

Enhancement of Information and Communication Technology (ICT) In Teaching Pre-Elementary

RACHELLE B. ALMODIEL¹, ROMA KIER B. DUNGALA², MARISSA B. TINONG³

¹ Balaoa Elementary School, Tadian, Mt. Province, Philippines

² Balili Elementary School, La Trinidad, Benguet

³ Camanpaguey Integrated School, Cabitin, Mankayan, Benguet

Abstract- This study aimed to determine the enhancement of information and communication technology (ICT) in teaching pre-elementary grade level in the province of Benguet and Baguio City. It sought to find out the level of agreement of the use of ICT in teaching in the pre-elementary, the degree of agreement of teachers on ICT use for performance purposes in the pre-elementary, and the degree of seriousness of the problems encountered in impact of ICT on teaching in the pre-elementary. A total of one hundred eighteen (118) pre-elementary teachers from the two municipalities were the respondents in this study. Based the descriptive method used in this study, the following findings were drawn from the study: the pre-elementary teachers agreed on the level of agreement of the use of ICT in teaching in the pre-elementary, the degree of agreement of teachers on ICT use for performance purposes in the pre-elementary were much used, and the degree of seriousness of the problems encountered in the impact of ICT on teaching in the pre-elementary were much serious. From the findings of the study the following conclusions were drawn: The level of agreement of the use of Information Communication and Technology (ICT) in teaching in the pre-elementary teachers were used by the teachers all the time due to its integrated in the curriculum in the basic education because it useful in helping for problem solving; the respondents' level of agreement regarding teachers' use of ICT for performance purposes in pre-elementary education aligns with the reinforcement of learning skills through the repetition of examples; the degree of seriousness of the problems encountered in impact of ICT in the pre-elementary teachers encountered a serious problem due to the barriers that encountered in the different school.

Indexed Terms- Communication, Feedback Assessment, Technical, Information Transformation, Manipulation, Reinforcement

I. INTRODUCTION

In an era marked by rapid change, acquiring a solid foundation in basic education is crucial for individuals to effectively access and utilize information. This includes integrating Information and Communication Technologies (ICTs) into classroom instruction, especially in teaching Science. As educational technologies and innovative learning approaches continue to evolve, teachers are expected to embrace and incorporate dynamic and engaging learning environments. While many educators recognize the educational benefits of ICT integration, a significant portion still choose to employ traditional, teacher-centered methods due to inadequate and underutilized school policies related to ICT planning, support, and training (Hildevan & Jo Tondeur, 2007) as cited by Josol, et al., (2023).

As cited by Bhasin, (2012) over the past three decades, governments and education systems around the world have regarded the use of information and communications technologies (ICTs) as an important issue for improving the effectiveness of teaching and learning (Plump, Anderson, Law, & Qualex, 2009). As more and more technologies, such as net books, interactive whiteboards, smart phones and digital video recorders, have become more available and affordable, coupled with the rapid expansion of computer networking capability in educational system, there have been continued research efforts in investigating how teachers can use ICT to facilitate student learning.

The present society is increasingly being called Information Society, due to the way it has rapidly transformed in terms of economic, political and cultural society due to the onset of ICT. It is important to study the impact and readiness of developing nations to keep abreast with these technological changes in the education system. Incorporation of ICT in core curriculum helps meet the individual learning needs of the children in attractive and fun way while promoting independence and access to a wide range of information (Kaindio & Wagithunu, 2014).

In South Africa has consistently galvanized efforts and resources towards achieving a paperless classroom, to provide learners with better and limitless learning opportunities, including engaged learning environments. This is because ICT has the potential to contribute to improving learner abilities to learn across disciplines and fields. As such, South Africa's ICT mission is included in the country's National Development Plan 2030 (Mjwara, 2017). In 2003, the Department of Education (DoE), cognizant of ICT's advantages for learners, for the first time committed itself to ensure that every learner in South Africa has access to ICT resources and is technologically literate by 2013 (DoE, 2003). This commitment provided the basis for multiple engagements to achieve ICT integration across South Africa.

