शोध प्रभा ISSN: 0974-8946
Shodha Prabha (UGC CARE Journal) Vol. 47, Issue. 01, No.8: 2022

BLENDING OF ICT: RESTRUCTURING OF TEACHER EDUCATION

Dr. Shamshir Singh Dhillon, Assistant Professor, Department of Education, Central University of Punjab, Bathinda : **drshamshirdhillon123@gmail.com**
Anupama Bharti, M.Ed. student, Department of Education, Central University of Punjab, Bathinda : anupamabharti1997@gmail.com

Abstract
The blending of ICT in our teaching-learning process is a journey that can bring exponential growth in the progress of our nation. Due to the effect of the novel COVID-19, teaching-learning process has shifted from face-to-face to online mode. ICT integration into the curriculum can definitely help in restructuring and reorienting the whole teacher education by optimizing the students' learning outcomes. ICT can help in promoting inclusion by providing room for flexibility that enables sustainable development. ICT competencies allows the teachers to integrate ICT into their teaching-learning process effectively. ICT integration also encourages flexibility and better retention among the students using the multi-media mode. India is fast developing its ICT infrastructure and will enhance its present status from the three levels of ICT integration to five levels of ICT integration i.e. entry level, adoption level, adaptation level, infusion level, and finally, transformational level. NEP-2020 also recommends the promotion of ICT integration by taking various steps like establishment of NETF, NRF and promotion of digital portals like SWAYAM and SWAYAM PRABHA where the teacher educators can upload their digital learning resources for providing quality education to the students residing in the remotest parts of the country through enrolment in the MOOC courses and programmes of e-Pathshala.. All these efforts will undoubtedly help in restructuring and revolutionizing teacher education and the whole nation's fate undoubtedly depends upon revamping of the whole of the system of higher education.
Key Words: *Integration of ICT, competencies and restructuring of teacher education.*

Introduction

Teachers have always been an integral part of our education system since time immemorial in the forms of gurus and our guides, but their conditions and names might have changed with changing eras and periods. Still, their work and compassion for humankind never changed. Time and again, teacher education has also gone through drastic changes-from teacher-centric teaching to a learner-centric education. During 2019, the coronavirus (COVID-19) came into the picture and suddenly, every aspect of our lives underwent a drastic change. Even teacher education couldn't stay the same and shifted from face-to-face offline mode to online mode of teaching and learning. In 2020 itself, after 34 years of gap, our latest education policy which is NEP-2020, came to the surface, making us realize how the learners of the 21st century need to be well versed and equipped with ICT competencies, if we have to keep our educational system intact in face of this threat of COVID- 19 pandemic. Therefore in the present scenario, a need was felt to revamp and remodel our teacher education to prepare 21st century learners with necessary skills and competencies so that they can be at par with the teacher educators across the globe. The skills and competencies of 21st-century learners' are positively correlated with the skills and competencies possessed by their teachers, and now the present era is the era of ICT and digital skills (Ocampo, 2021). ICT is the new hope for remodelling and reorienting the whole teacher education towards transforming our 21stcentury learners.

1.0 . Need of ICT integration

Education is everyone's birth right, and to make it possible, we have to take such steps to make it equitable and accessible for all (Bayles, 2018). Earlier in the Vedic period, education was accessible and affordable for every section of the society irrespective of their caste, colour, or family background. In the Islamic era of the medieval period of education, people took the initiative of opening Madrasas and Maktabs for skill-building and making education accessible for humankind's betterment and proper growth. With advancements and innovations in every field, technology started to grow further and became an integral part of our daily lives. Therefore the need was felt to integrate ICT in our

teaching-learning process as it enhances and optimizes learning outcomes (Srijamdee, 2020). Today, India envisions to become a superpower, and this dream of ours can never be visualised without promoting and integrating ICT competencies within our learners. ICT optimizes learning outcomes and promotes inclusion within and outside the school (Abujaroor, 2022). In the present age of globalization, a learner needs to be a digital native for better adaptability to changes, exponential growth in their professional career, commitment to innovation, and sustainable development (Bagur, Liorence, Maria, & Juan, 2020). There is also a positive correlation between teachers' ICT competence and their level of ICT integration in the teaching-learning process (Hero & Cruz, 2021).

1.1. ICT competencies

For successful integration of ICT there are four types of competencies which are required to be attained by teacher educators. These four competencies are;

(1) **Technological ICT Competencies:** These types of competencies deals with teacher's knowledge and technical training that how they use and maintain ICT equipment and software. These competencies related with the skills to operate modern technologies such as- computer, Internet etc.

