

Information and Communications Technology (ICT) Integration and Challenges in the Chuzagang Primary School in Sarpang.

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ABSTRACT : The integration of Information and Communication Technology (ICT) in Education has become a global imperative, transforming traditional pedagogical approaches and enhancing learning experiences. This study delves into the current state of ICT integration and the associated benefits and challenges Chuzagang primary school in Sarpang. This study employed a qualitative research approach for data collection techniques to explore the ICT integration landscape in the school. Interviews, class observations, and documentation have provided valuable insights pertaining to the technology adoption. A total of 20 students, 10 teachers and 6 parents participated in the study.

The findings revealed that there are potential benefits of ICT integration as well as various challenges in the implementation of technology-based teaching. These challenges encompass infrastructure limitations, inadequate professional training for teachers, curriculum alignment difficulties, unstable internet connectivity and socio-economic disparities among the students.

Keywords: *Benefits, Challenges, Digital devices, ICT Integration*

I. INTRODUCTION

The integration of Information and Communication Technology (ICT) in education has become a crucial aspect of modern-day learning. In the past few years, there has been a growing trend toward using ICT in primary education. The government has invested a lot of money into this area. Sarpang is one of the districts in Bhutan that has shown a strong commitment to ICT integration in primary education. The government of Bhutan has prioritized the integration of ICT into the country's education systems to enhance the quality of education and equip young children with digital skills for the modern age. But, despite the efforts of the government and other stakeholders, it has been hard to bring effective integration of ICT into school in Sarpang. The reasons could be teachers' incompetency in integrating ICT into their daily teaching, lack of appropriate infrastructure, and accessibility to ICT facilities.

Information and communication technologies (ICT) have become widespread not only in the field of education but also in other domains. Integration of Information, Communication, and Technology (ICT) will assist teachers with the global requirement to replace traditional teaching methods with technology-based teaching and learning tools and facilities (Ghavifekr et al., 2015). The use of ICT in education replaced the way of teaching and learning processes through accessibility, engagement, and interaction. Technology has opened opportunities for students, and teachers to explore and connect with others, regardless of the location. Hence, teachers in schools should have the competencies to use and integrate technology-related strategies into their daily teaching.

1.2 SIGNIFICANCE OF THE STUDY

The wave of digitalization is spreading very fast in many places, and its impacts are evident in education fields as well. In school, using ICT is important to improve learning efficiency and reduce the burden on teachers. Integration of ICT in school is challenging due to the lack of adequate facilities, trained teachers, availability of the facilities, and accessibility to the children. Dorji (2021), reports that the ChiphenRigphel Project offered elementary ICT training to all levels of Bhutanese educators from 2009 to 2013. However, this investigation revealed that several teachers still struggle to integrate ICT competencies into their planned activities. Information and communication technology provides vital tools for global competence and increases the opportunities for students to learn through collaboration at the local, regional, and global levels. Since primary schools seemed to be the initial starting point for young children's intellectual development, they require opportunities to acquire ICT-related skills in their learning processes.

According to Henry (2015), there are many compelling reasons to use ICT in our classrooms, from motivating students and enhancing the learning experience to facilitating planning and the organizational elements of education. Similarly, the Ministry of Education is aiming to provide ICT skills to all children to work and learn collaboratively and to produce productive and globally competent citizens in the future. The integration of ICT in the classrooms is ineffective, teachers and students hardly avail facilities due to time constraints or limited periods. According to the U.S. Department of Education (2016), teachers should be capable of integrating technology into the teaching and learning processes to enhance students' learning environment and academic development of the students". The limited capacity of teachers' ICT knowledge and skills would affect the effective integration of ICT in their teaching and there would be other contributing barriers that teachers are unable to use ICT in their teaching.