In India teachers ranging from a primary teacher to a college professor, have been utilizing the potential of technology and integrating it in their classroom to make education reach a large number of learners. Here are some of the best examples by the Indian teachers using technology to overcome the challenges they faced in the journey of providing education to their students. These possibilities show the potential ICT tools and platforms hold in transforming the way education is perceived in the country (Sharma, 2021).

Thailand's also were impressive progress in economic, digital, and educational development demonstrates its potential for continued growth and success. The government's commitment to infrastructure development, digital inclusion, and education reform has laid a strong foundation for future progress, creating an environment that fosters innovation and opportunity. As the country continues to navigate the challenges of the modern era, there are still areas of

focus, particularly in the integration and use of technology to address educational challenges. This report delves deeper into these key issues, analyzing the opportunities and challenges associated with education technology and providing recommendations for how Thailand can continue to build on its progress to achieve even greater success in the years to come (Dipendra, 2023).

In the Philippines Fatefully, the "Kindergarten Education Act", passed in 2011, enacted a mandatory pre-elementary year of kindergarten education, while the "2013 Basic Education Act", extended the elementary and secondary education cycle from 10 to 12 years. It lengthened basic secondary schooling adding a two-year senior high school program which offers academics and technical vocational courses. General and basic subjects were also incorporated to include basic science and technology, engineering, mathematics, accountancy, business and management, humanities and social sciences, and general academic courses such as technical-vocational-livelihood, arts and design, and sports (Crisolo, 2018).

As a nation's ability to adopt new technologies is paramount, it is a building block to achieve advancement and prosperity in all aspects. As reported by National Competitiveness Council Philippines, the Philippines climbed two notch from 74th to 76th out of the 143 economies assessed by the World Economic Forum (WEFO) for the Global Information Technology Report 2015, as the country continued to show improvements in terms of leveraging the benefits of information and communications technologies (ICT). Administering agencies of the Philippine Education System have a vision of creating an ICT-enabled educational system that transforms students into dynamic life-long learners and values-centered, productive and responsible citizens. (Perez, 2016) The Department of Education, one of the largest government agencies had the biggest challenge in keeping the pace and innovations in delivering quality education in this quickly changing world. According to DepEd's Bureau of Curriculum Development Dir. Jocelyn DR. Andaya, "ICT is the first step to enhancing the quality of education in the Philippines." As such, the department had created its DepEd Computerization Programme (DCP) to provide schools with computer packages and IT equipment.

The Department also developed a Learning Resources (LR) portal to provide digitized educational materials with more than 4,000 learning resources available online (Crisolo, 2018).

Despite of appealing visions and endeavors initiated by public and private entities for the country to take advantage with technology, the status of ICT in the Philippines is still characterized with some identified barriers. Dotong, et al., (2016) as cited by (Crisolo, 2018), identified barriers in an effective utilization of ICT in the country, these are inadequate financial support and infrastructure, human capital, management support, as well as behavioral and environmental aspects. The country's geographical location is another factor to consider.

The status of ICT in the Philippines is still characterized with some identified barriers. Dotong, et al., (2016), identified barriers in an effective utilization of ICT in the country, these are inadequate financial support and infrastructure, human capital, management support, as well as behavioral and environmental aspects. The country's geographical location is another factor to consider.

According to UNESCO (2011), the basic requirement for education in the 21st century is to prepare learners for participation in a knowledge-based economy. Technologies can improve the teaching/learning process by enhancing the quality of learning, transforming conventional delivery systems, sustaining lifelong learning and improving institutional management.

Teachers reported that low technical support and a lack of knowledge about software and online sites that can support instructional activities were among major issues faced by pre-school teachers in Malaysia regarding the employment of ICT in the classroom (Kamaruddin, 2017). Meanwhile, Hasan and Sajid's (2013) research showed that a lack of self-confidence was another barrier that many teachers faced in addition to a lack of knowledge related to how to benefit tools of technology for educational interactions. Teachers' perceptions and motivation towards the integration of information and communication tools in learning were also two other major issues that were considered as they affected the

successful application of technology in the classroom (Qasem and Viswanathappa, 2016).