(2) **Pedagogical ICT competencies:** These competencies are related with teachers' Instructional practices as well as their knowledge related to curriculum that helps them to develop applications within their disciplines to use ICT for the support of teaching learning process. It includes all issues like student learning outcomes, classroom management, lesson-plan development and implementation as well as student evaluation. It includes knowledge about methods and techniques that can be used in the classroom.

(3) **Didactical ICT Competencies:** These competencies are related with subject knowledge of the teacher that is to be taught. A didactical competency deals with teacher's knowledge about their subject, teaching strategies and methods as well as the ability to apply them in the teaching and learning process.

(4) **Social ICT Competencies:** Social competencies are related to the understanding of teacher regarding social and ethical issues surrounding ICT and apply that understanding in their practice.

1.2. Concept of ICT

In the Vedic period of education, there was no such concept of written scripts. Still, later on, with advancement in the human race, manuscripts were introduced and following that, we got printing machines, and this cycle never stopped but kept on growing. Recently NEP-2020 has provided a prototype for preparing the youth of our country to be innovators and skilled human resources.NEP-2020 has also proposed ABC(Academic bank of credit), which will help students to have the flexibility to complete their degrees from multiple universities and get their credits transferred across universities using a similar credit system. This ABC system will also help students to earn their certificates according to their enrollment level in that particular university. Their precious years will not get wasted even if they drop out in between. In early times there was no technology, but education was being imparted through gurus-the experts in any particular field. Gurus used to teach, and shishyas didn't have much choice to pick the guru or any specific domain. Still, with advancement in time, technology came into our lives and made significant changes. ICT and social networks have become the vital communication tools, specifically for the school going children. Now technology has become progressively important in the lives of students. Thus, they view internet as indispensable part of their daily lives (Bourassa, 2012). Social media tools provide schools children the opportunities to connect, access information and for writing projects and other classroom assignments. In today's global era, the influence of ICT tools on the education system is becoming a strong governing factor. ICT which is mainly used for conveying information has become essential for the students.Now is the time when we need global citizens who are at par with international standards and have an extra edge compared to other people. This edge could be provided by integrating technology into the education throughout the teacher training programmes for longer hours to bring positive changes (Aydin & Zhu, 2015).

ISSN: 0974-8946
Vol. 47, Issue. 01, No.8: 2022

Whatever changes that our NEP-2020 envisions to bring into the reality, could be accelerated exponentially with the help of ICT integration. ICT can also promote our society's inclusion and sustainable growth (Bagur, Liorence, Maria, & Juan, 2020). Teacher education is the backbone of the whole community, and ICT is the future of our nation. Research has shown that ICT integration helps in enhancing the pedagogical skills of maths teachers (Bretscher, 2021). Pre-service teachers who are open-minded in using ICT and think they can do it are better at using it than other pre-service teachers. (Demitrius & Mumcu, 2021).

1.3. Levels of ICT integration in Teaching-Learning

The use of the YouTube to watch the educational videos, easy access to e-books, online notices, learning in virtual classrooms via video conferencing tools such as Google meet, Zoom and Skype and registration of students in virtual classes like Google Classroom, Edmodo and LMS such as MOODLE, BLACKBOARD are some of the major aspects that contribute to the students' academic development. Moreover, the use of ICT tools in any classrooms can be a great source of education which enables to inspire students to obtain knowledge. A new era of digital education has been started after COVID-19 pandemic situation which demands a new role of teacher, pupils and education system. In the era of ICT, it will be very difficult for the India to bridge the digital divide, if concerted efforts are not made to promote ICT in education.

The novel coronavirus has accelerated the pace with which ICT was being promoted and used in our Indian society and helped us shift our teaching-learning from face-to-face mode to online and now even to a blended mode of education (Lo, Han , Tang, & Wong, 2021). Flexibility is the key for enhancing students learning in today's time to make the most out of our potential. The multi-component blended learning mode helps learners use ICT in their daily lives and enhance their productivity by giving flexibility in their study style (Lo, Han , Tang, & Wong, 2021). According to Nicole, (2007) students and teenagers have specially recognized these media platforms to be able to connect and enrich their social lives. The convenience of these ICT tools allows its users to communicate with other people without any limitations of time, place and distance (Schmitt and Lilly 2012). It also provides opportunities for connecting with peers, enhancing learning opportunities, and personal development (Agnew, 2014). Earlier, we have been using the three hierarchical levels of ICT integration in our teaching-learning (basic, focused and creative level) which leaves room for ICT integration and implementing it as an innovative pedagogy in teacher education (Ungar, Orit, & Emma, 2014)

