LEVERAGING INFORMATION AND COMMUNICATION TECHNOLOGY FOR CONTINUOUS LEARNING AND SKILL DEVELOPMENT OF IN-SERVICE TEACHERS

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ABSTRACT
The National Education Policy-2020 envisions an education system to transforming India into an equitable and vibrant knowledge society, by providing high-quality education as well as through Continuous professional development of teachers. The present study aimed to identify the innovations in Continuous professional development of teachers with reference to new National Education Policy 2020 as well as to explore the use of Information and Communication Technology (ICT) resources by in-service teachers for their continuous professional development. Descriptive survey design has been used by taking 30 in-service teachers from different schools of Odisha purposively. Data were collected via an online questionnaire and with a five point rating scale, open ended questionnaire and analyzed through percentage analysis, t' test and by using in-depth analysis. The study revealed the new discoveries for the CPD of teachers by the NEP-2020 as Multimodal workshops, Participation of 50 hours of CPD, Cover latest pedagogies, use of technology platforms and shorter post-B.Ed. certification. The result also revealed that teachers are using ICT resources for overall professional development and for classroom practices. The result also indicates use of ICT resources helping in-service teachers to stay up-to-date with the latest teaching practices, be involved in the world of information, find materials, select, modify, and add content that meets the specific needs of students, facilitate thinking abilities, remain interested in teaching, improve teaching skills, gain motivation and grow professionally.

KEYWORDS: *ICT, Professional development, In-service teachers, CPD*

1.0.   INTRODUCTION
In today's globalized world, teachers face increased difficulties and opportunities than before. In this experience, the professional development of teachers needs to be strengthened at all levels. Professional improvement refers to a range of activities, both formal and informal, that strengthen an individual's skills, knowledge, understanding, and different traits as a teacher. Professional development includes individual development, continuing education, and staff development. Additional knowledge and develop the pedagogical competencies needed for successful teaching and learning. Hence, to give a boost to the professional development of teachers, information and communication technology (ICT) has played an indispensable role. Improvements in technology have changed the usual way of teaching in schools (Ostendorf, Shriberg, & Stolcke, 2005). Currently, many ICT-associated educational devices are being used in classrooms, such as computers, smartphones, laptops, tablets, smart boards, projectors, and specific kinds of multimedia for more engaging and productive teaching and learning. Development, practices at the classroom level, and collaboration with colleagues (Eze, Adu & Ruramayi, 2013).

Keeping view, to the needs of continuous professional development of teachers the investigator was keenly interested to explore the use of ICT resources, especially the Internet, smart phones, forums, and social media for the continuous professional development of in-service teachers. The investigator has gone through several areas which needs to be explored such as i) Whether the teachers are using ICT resources for their professional development, ii) What kind of ICT resources do teachers use for their professional development, iii) How the ICT resources are helping the teachers for proper their overall professional development. The answers to the above questions are going to be potential to monitor and sustain the continuous professional development of in-service teachers and to provide an insight to policymakers, teacher training institutions, and governments for the progressive initiatives in the ICT integration and training of in-service teacher's professional standards looking to the 21st-century requirements. Therefore, the present study is entitled as "**Leveraging Information and Communication Technology for Continuous Learning and Skill Development of In-service Teachers**".

2.0.   OBJECTIVES OF THE STUDY

1) To identify the new innovations in Continuous professional development of teachers with reference to National Education Policy 2020
2) To identify ICT mediated teaching and learning initiatives with reference to new National Education Policy 2020
3) To insight the use of ICT for the continuous professional development of in-service teachers with reference to the overall professional development and practices at classroom level
4) To highlight different type of ICT resources do In-service teachers use for their Continuous professional development

3.0.   HYPOTHESIS OF THE STUDY

Ho1: There exists no significant difference between the male and female in-service teachers use of ICT for their continuous professional development.

4.0.   METHOD OF THE STUDY

For the purpose of identifying the use of ICT for continuous professional development by in-service teachers, the descriptive survey method was used. The researcher has drawn 30 in-service teachers as samples from different schools in Odisha. Purposive sampling was used in this case. A self-designed five-point rating scale was used to collect the requisite data regarding ICT usage. The data were collected using a Google form and analyzed using descriptive statistics (Mean, SD, and percentage) and inferential statistics (t-test).

5.0 RESULT AND DISCUSSION

The results were presented and discussed in the order of objectives of the study.

5.1. Innovations in Continuous professional development of teachers with reference to new National Education Policy 2020

National Education Policy 2020 highlighted several innovative ideas in the field of teacher education for the continuous professional development of in-service teachers. Here, the innovative ideas are outlined by referring to the professional development of in-service teachers.