1.3 PROBLEM STATEMENT

Pradhan(2001) asserts that ICT has the potential to bring about significant changes and acknowledged as a crucial driver for development (P. 10). Similarly, ICT is a tool that helps the development of intelligence in every aspect of children's lives and the context of learning should be used to create stimulating and motivating learning environments and provide a wide range of experiences to the children. In another scenario as mentioned by Dorji (2021, p. 3), the ministry of education in Bhutan planned various policies for ICT implementation in higher secondary schools in 2010, but could not produce globally competent children. The causes are; the availability of resources, shortage of qualified teachers, the maximum number of students in the classroom, and lack of infrastructure.

1.3 RESEARCH QUESTIONS

To explore the impacts and challenges of ICT integrations in school in Sarpang, the following questions were identified for purpose of this study.

1.4.1 MAIN QUESTION

What are the effects of integrating ICT into student's learning and teacher's teaching in the primary education?

1.4.2 SUB-QUESTIONS

- i. In what ways can the integration of ICT improve the achievements of teaching and learning goals in school?
- ii. What are the advantages and disadvantages of incorporating ICT into primary school education?
- iii. How do teachers view the integration of ICT into their teaching practices?

1.4 OBJECTIVES OF THE STUDY

- ✓ Identify factors that may impact the integration of ICT in schools.
- ✓ Investigate the challenges encountered by teachers and students when integrating ICT into the teaching-learning process.
- ✓ Examine the competencies of teachers, the availability of ICT facilities, and the level of support from school administration to promote successful ICT integration.

II. LITERATURE REVIEW

This part contains different works of scholars that are reviewed and evaluated for this study. The literature review provides the interpretation of existing literature in light of updated developments in the field to help establish the consistency in knowledge and relevancy of existing materials. The literature review aims to provide a comprehensive overview of existing, identify research gaps, and highlight fields for further investigation. It will help the researcher to refine research questions, develop a theoretical framework, and establish the significance of the study.

2.1 BENEFITS OF ICT INTEGRATION IN TEACHING

The merging of technology in the field of education reduces the workload of teachers and creates room for interaction and connectivity among students, teachers, and parents. Information and communication technology can enhance teaching and learning through its dynamic, interactive, and engaging content; and it can provide real opportunities for individualized instruction (Yusuf, 2010, p. 316). In addition, ICTs also provide greater opportunities for teacher-to-teacher and student-to-student communication and collaboration (Mutude, 2017, p.10). ICT is a pivotal tool that supports teaching and learning in all grades in the schools and across all areas of the curriculum.

Technology creates incredible opportunities for young children to discover new ideas and knowledge through connecting with different stakeholders in society. Even though technology has made it easier for teachers to access to effective teaching approaches and strategies, integrating ICT into teaching has made it even more comfortable to make connections with the other side of the world, enhancing classroom management and promoting productive engagement of the students. Mai (2020) stated that it typically involves interactive learning with online support and the use of technology-based tools between the teachers and the learners, and peers. However, in Bhutanese schools, our students are not well advocated to use technology in the right place, even teachers are incompetent to plan an online lesson effectively to rise the curiosity of the children as mentioned by Wangdi et al (2021). In addition Padmanabhan (2020) revealed that the educators can utilize diverse applications or confide in online resources to improve the conventional methods for instructing and to keep the learners progressively more engaged.

a. CHALLENGES OF ICT INTEGRATION

Information and communication technology became prevalent in every aspect of life, without them the progression of learning would be slow and left behind. The students who had access to such opportunities have more exposure and learn better than those deprived of such facilities. Bingimlas (2009) highlighted that the major challenges were a lack of confidence, lack of competence, and lack of access to resources. Subsequently, Dorji (2022) claimed that many teachers have expressed concerns about the availability of and access to resources and facilities for teaching and learning.