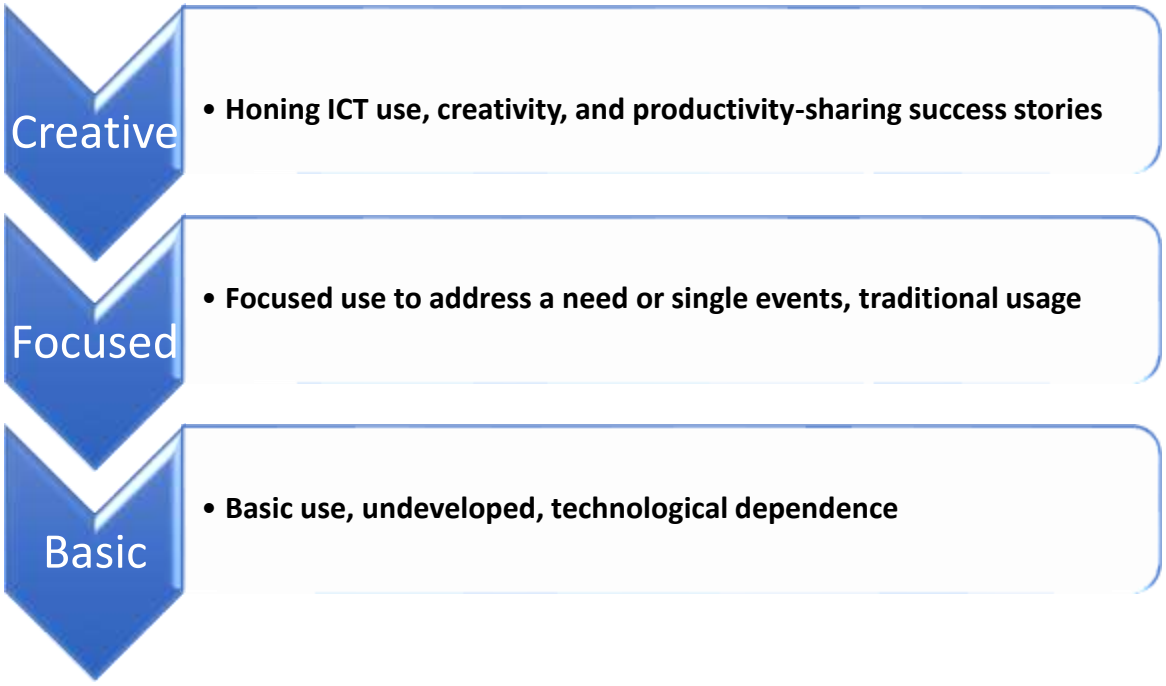

Figure 1: Conceptions of ICT integration among teacher educators at a teacher training college. Source: (Toledo, 2005)

The latest five levels of technology integration that need to be adopted are as follows:
1. Entry level 2. Adoption level 3. Adaptation level 4. Infusion level
5. Transformation level

Entry-level deals with the level of usage of ICT when the teacher starts using ICT tools in their classrooms for the teaching-learning process and delivery of content. At this entry-level, all the decisions regarding how, what and when to use in ICT are being taken by the teachers. Students have limited access to ICT tools, and teachers takes all the significant decisions. This level acquaints the teacher and learners about ICT incorporation in the teaching-learning process.

Adoption level is the further extension of entry level. Even in this level of ICT usage, the teacher remains the centre and directs students regarding when and how to use technological tools inside the classroom. Students' exposure remains limited to a single type of task.

Adaptation level stands at the third level of ICT integration. At this level, students become more independent than the adoption level and don't need procedural instruction from the teachers to use and integrate ICT in their learning process. Learners in this level become independent in exploration.

Infusion level, as the name indicates, occurs when students and teachers become well acquainted with the process and teachers guide and let students decide when, what and how to use ICT for better learning experiences. Students also show abilities to make informed decisions.

The transformation level is the topmost level of ICT integration that helps students customize and make the most out of ICT usage from their teaching-learning. Students have a broader and more conceptual understanding of various ICT tools at this level. Learners in this level are intrinsically motivated to use ICT in unconventional form and make the most out of this. Teachers act as a guide, mentors, and models for better use of technology. At this level, ICT integration helps accomplish higher-order works that wouldn't have been possible or would have been tough to achieve without the aid of technology.