Student education has evolved with the passage of time, and Information and Communication Technology (ICT) has revolutionized the education scenario with the potential to greatly benefit student learning and narrow the achievement gap. The objective of this study stems from the current education environment which is very dynamic due to the way technology is influencing teaching and learning in kindergarten. Children born today have access to technology from the time of birth. The question is not whether ICT should be incorporated into the kindergarten classroom, but rather in what ways can kindergarten educators and the administration be supported with the changes in the digital environment to benefit of the future generation (Kayode & Olaronke, 2014).

Furthermore, the use of ICT has been associated with innovative work, project work, student centered teaching, and student participation. This focus fits well with new pedagogical ideologies and reforms, but less well with assessments, activities, and national tests that are rewarded in terms of accountability regimes. Teachers are therefore faced with a dilemma. The innovative use of ICT is in line with pedagogical ideologies but is unsuitable for national tests, which raises the issue of how this dilemma is expressed in teachers' strategies and reasoning in regard to their practice (Almas and Krumsvik, 2008).

Research gap were the challenges experienced by some schools in the process of ICT integration have included intermittent Internet connectivity and the lack of appropriate administrative support, with varying implications for the classroom. Besides, inadequate technical support to maintain ICT equipment remains a huge challenge in South African primary schools. These challenges are considered by Ismail et al. (2020) as common in developing countries. In this regard, Mirzajani et al. (2016) argued that challenges related to insufficient technical support in terms of ICT integration in the classroom are not unique to South African schools. In their view, these challenges are common but resolvable when schools and the administration work together closely to

identify and resolve existing challenges and provide relevant pieces of advice.

In relation to the research gap of the study were issue frequently encountered by teacher-researchers in pre-elementary education is the underwhelming performance of learners. Several studies have highlighted that integrating Information and Communication Technology (ICT) into classroom instruction can improve learners' achievement levels. Consequently, these researchers were motivated to investigate the efficacy of this approach on pre-elementary grade level. And to identify the obstacles hindering the effective incorporation of ICT in teaching practices. While various research endeavors have explored the problems, issues, challenges, and barriers associated with enhancement of ICT into teaching, the present investigation focuses specifically on the experiences of pre-elementary teachers at the province of Benguet and Baguio City, Philippines.

The researchers noticed that many studies on enhancing ICT in teaching for pre-elementary grades were outdated, some dating back five years. This lack of recent research highlighted a gap in the current understanding and necessitated the need for new research to address this issue.

II. REVIEW OF RELATED LITERATURE

Learning theories are utilized in the creation of instructional environments. These theories were developed in a time when learning was not impacted through digital technology. Over the last twenty years, digital technology has reorganized how we live, how we communicate, and how we learn. Learning needs and theories that describe learning principles and processes should be reflective of underlying social environments. From the point of view information and communication technology there were three learning theories that have been often utilized in the creation of instructional environments: behaviourism, cognitivism, and theory constructivism. New learning theory is connectivism. Digital technology has been developed over the past 30 years (Mechlova, and Malcik, n.d.).

Cognitive learning theories are concerned with processes which occur inside the brain and nervous

system as a person learns. They share the idea that people actively process information and learning takes place through the efforts of the learner. Internal mental processes include inputting, organizing, storing, retrieving, and finding relationships between information. New information is linked to old ones, schema and scripts. All the various cognitive approaches emphasise how information is processed. There were some very early efforts to organize cognitive theories in the late 1900's, but these were usurped by the behaviorist work being done at that time. It was not until the years after World War II that cognitive theories began to find their strength.

Constructivistic learning theory is a meta-concept. It is not just another way of knowing, but a way of thinking about knowing. It is a theory of communication and suggests that each listener or reader will potentially use the content and process of the communication in different ways. There are numerous constructivist learning theories, and the common core that unites them is that learning is an active process, unique to the individual, and consists of constructing conceptual relationships and meaning from information and experiences already in the learner's repertoire (Mechlova, and Malcik, n.d.).

Social constructivism was the theory of Vygotsky (1978) in the late 1970's. Vygotsky's point of view was that acquisition and participation were synergistic strategies in learning situations. Aspects of participation involved teaching in contexts that could be meaningful to students based on their personal and social history, negotiating, class discussions, small group collaborative learning with projects and tasks, and valuing meaningful activity over correct answers. Social constructivism emphasizes that learning takes place through interactions with other students, teachers, and the world-at-large.

