (15%)	16 (80%)	1 (5%)
8	Use video clips for teaching	0	19 (95%)	1 (5%)
9	Use different online library	0	2 (10%)	18 (90%)

10	Use mobile application (Edmodo/Google class) for teaching	1 (5%)	0	19 (95%)
11	Use group email of class for academic purpose	0	6 (30%)	14 (70%)
12	Use group WhatsApp of class for academic purpose	7 (35%)	12 (60%)	1 (5%)
13	Share online material with students	1 (5%)	18 (90%)	1 (5%)

The table-5 indicated that 60 percent of teacher educators always use ICT for collecting study material from the internet, 35 percent use group WhatsApp of class for academic purposes and 25 percent of teacher educators always communicate online with students. All teacher educators sometimes use ICT for preparing and using PPT for teaching and for creating digital material. 95 percent teacher educators

sometimes use video clips for teaching purposes, 90 percent of educators share online materials with students, 85 percent of educators sometimes use ICT for reading e-books, 80 percent of educators use social networking for teaching. Further, 95 percent and 90 percent of teacher educators never use any mobile applications and different online libraries, respectively.

Table-6: Use of ICT for assessment & evaluation by teacher educators

Sl. No.	Items	Always (N & %)	Sometimes (N & %)	Never (N & %)
1	Provide online assignments	0	13 (65%)	7 (35%)
2	Receive online assignments	0	10 (50%)	10 (50%)
3	Prepare test items	5 (25%)	14 (70%)	1 (5%)
4	Share student's result	2 (10%)	7 (35%)	11 (55%)
5	Portfolio assessment	0	4 (20%)	16 (80%)
6	Conduct online test	0	1 (5%)	19 (95%)
7	Maintain student's record	6 (30%)	14 (70%)	0
8	Provide feedback via online	0	4 (20%)	16 (80%)
9	Blog assessment	0	4 (20%)	16 (80%)

In assessment and evaluation, 30 percent of teacher educators always use ICT for keeping a student's record, 70 percent of teacher educators sometimes use ICT for preparing test items, 65 percent educators sometimes provide

online assignments and 50 percent receive online assignments. Further, 80 percent of educators never use blog assessment, online assessment, and Google Forms.

Table-7: Use of ICT for professional development by teacher educators

Sl. No.	Items	Yes
1	Use of ICT for doing online courses like MOOC/SWAYAM	3 (15%)
2	Member of any online professional group	4 (20%)

3	Share study materials with the professional group	4 (20%)
4	Subscription of online journal	9 (45%)
5	Attending orientation/refresher course	13 (65%)
6	Creation of digital teaching-learning materials	20 (100%)
7	Attend online seminar/workshop	2 (10%)
8	Online interaction with subject experts	2 (10%)
9	Use of ICT for reviewing research	19 (95%)
10	Familiarity with data analysis software (SPSS/Alta Vista)	10 (50%)
11	Use of ICT for skill development in teaching/research	20 (100%)

It is noticed from table-7 that all teacher educators use ICT for skill development in teaching and research and the creation of digital teaching-learning materials. ICT is used by 95 percent of teacher educators for reviewing research. 65 percent of teacher educators attended

orientation and refresher courses on ICT in the last three years; 50 percent of educators were familiar with data analysis software and 45 percent of them have online subscriptions to different journals.

Table-8: Use of ICT by the trainees during the internship

Sl. No.	Items	Yes (F & %)
1	Planning lesson	47 (58.75%)
2	Prepare lesson plan	39 (48.75%)
3	Collecting additional information about the topic	76 (95%)
4	Find learning resources on the internet for teaching	68 (85%)
5	Read online books and other materials	58 (72.5%)
6	Develop audio/video materials as learning resources	36 (45%)
7	Prepare PPT	33 (41.25%)
8	Prepare classroom notes	73 (91.25%)
9	Get an idea about innovative strategies for teaching	10 (12.5%)
10	Assess students in the classroom	7 (8.75%)
11	Provide homework/assignment	6 (7.5%)
12	Provide feedback to students	4 (5%)
13	Refer to online journal for teaching	13 (16.25%)
14	Communicate with peers, student teachers and teacher	79 (98.75%)

The table-8 indicated that 98.75 percent of trainees communicate online with peers and teacher educators. 95 percent student teachers use the internet for collecting reference materials during internship. 91.25 percent of trainees use ICT for preparing classroom notes, 85 percent of student teachers use the

internet for finding learning resources, 72.5 percent of trainees read online books and 58.75 percent of trainees use ICT for planning lessons. 95 percent of trainees did not provide online feedback to students and 92.5 percent of trainees did not provide online assignments/homework. 91.25 percent

of trainees did not use any online assessment technique and 87.5 percent of trainees did not adopt innovative teaching strategies. It can be viewed that although some of the trainees use

ICT in some areas of teaching-learning, the majority of the trainees do not utilize ICT for many important aspects of teaching.