- Multiple modes of workshops, including in the form of local, regional, state, national, and international as well as online teacher development modules.
- Participation of 50 hours of CPD opportunities every year for their own professional development, driven by their own interests.
- Cover latest pedagogies regarding foundational literacy and numeracy, formative and adaptive assessment of learning outcomes, competency-based learning, and related pedagogies, such as experiential learning, arts-integrated, sports-integrated, and storytelling-based approaches, etc.
- School Principals and school complex leaders will also be expected to participate in 50 hours or more of CPD modules per year, covering leadership and management, as well as content and pedagogy with a focus on preparing and implementing pedagogical plans based on competency-based education.
- Shorter post-B.Ed. certification courses will also be made widely available, to teachers who may wish to move into more specialized areas of teaching, such as the teaching of students with disabilities, or into leadership and management positions in the schooling system, or to move from one stage to another.
- The use of technology platforms such as SWAYAM/DIKSHA for online training of teachers will be encouraged, so that standardized training programmes can be administered to large numbers of teachers within a short span of time.

5.2. ICT mediated teaching and learning with reference to new National Education Policy 2020

The recent rise in epidemics and pandemics necessitates that we are ready with alternative modes of quality education whenever and wherever traditional and in-person modes of education are not possible. In this regard, the National Education Policy 2020 recognizes the importance of leveraging the advantages of technology while acknowledging its potential risks and dangers.NEP 2020 recommends the following initiatives;

- Invest in creation of open, interoperable, evolvable, public digital infrastructure in the education sector that can be used by multiple platforms and point solutions, to solve for India's scale, diversity, complexity and device penetration.
- E-learning platforms such as SWAYAM, DIKSHA, will be extended to provide teachers with a structured, user-friendly, rich set of assistive tools for monitoring progress of learners.
- A digital repository of content including creation of coursework, Learning Games & Simulations, Augmented Reality and Virtual Reality will be developed,.
- Student-appropriate tools like apps, gamification of Indian art and culture, in multiple languages, with clear operating instructions, will also be created for fun based learning
- E-learning platforms such as DIKSHA, SWAYAM and SWAYAMPRABHA will also be leveraged for creating virtual labs so that all students have equal access to quality practical and hands-on experiment-based learning experiences

- Teachers will undergo rigorous training in learner-centric pedagogy and on how to become high-quality online content creators themselves using online teaching platforms and tools
- Proposed National Assessment Centre or PARAKH, School Boards, NTA, and other identified bodies will design and implement assessment frameworks encompassing design of competencies, portfolio, rubrics, standardized assessments, and assessment analytics

5.3. Use of ICT for the continuous professional development of In-service teachers with reference to overall professional development and Practices at classroom level

The present study aims to study the Use of ICT for the continuous professional development of In-service teachers with reference to overall professional development and Practices at classroom level. For this purpose, data have been collected from 30 in-service secondary teachers by using scale for use of ICT for professional development of teachers which is developed by the researchers. After scoring the responses of the participants, the collected data were organized and tabulated. The statement of the scale covers the following dimensions.

a) **Overall professional development:**
   This research explored teachers' perceptions and self-reported use of diverse Information and Communication Technologies (ICT) resources in their ongoing professional development activities.

b) **Practices at classroom level:**
   This researcher investigated the specific ICT resources teachers utilize within their classrooms and explored how these technologies are implemented to enhance the learning experience for students.

Table No 1. Use of ICT for the continuous professional development of In-service teachers with reference to overall professional development.

Sl. No	Statements	SA	A	UD	DA	SD
1	I use ICT resources to expand my experiences for career/promotion purposes	30	53.33	36.66	0	3.33
2	I use ICT resources to improve teaching skills	30	63.33	30	0	3.33
3	I use ICT resources to gain motivation	30	50	40	0	3.33
4	I use ICT resources to grow professionally	30	46.66	43.33	3.33	3.33
5	I use the ICT resources to learn new skills related to my subject	30	70	23.33	0	3.33
6	I use ICT resources to prepare myself for innovation	30	53.33	36.66	3.33	3.33
7	I use ICT resources to share ideas/views with other teachers	30	50	40	0	3.33
8	I use ICT resources to be aware of the latest developments in education	30	66.66	26.66	0	0
9	I use ICT resources to facilitate thinking abilities	30	43.33	43.33	3.33	3.33
10	I use ICT resources to remain interested in teaching	30	53.33	30	0	6.66

Note: the numbers in the table indicate percent.