- Technological Pedagogical Content Knowledge (TPACK)

The studies above highlight the need for educators to have the required understanding of integrating ICT effectively with students learning in terms of content knowledge and pedagogy to enhance student learning. Charalambidis (2014) raised a question regarding how the world would change twenty years from now for a student joining kindergarten this year. The research

underlined the need for the education system to be pragmatic and create learning opportunities to equip the students for the future scenarios wherein technology would play a big role. Integrating technology with instruction is complex and teachers find it difficult to fit technology into their teaching, often compromising on the effectiveness of the learning experience.

- **ICT Improving Education Environment**

ICT presents a totally new learning condition for understudies, therefore requiring an alternate range of abilities to be effective. Basic reasoning, examination, and assessment abilities are developing in significance as understudies have expanding volumes of data from an assortment of sources to figure out (New Media Consortium, 2007). ICT is changing procedures of educating and learning by adding components of essentialness to learning situations including virtual conditions for the reason. ICT is a conceivably amazing asset for offering instructive chances. It is troublesome and perhaps difficult to envision future learning conditions that are not upheld, somehow, by Information and Communication Technologies (ICT)

- **ICT Improving the Standard and Openness of Training**

ICT expands the adaptability of conveyance of instruction with the goal that students can get to information whenever and from anyplace. It can impact the manner in which understudies are educated and how they learn as now the procedures are student driven and not by educators. This thusly would better set up the students for deep rooted learning just as to improve the nature of learning. Working together with geological adaptability, innovation encouraged instructive projects likewise evacuates a large number of the fleeting requirements that face students with uncommon necessities (Moore and Kearsley 1996) as cited by Sharma, 2020. Understudies are beginning to welcome the capacity to embrace instruction anyplace, whenever and wherever.

- **ICT in Education – the Philippines**

The Philippine Government has shown serious commitment to ICT in education by announcing a series of initiatives to apply ICT in teaching and

learning. These were aligned to the Millennium Development Goals and the Education For All movements. They have provided a global policy environment for the directions and nature of interventions towards the achievement of improved access to and quality of basic education. Other key policy documents have identified the need for ICT reform within the education sector and these have resulted in more prioritising from regions, schools and teachers regarding the incorporation of ICT into the education system. It is within this context of policy initiatives that this Five-Year ICT Strategic Plan has been developed.

- **The Current Situation**

Current ICT integration in education remains a large task. For example, student-computer ratios and teacher-computer ratios can be improved. The education system as a whole lacks infrastructure for connectivity and access to technologies. While most of the teacher training institutions (TEIs) have incorporated computer courses into their curriculum as a requirement for graduation, computer literacy is not a requirement for teacher certification/licensure. Partly due to this reason, in-service training is generally limited to basic computer literacy. Therefore, there is a need for more training on integrating ICT into the curriculum. Fortunately, more government funds are being channeled into ICT for education. Private sector and foreign donors are increasing their support for this agenda. There is a need to consolidate these efforts and help to ensure that the Philippines will realize its ICT4E goals.

- **Competency Standards and Professional Development**

In order to realize this ICT4E masterplan, ICT competency standards for teachers, education managers, school officials and non-teaching personnel/administrative staff shall be developed and adopted. A Competency Standards “is a document that specifies in a structured format how people should perform a job or work role. Organizations use competency standards. ... Competency standards attempt to capture the various dimensions that, when taken together, account for 'competent' performance.” It is envisaged that this Strategic Plan will bring all schools, teachers, Educational Managers, School Administrators as well as Non-Teaching

Personnel/Administrative Personnels to certain threshold levels of ICT provision and skills.

- DepED Computerization Program

Beginning 1996, the Department of Education has embarked upon an undertaking that would provide computers to all public secondary schools in the country. Supported by the DepED's line budget (110 million pesos annually) as well as infusions from the Governments of Japan and the Republic of Korea, the DepED Computerization Program not only includes computerization and connectivity but also teacher professional development, technical training, content development, and strategic planning. FIT-ED (2005) states that the program has succeeded by dramatically increasing computer penetration in public secondary schools. Last year's estimate was 60 to 75 percent. However, the average computer to student ratio is still quite low. For 2007 onwards, the Department will jumpstart this initiative among public elementary schools (Flor, 2007).