Table-9: Use of applications by the trainees for teaching during the internship

Sl. No	Name of Applications/Websites	Yes (Frequency and %)
1	GeoGebra	0
2	YouTube	78 (97.5%)
3	SlideShare	45 (56.25%)
4	Blog	13(16.25%)
5	WhatsApp	72 (90%)
6	Facebook	33 (41.25%)
7	e-pathshala	16 (20%)
8	Mail	77 (96.25%)
9	Mahara	0
10	Digital repository	0

The table-9 reveals that 97.5 percent of trainees use YouTube and 96.25 percent use email for teaching and learning purposes during internship. Slide share application is used by 56.25 percent, WhatsApp by 90 percent and Facebook by 41.25 percent of trainees during internship. Lower percentages of trainees like 16.25 percent & 20

percent of trainees were using blog & e-Pathshala applications, respectively. It is also seen from the above table that most of the trainees did not use different types of applications and even some of them were not aware of various ICT applications which can be used for teaching-learning purposes.

Table-10: Challenges of integrating ICT in TEI's

Sl. No.	Challenges	Yes (F and %)
1	Lack of interest to use ICT	2 (10%)
2	Poor internet connection	12 (60%)
3	Lack of technical support staff in the institute	12 (60%)
4	Lack of electricity during office hours	1 (5%)
5	Lack of facilities in the classroom	19 (95%)
6	Lack of technological knowledge	12 (60%)
7	Lack of awareness about the use of ICT	11 (55%)
8	Lack of time to prepare teaching through ICT	16 (80%)
9	Non-functional ICT equipment	4 (20%)

Table-10 revealed that more than 80 percent of teacher educators opined that lack of smart classroom facilities and lack of time for preparing teaching through ICT are the main barriers to ICT integration. Further, 60 percent of teacher educators viewed lack of technological knowledge, lack of adequate technical support staff, and poor internet connectivity as hampers in the integration of ICT. 55 percent of teacher educators considered lack of awareness about the use of ICT as one of the issues in ICT integration in TEIs.

Major Findings

- All the teacher education institutions have desktops, laptops, printers, white boards, Wi-Fi connection, and computer laboratory, but 75 percent of TEIs have a projector, a digital camera and power backup and no TEI have smart classrooms for teaching.
 - Seventy-five percent of TEIs use ICT for admission and 50 percent use ICT for online payment of fees and group messaging to students and parents, online application for recruitment, notice to staff and students and monitoring students and staff by CCTV. No TEIs use ICT for inviting tender for work and issuing library books to students and staff.
 - The majority of teacher educators sometimes use ICT for assessment and evaluation, especially in preparing test items, sharing results and keeping students' records.
 - More than 50 percent of teacher educators were found utilizing ICT for professional development like using ICT for skill development in teaching/research, creating digital teaching-learning materials, reviewing research and attending orientation/refresher courses.
- More than 50 percent of trainees use ICT for planning lessons, collecting resource materials, reading e-books, preparing class notes, communicating with peers and students. YouTube, Slide share, WhatsApp, and email during the internship. No trainees use mobile applications, such as GeoGebra, Mahara, Edmodo, etc. which are very useful for teaching-learning purposes.
 - Lack of technological knowledge, lack of support staff, poor internet connection, and unavailability of smart classrooms were the major challenges in the path of effective integration of ICT in TEIs.

Discussion of Result

The findings regarding the availability of ICT facilities revealed that all the four teacher education institutions have functional ICT devices like computer laboratory, desktop, scanner, printer, interactive whiteboard, website, official email, etc. But all TEIs do not have a projector, power backup and smart classrooms. This finding is supported by Andoh (2019) who reported that lack of infrastructure competency, poor leadership support and attitude towards ICT are barriers to the integration of ICT. Further, Angadi (2016) found that the quantity of computers and ICT used in teacher education institutions is less. It is also found that ICT has not been fully integrated into performing different activities related to students, staff, administration, teaching, assessment, and publication of results. However, in terms of biometric attendance system and online submission of staff's performance appraisal report, ICT has been used adequately. Chemwei & Koech (2014) indicated that there is a moderate level of integration of ICT in teacher training colleges. Additionally, Goldstein & Shonfeld (2014) Stated that teacher training colleges incorporated

a variety of ICT-based learning assignments related to presentation and learning management. In terms of teaching, learning and assessment, the majority of the teachers were found sometimes using ICT. More than 50 percent of teacher educators were found utilizing ICT for their Continuous Professional Development. Mwalongo (2011) reported that teacher educators use a wide range of ICT tools for teaching, administration, and professional development. It is also revealed that more than 50 percent of trainees use ICT for preparing classroom notes, finding learning resources, and planning lessons. Moreover, the study indicated poor use of ICT applications by the trainees during the internship. Mohalik (2020) found that trainees use digital devices during the internship in teaching programmes for planning lessons, preparing learning materials, and presenting the lesson. Finally, the study portrayed the lack of relevant devices, technological competency, and staff as a major challenge for effective integration of ICT. But Nasreen & Chaudhary (2018) found that teacher educators and trainees perceived the lack of infrastructural facilities as a barrier for ICT integration.