The above table no-1 indicates use of ICT for the continuous professional development of In-service teachers with reference to overall professional development**.** As presented in above table the findings revealed that 83.33 percent (% of teachers responded SA +A) of in-service teachers perceived that *use of ICT resources to expand their experiences for career/promotion purposes*. While a high majority of the teachers (93.33% of teachers responded SA +A) stated that they *use the ICT resources to learn new skills related to their subject*. The results also indicated that cent per cent of teachers perceived they *use the ICT resources to learn new skills related to my subject* (100% of teachers responded SA +A); *use ICT resources to prepare themselves for innovation* (83.33% of teachers responded SA +A); *use ICT resources to share ideas/views with other teachers* (80% of teachers responded SA +A); a high majority of teachers(96.66% of teachers responded SA +A) stated that *they use ICT resources to be aware of the latest developments in education; they use ICT resources to remain interested in teaching innovation* (83.33% of teachers responded SA +A).

From the above discussion, it can be concluded that majority of teachers are using various ICT resources (e.g. internet, smart phone, social media, computer etc) to expand their experiences for career/promotion purposes, improve teaching skills, gain motivation, grow professionally, learn new skills related to subject, Prepare for innovation, share ideas/views with other teachers, be aware of the latest developments in education, facilitate thinking abilities, remain interested in teaching.

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Table No 2. Use of ICT for the continuous professional development of In-service teachers with reference to Practices at classroom level.

Sl. No	Statements	SA	A	UD	DA	SD
1	I stay up-to-date with the latest teaching practices	53.33	33.33	3.33	3.33	6.66
2	I use ICT resources to be involved in the world of information	63.33	26.66	0	0	10
3	I use the ICT resources to find materials	63.33	26.66	3.33	3.33	3.33
4	I can select, modify, and add content that meets the specific needs of my students	53.33	30	3.33	10	3.33
5	I use ICT resources to learn about a variety of topics	63.33	23.33	6.66	3.33	3.33
6	I use ICT resources to read academic articles from online journals	53.33	36.66	3.33	3.33	3.33
7	I use ICT resources to search for information	66.66	33.33	0	0	0
8	I use ICT resources to find exercises	33.33	40	13.33	10	3.33

Note: the numbers in the table indicate percent.
The above table no-1 indicates use of ICT for the continuous professional development of In-service teachers with reference to practices at classroom level. It is evident from the above table, teachers are *using ICT resources to be involved in the world of information* (90% of teachers responded SA +A). Similarly, majority of the teachers are *using the ICT resources to find materials* (90% of teachers responded SA +A); while 83.33 % teachers believed that they *can select, modify, and add content that meets the specific needs of their students;* they *use ICT resources to learn about a variety of topics*(86.66% of teachers responded SA +A). The findings also reveals that majority of teachers are *using ICT resources to read academic articles from online journals* and to search for information (90% of teachers responded SA +A). In the other hand, 73.33% teachers are *using ICT resources to find exercises.*

Overall, it can be conclude that majority of teachers are using ICT resources in their classroom teaching learning situation. The findings indicates use of ICT resources helping them to stay up-to-date with the latest teaching practices, be involved in the world of information, find materials, select, modify, and add content that meets the specific needs of my students, learn about a variety of topics, read academic articles from online journals, search for information and to find exercises.

5.4. Type of ICT resources do In-service teachers use for their Continuous professional development
The present study aims to study find out the type of ICT resources do In-service teachers use for their Continuous professional development. For this purpose, data have been collected from 30 in-service secondary teachers by using self developed open handed questionnaire.

i) Questions were deal with the teachers' opinion whether they are using ICT resources (the Internet, smart phones, forums, social media etc.) for their professional development. They were given two options such as "Yes" and "No". They were asked to put a tick mark against the appropriate option. The Percentage of their responses has been provided in table no 3.

Table No 3. Teachers' opinion about the use of ICT resources. (N=30)

Sl .No.	Item	Responses	
		Yes	No
1	Do you use ICT resources (the Internet, smart phones, forums, social media etc.) for your professional development?	29 (96.7%)	1 (3.3%)

Table no.3 reveals that majority of teachers (96.7%) are using ICT resources for their professional development. In the other hand only one teacher is not using any of the ICT resources for professional development.
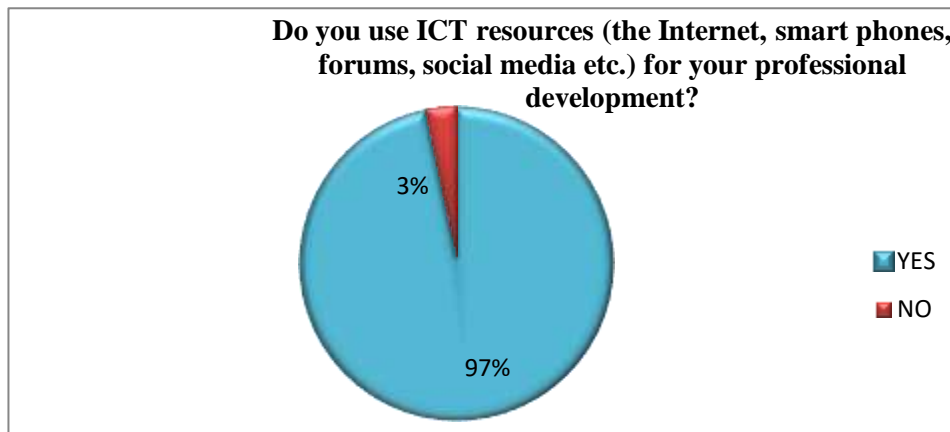
Figure No: 1 Teachers' opinion about the use of ICT resources.