- Significance of the Study

The study will be a great beneficial to school administrator as the school leader who will designate the curriculum, the teachers as the main point of the result of the study, learners who are the receiver of the knowledge that will be enhance by the teachers during classroom interaction, the parents who are the second parent of the learners who review the subject matter that are being taught to them, and the future researchers who will continue to research on the importance of ICT in teaching and learning in elementary grade level.

To the Researchers. The research findings can bring new insight on how to enhance ICT and be updated to the different platforms that are used in teaching and learning to be more skilled.

To the Teachers. The study may serve as an evaluation on the functionality of enhancement and integration of ICT in teaching and learning.

To the administrators. The findings of this study will point out factors needed to improve in implementing the ICT platforms used in teaching and learning.

To the learners. Who are the beneficiaries of the enhancement of ICT in learning in the pre-elementary. That will be a great help to them.

To future researchers. This study will provide baseline data information for future researchers, and other sectors of society specially whose subject is on enhancement, integration, utilization in other aspects of DepEd curriculum.

- Statement of the Problem

The study aims to assess the enhancement of information and communication technology (ICT) in teaching pre-elementary.

The research aims to answer the following research questions as guided in the study:

1. What is the level of agreement of the use of ICT in teaching in the pre-elementary?
2. What is the degree of agreement of teachers on ICT use for performance purposes in the pre-elementary?
3. What is the degree of seriousness of the problems encountered in impact of ICT on teaching in the pre-elementary?

- Assumptions

The following assumptions of the study were tested.

1. The level of agreement of the use of ICT in teaching in the pre-elementary is Agree.
2. The moderately use on the degree of agreement of teachers on ICT use for performance purposes in the pre-elementary.
3. The degree of seriousness of the problems encountered in impact of ICT on
4. teaching in the pre-elementary is moderately serious.

- Scope and Delimitation of the Study

This study was conducted within the province of Benguet and Baguio City, Philippines for academic year 2023-2024. Were the respondents are designated.

- Definition of Terms

The researcher has defined the following terms used in the study operationally and conceptually, for better understanding of the work.

Functional Skills. are the core English, mathematics and information and communication technology (ICT) skills people need to solve problems in their work and private lives. The study of these fundamental courses in real-life contexts can allow you to apply them to practical situations.

Computer Hardware. is a collective term used to describe any of the physical components of an analog or digital computer.

Internet. global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols.

Information Communication Technology (ICT). is a broader term for Information Technology (IT), which refers to all communication technologies, including the internet, wireless networks, cell phones, computers, software, middleware, video-conferencing, social networking, and other media applications and services enabling users to access, retrieve, store, transmit, and manipulate information in a digital form.

Learning Process. A process that people pass through to acquire new knowledge and skills and ultimately influence their attitudes, decisions and actions.

Research Design. the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data.

Respondents. is a person who gives an answer. For example, on some Monday mornings, your teacher might feel like she is talking to the walls although she asks questions, none of the sleepy students are willing respondents.

Computer Software. Software is a set of instructions, data or programs used to operate computers and execute specific tasks

Teachers. is a *teaching professional who is meant to help the students to gain knowledge, competence, and virtue.*

III. METHODOLOGY

This chapter emphasizes the research design and methodology that was employed in the study, the research instruments and the statistical devices and procedures that was utilized, to arrive at reliable findings.