Habibu et al (2012) asserted that the material conditions may be the insufficient number of computers and copies of software. The non-material obstacles include teachers' insufficient ICT knowledge and skills, the difficulty of integrating the use of ICT in instruction, and insufficient teacher time. Similarly, Lack of training from the government which makes the teachers clueless on how to integrate ICT properly, lack of appropriate software, makes the teachers use ICT monotonically, lack of competence – lack of operating complex applications, and lack of appropriate material which makes the teachers take their time to make own material (Champa et al, 2019). The similar challenge in the Bhutanese context is mostly slow internet connectivity which drags away teachers' interest in using ICT.

b. TEACHER AND PARENT'S PERCEPTION OF ICT INTEGRATION

Integration of ICT into teaching might be very enriching to some of the teachers and some might view it as a distraction and resistant to the use of technology in their teaching due to lack of experience or training. Furthermore, teachers' use of ICT in the classroom enhances learning and brings about the best in students' capacity for active learning (Abel et al, 2022). The use of ICT in the classroom has opened up new horizons and dramatically expanded its use, which makes resources from all over the world available to students and teachers at the click of a button (Ali, 2018). Access to resources through the internet can facilitate meaningful engagement of students in learning despite the workload of teachers in the school. In addition, Abel et al (2022) highlighted that the teachers worry about a lack of technological training and technical support and the dependability of software and hardware are correlated with their attitudes toward ICT integration.

According to Kanthawongs (2013), Information and Communication Technology (ICTs) have become an important role in people's lives. Students, parents, and teachers should prepare themselves for the future of ICTs advancement. In many countries, for example, Turkey, some researchers describe the role of teachers, in engaging students in primary school activities to Web Enhancement Learning Activities (WELA) in terms of motivation, feedback, and interaction. Subsequently, Maxwell et al. (2021) stated that parents can be effective partners and supporters of classroom activities and student learning, but this often requires clear communication and an understanding of what they believe. Similarly, parents in rural are economically unstable, illiterate and cannot support their children with ICT-associated learning at home.

Baytak et al (2012) revealed that parents had deep concerns and worries regarding the internet, time spent in front of a computer, and computer games, and they were more in favor of having their children use ICT under certain rules and conditions. In addition, they also found that the parents had doubts and concerns regarding the ICT integration delivery of instruction through ICT. Effective integration of technology is the result of many factors, but the most important factor is the teachers' competence and ability to shape instructional technology activities to meet student's needs (Abel et al, 2022). Likewise, teachers in Bhutanese schools are not competent to integrate ICT effectively in their teaching and there are no proper evaluation strategies to assess the ICT integration process.

III. METHODOLOGY

3.1 CHOICE OF PARADIGM

Although there are four paradigms in the research area, this study is based on the constructivist paradigm to investigate and explore the impacts of ICT integration in daily teaching lessons in the school. Honebein (1996) describes the constructivist philosophical paradigm as an approach that asserts that people

construct their understanding and knowledge of the world through experiencing things and reflecting on those experiences. Subsequently posited by Cashman et al. (2008), and Hein (1991), it is based on the analogy or basis that people form or construct much of what they learn through experience. In this paradigm, the source of information depends on the participants' views of the situation.

Constructivism is primarily concerned with qualitative data rather than quantitative data. The researcher who adopts a constructivist approach values close engagement with the perspectives and experiences of participants, striving to establish effective connections and interactions. Individual views influence constructivist research and this is based on qualitative approach.

3.2 RESEARCH DESIGN

The constructivist philosophical paradigm is associated with the qualitative research approach. A phenomenological strategy is applied for identifying the essence of human experiences concerning a phenomenon as described by participants in a study. Adom (2016, p. 5) highlighted that the researcher constructs meanings from the phenomena under study through his own experiences and that of the participants in the study. The qualitative research method was used for this study and employed purposive sampling, open-ended interviewing, and data analysis procedures. Specifically, the grounded theory or constant comparative method (Glaser and Strauss, 1967) was used to analyze the data.

3.3 SAMPLE PARTICIPANTS

The participants in this study were from Chuzagang Primary School and community under Sarpang Dzongkhag as the study focused on ICT integration in primary education. The study involved 20 students (10 boys & 10 girls), and 10 teachers (4 male & 6 female) and 5 parents having better knowledge about information and communication technology and other support services.