ii) Participants were again asked to mention the type of ICT resources/ platform and how they are using these for their professional development. According to the data, teachers are using various ICT resources for their professional development like YouTube, telegram, blogs, mobile phone, Computer, Projector, Google, OERs, online resources like articles, journals, NISTHA and DIKHYA, Wikis, Blog's, Slides, online assessment tools and Chalklit etc. Some of the teachers mentioned that they are using different ICT resources, for accessing different study materials and gaining additional information regarding teaching profession. While some other mentioned they are using online resources like articles, journals for some up-to-date information for the sake latest changes and innovations, research articles for research work knowledge and some online Govt. initiative web programme like NISTHA and DIKHYA for accomplishment of their in-service training.

Overall it can be said that the use of ICT assist definitely like a co-assistance in order to compete with the progressive society and develop the professional competencies.

5.5. Difference between the male and female in-service teachers use of ICT for their continuous professional development.
In order to find out the Difference between the male and female in-service teachers use of ICT for their continuous professional development, independent t-test has been used. The details of analysis and their interpretations are given below.

Table No 4. Significant difference between the male and female in-service teachers' use of ICT for their continuous professional development.

Gender	N	Mean	SD	SE	p-value	Level of significance
Male	16	79.19	14.59	3.64	.704	Not significant
Female	14	75.29	18.38	4.91		

Table 4 indicates that the value of p' (0.704) is greater than 0.05 and hence, not significant at 0.05 level. So, the null hypothesis, « There exists no significant difference between the male and female in-service teachers use of ICT for their continuous professional development » is retained. Result leads to infer that the use of ICT resources by male and female teachers is not differing significantly.

6.0. MAJOR FINDINGS AND SUGGESTIONS
1) The findings revealed that majority of in-service teachers (83.33%) are using ICT resources to expand their experiences for career/promotion purposes and (93.33%) using the ICT resources to learn new skills related to their subject.
2) It is found that cent per cent of in-service teachers are using the ICT resources to learn new skills related to their subject (100%).
3) Most of the in-service teachers (83.33%) are using ICT resources to prepare themselves for innovation use and (80%) using to share ideas/views with other teachers.
4) High majority of in-service teachers (96.66%) agreed that they use ICT resources to be aware of the latest developments in education and (83.33%) use ICT resources to remain interested in teaching innovation.
5) It is found that (90%) in-service teachers are using ICT resources to be involved in the world of information as well as to find materials.
6) Most of the in-service teachers (83.33%) believed that they can select, modify, and add content that meets the specific needs of their students where some (13.33) showed their inability.

7) The findings revealed that majority of in-service teachers (90%) are using ICT resources to read academic articles from online journals and to search for information

8) In-service teachers are leveraging a wide range of ICT resources for professional development. These include online platforms like YouTube, Telegram, and blogs, alongside mobile devices, computers, projectors, and Google. Additionally, teachers utilize Open Educational Resources (OERs), online articles and journals, government initiatives like NISTHA and DIKHYA, wikis, slides, online assessment tools, and Chalklit.

    Particularly valuable are online resources like articles, journals, and government training programs, which provide teachers with access to current information, research advancements, and professional development opportunities.

9) The use of ICT resources by male and female teachers is not differing significantly.

10) Due to the effect of COVID-19, our institution closed and brought an opportunity for us to connect from all over the world. Teachers are able to explore and widen knowledge by shifting to online classrooms from traditional classrooms. In this crucial time professional development of teachers is the top most requirements by integrating ICT resources.

11) Although, most of the teachers are using ICT resources for their professional development. But we need to make it efficient according to the classroom needs. Looking to the demand of in-service teachers, orientation and workshops are required to be organised for the development of technocratic skills among in-service teachers to use ICT resources in an effective way.

7.0. CONCLUSION
The National Education Policy 2020 (NEP 2020) prioritizes empowering teachers through self-improvement opportunities. These will encompass local, regional, state, national, and even international workshops, along with online modules for continuous professional development.

This focus is crucial in today's rapidly evolving knowledge landscape. Dramatic advancements in science and technology, including big data, machine learning, and artificial intelligence, necessitate a parallel evolution in teacher training. NEP 2020 acknowledges this by emphasizing the integration of demanding technologies alongside the development of multidisciplinary skills across various disciplines, particularly computer science and data science.

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