- Research Design

In this study, utilized the descriptive research aims to accurately and systematically describe a population, situation or phenomenon. It can answer what, where, when and how questions, but not why questions (Combes, 2023). Research designs in the quantitative realm outline how data will be collected and analyzed with methods like experiments and surveys. Qualitative methods complement quantitative research by focusing on non-numerical data, adding depth to understanding. Data collection methods can be qualitative or quantitative, depending on research goals. Researchers often use a combination of both approaches to gain a comprehensive understanding of phenomena. Quantitative research involves analyzing and gathering numerical data to uncover trends, calculate averages, evaluate relationships, and derive overarching insights. It's used in various fields, including the natural and social sciences. Quantitative data analysis employs statistical techniques for processing and interpreting numeric data. A quantitative approach was employed to gather and analyze data from all participants. The researchers devised a questionnaire, which was finalized before being administered to the designated respondents. Specific sections of the questionnaire were tailored to address research objectives pertaining to the improvement of ICT integration for student learning and the key components of effective ICT integration in public elementary schools in Benguet province and Baguio City. Subsequently, the questionnaire was distributed to collect data from the respondents.

As such, the questionnaire was the main tool in gathering data needed in the study. The data gathered from the respondents was treated with descriptive and inferential statistics.

• **Locale and Population of the Study**

This study was conducted within the province of Benguet and Baguio City during the academic year 2023-2024.

The study involved public primary teachers as respondents that was randomly chosen via convenience sampling for the level of agreement of the use of ICT in teaching in the pre-elementary teachers, degree of agreement of the learners on ICT use for performance purposes in the pre-elementary teachers, and degree of seriousness of the problems encountered in impact ICT on the pre-elementary teachers

Table A
Distribution of Respondents

Name of School	No. of Respondents
1. Balawa Elementary School	4
2. Balili Elementary School	15
3. Baguio Central School	50
4. Camanpaguey Integrated School	12
5. Tadian Central School	16
6. Yagyagan Elementary School	12
7. CCS	9
Total	118

• **Data Gathering Tool**

The researchers gathered the data using the questionnaire enclosed with a letter addressed to the respondents. It focused on the enhancement of ICT in teaching in the pre-elementary. The primary instrument utilized in this study was a checklist questions designed to assess the frequency of ICT utilization and enhancement for improved learning performance within their respective subject areas.

• **Treatment of the Data**

For the respondents to understand the direction and accomplish the items there in; the researchers used the three-point scale to determine.

The data gathered was subjected to the statistical treatment of weighted mean, and ranking. The responses to the items in the questionnaire will be

quantified by the weighted mean. The ranking was used to arrange the items from the highest to the lowest.

The weighted mean was used to determine the weighted mean of responses. The formula used was (Subong, 2006).

$$WM = \frac{\sum fn}{N}$$

Where: WM= weighted mean
 \sum = summation
 f = frequency
 n= nominal value

The results of the computation were analyzed and interpreted.

The level of agreement of the use of Information Communication and Technology (ICT) in teaching in the pre-elementary.

Numerical Value	Statistical Limits	Descriptive Equivalent	Symbols
3	2.34 - 3.00	Agree	A
2	1.67 - 2.33	Neutral	N
1	1.00 - 1.66	DA	DA

On the degree of agreement of teachers on ICT use for performance purposes in the pre-elementary.

Numerical Value	Statistical Limits	Descriptive Equivalent	Symbols
3	2.34 - 3.00	Much Used	MU
2	1.67 - 2.33	Moderately Used	MoU
1	1.00 - 1.66	Least Used	LU

The degree of seriousness of the problems encountered in impact of ICT in the pre-elementary

Scale	Statistical Limits	Descriptive Equivalent	Symbols
3	2.34 - 3.00	Much Serious	MS
2	1.67 - 2.33	Moderately Serious	MoS

1 1.00 – Least LS
 1.66 Serious

IV. RESULTS

Table 1

As shown in table 1 the level of agreement of the use of Information Communication and Technology (ICT) in teaching in the pre-elementary teachers garnered the average weighted mean of 2.43 interpreted as agree. With ICT use enumerated use of ICT's is helpful for problem solving is 2.61, followed by the student use ICT's for gaining knowledge of 2.53, use of ICT's saves time of the students in learning process with weighted mean of 2.44, also the use ICTs to organize work is 2.34, followed by the teacher use ICT's with a computed weighted mean of 2.33 and the least is students take interest in the use of ICT's with a weighted mean of 2.30