3.4 DATA COLLECTION TOOLS

There are a variety of methods of data collection in qualitative research, including observations, textual or visual analysis (e.g. from books or videos), and interviews (individual or group). However, the most common methods used are interviews and focus groups (Gill et al, 2008). The data collection strategy used is determined by the question of the study and by determining which sources of the data will yield the best information with which to answer the questions. Data are raw materials for the study and that requires tools to further interpretation or generation using appropriate processing tools like interviews, observation, and documents.

3.5 VALIDITY AND RELIABILITY

Although the term 'Reliability' is a concept used for testing or evaluating quantitative research, the idea is most often used in all kinds of research (Golafshani, 2003, p. 601) and the concept of validity is described by a wide range of terms in qualitative studies. In this study, reliability, and validity are done through data triangulation; observation of the issue related to research from different areas like interviews, documents, and observation. Peer debriefing is one area to evaluate the reliability and validity of the study and literature backup was used frequently. The interpretations of data are done using a spreadsheet or other software that supports the information.

IV. FINDINGS

The students reported that learning with ICT was effective and helped them better understand classroom topics. Technology also provided additional information and supported them in completing assigned homework on time. However, despite the benefits of technology in fostering concentration and understanding of concepts, students mentioned difficulties with typing and finding effective information from Uniform Resource Locators (URLs). Some students reported difficulties accessing ICT services due to a lack of resources or limited interest stemming from time constraints at school. Other concerns included the unavailability of technology facilities both at school and at home, as well as the extensive syllabus in the prescribed curriculum. The study which involved 20 students, 12 of them revealed that they used their parents' smart phones for learning at home. Additionally, 8 students mentioned that while their parents do not owned smart phones, they still have access to a computer, and make use of smart television services at school for educational purposes. The study's focus group is situated in a rural area, a few economically disadvantaged parents could not afford digital smart amenities for their children. This results in fewer opportunities, as voiced by some of the students.

The ICT integration in teaching is mostly employed by science and mathematics teachers as most of the respondents shared and expressed their satisfaction. The fact is that learning resources were available and accessible online which had good advantages for exploring relevant information related to the subjects. Despite the difficulties of managing gadgets by concerned parents, most of the students had learning groups formed with their subject teachers to communicate with each other. Social media applications such as Messenger, Telegram, WeChat, and Google Classroom served as primary platforms for facilitating educational connections, enabling tasks like homework, reading, and other learning activities to be linked to the respective subject teachers.

The teachers described the positive impacts of ICT integration in teaching through their experiences. They shared that ICT integration enhanced learning, facilitated access to rich information and resources, and enabled interactive and engaging learning experiences. It assisted educators in assessing and communicating with students. Some teachers mentioned that ICT integration was a valuable tool that enhanced their teaching and believed it led to better understanding and retention of content. They emphasized that ICT integration had several advantages in teaching, including making teaching materials more interesting and engaging, simplifying the comprehension of difficult concepts, providing exposure to both teachers and students, and facilitating access to relevant information and resources.

Accordingly a teacher mentioned, "Most of the students are fully motivated in using ICT, as a result their learning is also enhanced to great extent". The integration of technology in teaching boosted learners' academic progress as well as their development in other areas because digital tools provided instant feedback on assignments and quizzes, helping students track their progress and stay motivated to improve their learning. Teachers ensured that ICT integration was properly monitored or evaluated through technology apps and by seeking feedback from students, parents, and colleagues to understand their perceptions and experiences regarding the use of ICT. Some teachers expressed that ICT integration helped students develop critical thinking, creativity, and problem-solving skills, especially when students were encouraged to learn with technology.

Respondents noted that parent involvement in ICT integration enhances collaboration and support among parents, students, and teachers through the use of digital tools and resources. This strategy recognizes the importance of technology in modern education and seeks to ensure that parents play an active role in their children's educational journey. A teacher suggest, "Educating parents through advocacy program and creating common forum among teachers and parents". It reflects a commitment to improving the overall learning experience through effective and efficient communication and collaboration. Parent involvement in ICT integration is seen as a vital component of supporting both students and teachers, contributing to better learning outcomes at school and at home.