Educational Implications

The authorities of TEIs must provide relevant devices, applications and technical staff so that ICT can be effectively integrated into different institutional activities as well as teaching-learning. All the teacher educators

must be motivated to develop life-long learning habits by proper utilization of ICT based courses like MOOC, SWAYAM for their professional development. The use of ICT during the internship helps in making the trainees familiar with different ICT applications and services, such as NROER, e-Pathshala, GeoGebra, Mahara, Kahoot, YouTube, Mentimeter, Blog, SlideShare, PMeVidya, SWAYAMPRAVA TV channels, etc. which are useful for teaching-learning purpose. Hence, ICT must be taught rigorously in TEIs, so that all trainees would develop technological pedagogical skills.

Conclusion

Integration of ICT in teaching and training is becoming a new normal. Technology should be utilized to enhance educational practice as well as to create new pedagogical strategies for the improvement of teacher training. Teachers can indeed perform better in ICT only when they practice it during their training. Hence, it needs to be first integrated in the teacher education programme. Unless and until teacher educators demonstrate utilization of ICT in teaching-learning process, it won't be conceivable to set up another generation of educators who will viably utilize the new apparatus for teaching and learning. Therefore, constructive and meaningful integration of ICT in teacher education is inevitable to produce more innovative and creative techno teachers who can effectively teach digital native learners in future.

References

- Andoh, Charles Buabeng. (2019). *Factors that influence teachers' pedagogical use of ICT in secondary education: A case of Ghana*. *Journal of Contemporary Educational Technology*, 10(3), 272-288.
- Angadi, G.R. (2016). *A framework for evaluating the ICT use in teacher education: A case study of the colleges of teacher education in Karnataka*. *International Journal of Research in Social Sciences*, 6(12), 209-222.

- Aslan, A. & Zhu, C. (2016). *Influencing factors and Integration of ICT into teaching practices of pre-service and starting teachers. International Journal of Research in Education and Science*, 2(2), 359-370.
- Chemwei & Koech. (2014). *Assessment of ICT integration into instruction in teacher education institutions in Kenya. International Journal of Advanced Research in Social Science and Humanities*, 3(12), 89-94.
- Ghavifekr, S. & Rosdy, W.A.W. (2015). *Teaching and learning with technology: Effectiveness of ICT integration in Education. International Journal of Research in Education and Science*, 1(2), 175-191.
- Goldstein, Olzan & Shonfeld, Miri. (2014). *ICT Integration in teaching and teacher training by Faculty members in Israeli Colleges of Education. Proceedings of the 25th International Conference of the Society for Information Technology & Teacher Education 2014*. (pp. 2648-2653).
- Mohalik, R. (2020). *Digital Literacy and Its Use by Teacher Trainees at Secondary Level in Odisha. Randwick International of Education and Linguistics Science (RIELS) Journal*. 1(2), pp.226-234. DOI: <https://doi.org/10.47175/rielsj.v1i2.90>
- Mwalongo, Alcuin. (2011). *Teachers' perceptions about ICT for teaching, professional development, administration and personal use. International Journal of Education and Development using Information and Communication Technology*, 7(3), 36-49.
- Nasreen, Nakhat & Chaudhary, Firdaus. (2018). *Perception of pre-service teachers towards ICT integration in teacher education in India. Proceedings of the International Conference on Education Technology Management 2018*. (pp. 11-14). DOI: <https://dl.acm.org/doi/abs/10.1145/3300942.3300948>
- National Education Policy Program of Action (1992)*, Ministry of Human Resource Development, Department of Education Retrieved from http://www.kkhsou.in/main/education/national_policy1992.html
- National Curriculum Framework (2005)*, National Council of Educational Research and Training, Retrieved from <https://ncert.nic.in/pdf/nc-framework/nf2005-english.pdf>
- National Council for Teacher Education (2014)* retrieved from https://ncte.gov.in/WebAdminFiles/RCDownloadMaterial/1_24_12_2019_637127771228874466.pdf
- Pandey, Kavita. (2018). *Study of ICT utilization in theory classes in teacher education in India: Theoretical perspective. American International Journal of Research in Humanities, Arts and Social Sciences*, 19(1), 36-40.
- Ungar, O. & liuz, I. E. (2014). *Levels of ICT Integration among Teacher Educators in Teacher Education Academic Colleges. International Journal of E-learning and Learning Objects*, 10(1), 195-216.