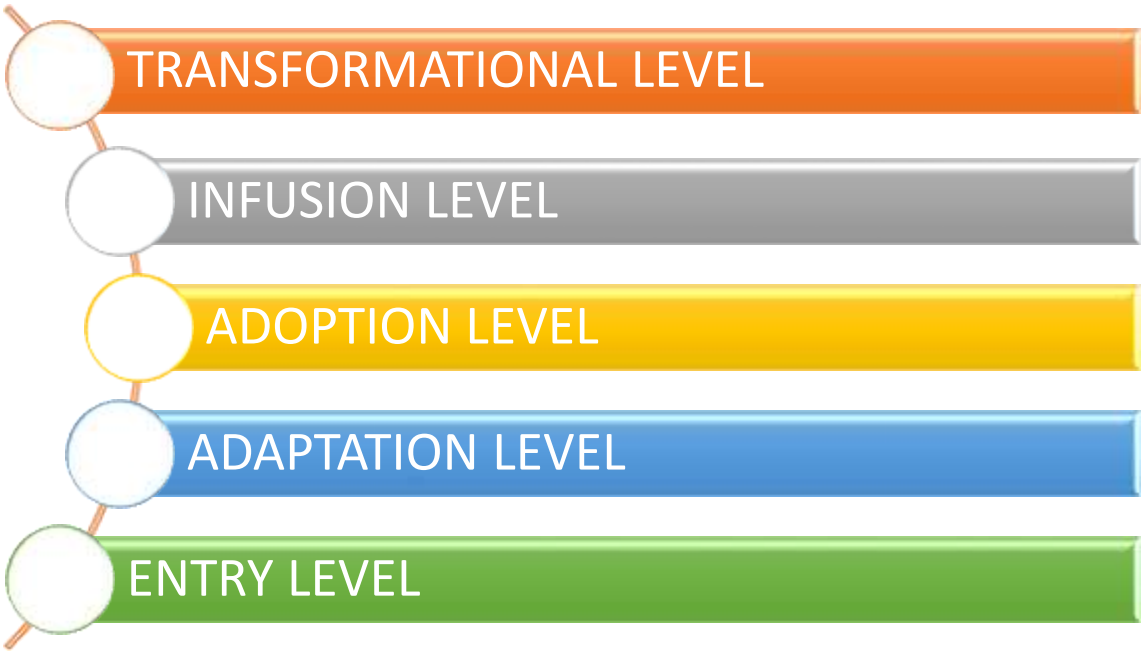

Figure 2: Author's conceptualization

1.4. Implications of NEP-2020 towards integration of ICT in Curriculum

- **NETF**

Today is the era of technology, and in the coming days, the reliance on ICT will increase, and our dependence on it is ever-growing. Taking all of these into consideration, NEP-2020 has proposed the making of "an autonomous body, the National Education Technology Forum (NETF), to provide a platform for the free exchange of ideas on the use of technology to enhance learning assessment, planning, administration, and so on, both for school and higher education" (NEP, 2020).

- **For ensuring Inclusion**

NEP-2020 has planned to develop a variety of softwares for capacity building and giving thrust to research and innovation, which will be made available for all teachers and students. "All such softwares will be accessible to a wide range of users including students in remote areas and divyang students".

- **Promotion of regional languages via ICT**

Teaching-learning e-content will be developed by all states, NCERT, NIOS, CIET, CBSE in all regional languages and uploaded onto the DIKSHA platform for knowledge sharing purposes.

- **Technology-based education platforms**

NEP-2020 recommends to promote technology-based education platforms like DIKSHA and SWAYAM for knowledge sharing among the students across the nation. The teachers can make use of the e-content available on these platforms for better integration into their teaching-learning process.

- **Future perspective of ICT and NRF**

Artificial Intelligence will be the main thrust area is in our future and considering that NEP-2020 has made a foundation called as **National Research Framework** for expanding research efforts in the field of technology.

- **Role of HEI**

"Higher education institutions can play a very active role in conducting research on disruptive technologies and creating initial versions of instructional materials and courses in cutting-edge domains and assessing their impact on specific areas such as professional education".

- **Virtual labs**

Platforms like SWAYAM, DIKSHA, SWAYAM PRABHA are working on creating virtual labs so that we can be future-ready even in the face of any pandemic**.**

Conclusion

The blending of technology in our routine teaching-learning is a journey that has been accelerated during this pandemic. The technology has become progressively important in the lives of the students, thereby integration of technology in education has become an an indispensable part of our daily lives. NEP-2020 has taken significant steps in this direction by strengthening the ICT infrastructure and making an ecosystem in which ICT has a vital role via taking many initiatives like NRF, SWAYAM, SWAYAM PRABHA, and NETF. The blending of ICT in teacher education will not only help in optimizing learning outcomes but will also helps in the sustainable development of the whole nation **.** The blending of ICT in teacher education will help us in restructuring and revamping the whole teacher education and it will bring revolutionary changes in the field of education for the whole nation and in preparing future teacher educators having much needed ICT comptencies to compete with teachers across the countries at the global level.