Parents also observed that learning had become more enjoyable and practical, indicating that the integration of ICT made education more engaging and relevant for their children. In an interview one of the parent mentioned that ICT integration has positive impact on child learning process as student understand better by using ICT. This positive attitude toward learning was seen as essential for long-term academic success. The majority of respondents noted that their children's use of smart phones to explore information and analyze content demonstrated the versatility of these devices in supporting various learning activities. They believed that teaching children how to use technology responsibly was a critical part of developing digital literacy. Maintaining a balance between technology use and other aspects of life ensured a holistic approach to the children's well-being.

All the respondents expressed concerns about the wide range of apps and websites that were inappropriate for their children. They were worried about the risk of exploitation through unwanted social media programs or activities. Additionally, they felt that excessive use of technology was time-consuming and could make children overly dependent on it, leading them to focus more on games than on traditional learning activities like reading and writing. This excessive attachment to devices could also negatively impact children's behavior and priorities.

Parents and teachers emphasized that proper monitoring and controlling of the content children had access to be crucial for their well-being. They recognized the potential dangers of online interactions and stressed the need for parents and teachers to be aware of children's online activities to ensure their safety. They highlighted the importance of setting limits and encouraging a healthy balance between ICT integration and other activities. Ensuring that children engaged with educational and age-appropriate content was crucial, and parental involvement in guiding and selecting content helped mitigate concerns at home. The challenge of maintaining focus and engagement during educational activities underscored the importance of creating a conducive learning environment both at school and at home.

Parents' concerns reflected a broader societal challenge of managing children's exposure to technology, emphasizing the need for parental guidance, setting boundaries, and promoting a balanced approach to technology use in their lives. Additionally, parents had concerns about ICT integration in children's education, particularly regarding screen time and its potential impact on their health and social development. Another concern was that ICT integration in teaching might replace face-to-face interaction with teachers and peers, potentially impacting their overall learning experience.

Barriers of ICT Integration in the School: All the respondents stated that professional development opportunities were limited or not tailored to the specific needs of the educators. They shared that some teachers were resistant to integrating information and communication technology (ICT) into their teaching methods, either due to a lack of confidence in their technical skills or concerns about the impact on traditional teaching methods. The respondents described that students did not have equal access to technology at home, leading to a

"digital divide." This created disparities in students' ability to complete assignments or project work and participate in online learning. They also stated that schools lacked the necessary technical support to address issues with hardware, software, or network connectivity, hindering the smooth implementation of ICT initiatives. One of the primary challenges was financial constraints, as individual schools did not have an independent budget. This hindered investment in necessary infrastructure, such as computers, high-speed internet, and other technological tools. They expressed that the curriculum was not properly aligned with digital tools and remained more traditional rather than student-centered. In addition, teachers expressed doubts about the effectiveness of using ICT applications in collaboration, independent learning, and self-directed learning in schools.

V. DISCUSSIONS

This study focused on the Information and Communication Technology (ICT) integration into classroom teaching and its challenges. The majority of the students claimed that ICT integration assists in performing different tasks, such as doing assignments, and classroom activities, and planning their learning activities more efficiently. Similarly, a study by Ishaq et al (2020) stated that effective ICT use integrated with teaching and learning practice adds interest, encouragement, and motivation among the students that helped the students to process information in a better way, increases their understanding, and expands their memory. In addition, a study by Nwigbo (2016) claimed that ICT allows students to investigate more thoroughly the real world. They can more readily access information sources outside the classroom and can use tools to analyze and interpret such information. Similarly, Rosdy (2015) mentioned that integration of ICT in a classroom is getting more important as it helps student enhance their collaborative learning skills as well as develop transversal skills that stimulate social skills, problem-solving, self-reliance, responsibility, and the capacity for reflection and initiative.

A study by Raheem et al (2021) revealed that ICT has provided many opportunities for teachers to support learning material for teaching students in classrooms and improved the achievements of students. Similarly, this study indicates that when teachers are proficient in using technology, they created a more conducive learning environment, positively impacting students' academic outcomes. A researcher Henderson (2020) stated that technology provides different opportunities to make learning more fun and enjoyable in terms of teaching the same things in new ways. This study indicated that interactive lessons are made through gamification, taking students on virtual field trips during ICT periods and using other online learning resources.

A study conducted by Sydon (2022) revealed parental support for early exposure as the benefits of technological experience by these children have resulted in numerous benefits, especially in English language learning. Furthermore, this study indicated that most of the parents claimed that technology has a crucial role in educating their children through interactive learning and personalized experiences in the 21st century despite their concerns. In addition, the researchers Vodopivec and Gavriloski (2011) stated that ICT in cooperation and partnership with parents can be further complemented, considering that ICT enables parents to be involved in their children's education faster, more reasonably, and actively, ICT supports more flexible working arrangements, which also impacts the process of cooperation and partnership with parents, and ICT enables more flexible matching of information.

According to the Ruhogo Abel et al. (2022) pointed out that technology-facilitated learning is more effective than the use of traditional and ready-made materials, and the advantages of technology use are supported by learners' increased motivation and engagement. According to this study, the teachers used of digital tools in the classroom encourage communication and cooperation between teachers and students. In addition, a study by Mwendwa (2017), the results showed that ICT was perceived as an important tool in improving performance, collaboration, learning experiences, and learning outcomes. The findings in this study claimed that the availability of ICT in schools, the literacy and informational abilities of teachers, and the attitudes of teachers toward using ICT in the teaching-learning process all had a substantial impact on the use and implementation of ICT in teaching.

VI. RECOOMENDATIONS

The following are recommended based on the findings of this study to integrate Information and Communication Technology (ICT) into the teaching and learning process in primary school for better academic performance of the students.

- ✓ In this 21st-century learning environment, the successful integration of ICT in teaching and learning has been established. To make teaching lifelong learning, ICT tools usage should be promoted in every subject.
- ✓ Teachers should be provided with timely professional development or training on emerging technologies and provide sufficient ICT resources for the schools.
- ✓ To improve ICT services, policymakers in the Ministry of Education and Dzongkhag level need to provide high-speed and reliable internet and standard ICT labs with sufficient computers.

✓ Finally, for future researchers to support and ensure the reliability of the conclusion obtained from this study, a similar study may be carried out with a larger sample from different levels of the schools. The opinions of students and parents toward the integration of ICT in the classroom need to be further investigated.

VII. CONCLUSION

The purposes of this study were to examine the effective integration of Information and Communication Technology (ICT) and find out the good practices towards the use of technology and its challenges in the teaching and learning process in Chuzagang Primary Schools of Sarpang Dzongkhag. The study utilized qualitative methodologies and for that 35 participants took part in interviews including students, teachers, parents, and administrator.

The integration of ICT by teachers was essential to the teaching and learning process, however, how a teacher perceives and used ICT in their everyday teaching was entirely dependent upon them. The most important ones are teacher competency, the ability to incorporate technological resources into the learning environment, and a comprehensive technology curriculum. The use of ICT tools in education is significantly influenced by teachers' professional competency and perceptions of ICT benefits. The effective integration of ICT depends on the accessibility and availability of ICT facilities in school and at home. The parents' support was an essential factor for the effective integration of ICT into the teaching and learning environment and it has a greater impact on the academic achievement of the children.

Despite the numerous advantages of technology in teaching, parents, teachers, and principals are concerned about screen time, diversion of attention, and unawareness of digital or cyber security by the users/students. The ability of teachers to deploy ICT skills, time constraints, and bulky syllabi are hindered the effectiveness of ICT integration in teaching. On the other hand, teacher respondents recommended timely professional development program is required to improve their ICT skills and a computer in every class for effective integration of ICT into teaching. The proper school-level ICT policy and guideline was essential in aligning with the policy of the Ministry of Education and Skill Development for implementing ICT tools in the school across the subjects.

DEFINATION OF TERMS

1. Dzongkhag – District
2. Sarpang – name of district

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