References

Agnew, T. (2014). Connected or disconnected? The Alberta Teachers' Association, 48 (18).

Abujaroor, S. (2022). Integration through education:Using ICT in education to promote the sicial inclusion of refugees in Germany. *Journal of information systems education, 33*(1), 51-60. https://eric.ed.gov/?redir=http%3a%2f%2fjise.org%2fVolume33%2fn1%2fJISE2022v33n1pp51-60.pdf

Aydin, A., & Zhu, C. (2015). Pre-Service Teachers' Perceptions of ICT Integration in Teacher Education in Turkey. *The Turkish Online Journal of Educational Technology*, *14*(3), 97-110. https://files.eric.ed.gov/fulltext/EJ1067711.pdf

Bagur, F., Liorence, F. B., Maria, A., & Juan, P. (2020). Teaching digital natives to acquire competences for sustainable development. *International journal for sustainability in higher education, 21*(6), 1053-1069. https://eric.ed.gov/?redir=http%3a%2f%2fdx.doi.org%2f10.1108%2fIJSHE-09-2019-0284

Bayles, T., Morrell, & Claudia. (2018). Creating an equitable learning environment. *Florida online journals*, *52*(2), 143-151. https://eric.ed.gov/?q=equitable+learning&pr=on&id=EJ1174611

Bretscher, N. (2021). Challenging assumptions about relationships between mathematics pedagogy and ICT integration: surveying teachers in English secondary schools. *Research in mathematics education*, *23*(2), 142-158. https://www.tandfonline.com/doi/full/10.1080/14794802.2020.1830156

Demitrius, B., & Mumcu, F. (2021). Pre-Service Teachers' Perceptions of ICT and TPACK Competencies. *Acta Educationis Generalis*, *11*(2), 60-82. https://eric.ed.gov/?redir=http%3a%2f%2fdx.doi.org%2f10.2478%2fatd-2021-0013

Dhillon, S.S., & Singh, Mohinder. (2021).Paradigm Shift in Education through ICT. *The Journal of Oriental Research Madras.* ISSN: 0022-3301. Vol. XCII-LXV, 31-40.

Hero, J., & Cruz, A. (2021). Mastering innovations in the lens of information and communication technology(ICT) 21st century Fillipano teachers:A comparison among Thailand, Vietnam and the Phillipines,. *International Journal of Multidisciplinary: Applied Business and Educational Research, 2*(4), 143-151. doi:10.11594

Lo, C.-M., Han , J., Tang, C. C., & Wong, E. S. (2021). Flexible learning with multicomponent blended learning mode for undergraduate chemistry courses in the pandemic of COVID-19. *Interactive technology and smart education*, *18*(2), 175-188. https://www.emerald.com/insight/content/doi/10.1108/ITSE-05-2020-0061/full/html

Nicole E., (2007). The benefits of Face book Fiends; Social Capital and College Students' Use of Online Social Network Sites. Journal of Computer-Mediated Communication.

Ocampo, D. (2021). 21st Pedagogical Competence of Pre-Service Teachers in the New Normal Modalities. *Globus Journal of Progressive Education, 11*(1), 74-79. doi:0000-0002-6501-824X

Policy, N. E. (2020). *National Education Policy.* New Delhi: Ministry of Education. Retrieved from https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

Srijamdee, k., & Pholphirul, P. (2020). Does ICT familarity always help promote educational outcomes?empirical evidence from PISA- Thailand. *Education and information technologies, 25*(4), 2933-2970. doi:0000-0003-3213-4698

Toledo, C. (2005). A Five-Stage Model of Computer Technology Integration Into Teacher Education Curriculum. *5*(2), 177-191. https://citejournal.org/volume-5/issue-2-05/current-practice/a-five-stage-model-of-computer-technology-integration-into-teacher-education-curriculum

Ungar, A., Orit, & Emma, I. (2014). Levels of ICT Integration among Teacher Educators in a Teacher Education Academic College. *Interdisciplinary Journal of E-Learning and Learning Objects, 10*, 195-216. http://www.informingscience.org/Journals/IJELL/Articles

Web links

http://www.ncert.nic.in/publication/journals/pdf_files/jie/jie_nov_2010.pdf
https://studylib.net/doc/11673651/indian-education-journal-of-contents