ICT USE	WM	DE
1. Teacher use ICT's.	2.33	N
2. Use of ICT's is helpful for problem solving	2.61	A
3. Use of ICT's saves time of the students in learning process.	2.44	A
4. Use ICTs to organize work	2.34	A
5. Student use ICT's for gaining knowledge.	2.53	A
6. Students take interest in the use of ICT's	2.30	N
Average Weighted Mean	2.43	A

Numerical Value	Statistical Limits	Descriptive Equivalent	Symbols
3	2.34 - 3.00	Agree	A
2	1.67 - 2.33	Neutral	N
1	1.00 - 1.66	DA	DA

Table 2

On the degree of agreement of teachers on ICT use for performance purposes in the pre-elementary with a computed average weighted mean of 2.42 interpreted as used as to the ICT use for performance purposes five were rated by the respondents as much used these were the reinforcement of learning of skills through

repetition of examples with a weighted mean of 2.74, second the provision of remedial or enrichment support to individual students or small groups of students with weighted mean of 2.56, the third is support of inquiry learning weighted mean is 2.54, fourth were the assessment of students' learning through tests of 2.52, fifth were the Support of student-led whole-class discussions and presentations which is 2.38 followed by the mediation of communication between students and experts or external mentors 2.31, the last indicators were provision of feedback to students on their work computed weighted mean of 2.09 interpreted as moderately used

ICT Use for performance purposes	WM	DE
1. Support of student-led whole-class discussions and presentations	2.38	MU
2. Reinforcement of learning of skills through repetition of examples	2.74	MU
3. Support of inquiry learning	2.54	MU
4. Support of collaboration among students	2.24	MoU
5. Assessment of students' learning through tests	2.52	MU
6. Provision of feedback to students on their work	2.09	MoU
7. Mediation of communication between students and experts or external mentors	2.31	MoU
8. Provision of remedial or enrichment support to individual students or small groups of students	2.56	MU
Average Weighted Mean	2.42	MU

Numerical Value	Statistical Limits	Descriptive Equivalent	Symbols
3	2.34 - 3.00	Much Used	MU
2	1.67 - 2.33	Moderately Used	MoU
1	1.00 - 1.66	Least Used	LU

Table 3

The result shows that the degree of seriousness of the problems encountered in impact of ICT in the pre-elementary teachers in the province of Benguet and Baguio City were much serious with a computed weighted mean of 2.48, Moreover as presented in table 3 problems much serious is the lack of effective training as proven by the weighted mean of 2.67, followed by lack of teachers' competency with a mean of 2.66, lack of interest in teachers with a proven weighted mean of 2.63, as we go over lack of pedagogical models on how to use ICT for learning with a weighted mean of 2.52, and schools with limited ICT facilities also come up with 2.47, limited accessibility and network connection respondent rated as 2.36 and pressure to prepare students for exam and tests were both on moderately serious with 2.19 weighted mean.

Problems	WM	DE
1. Limited accessibility and network connection	2.36	MS
2. Schools with limited ICT facilities	2.47	MS
3. Lack of effective training	2.67	MS
4. Limited time	2.32	MoS
5. Lack of teachers' competency	2.66	MS
6. Pressure to prepare students for exam and tests	2.19	MoS
7. Lack of pedagogical models on how to use ICT for learning	2.52	MS
8. Lack of interest in teachers	2.63	MS
Average Weighted Mean	2.48	MS

Scale	Statistical Limits	Descriptive	Symbols
3	2.34 – 3.00	Much Serious	MS
2	1.67 – 2.33	Moderately Serious	MoS
1	1.00 – 1.66	Least Serious	LS

V. DISCUSSION

The results of this study show that the enhancement of information and communication technology (ICT) in teaching in the pre-elementary grade level is more valid or effective than the traditional way of teaching. Due to its helpfulness in solving a problem in teaching and learning for the teachers and learners interact with each other during the classroom discussion. This shows that the pre-elementary learners were active and comfortable with their environment as to the used ICT's learners were more interested in gaining knowledge. The results are in line with research finding by Ghavifekr, & Rosdy (2015) that proved using ICT in education would enhance students' learning. However, most of teachers in this study agree that ICT helps to improve classroom management as students are well-behaved and more focused. Moreover, this study proved that students learn more effectively with the use of ICT as lesson designed are more engaging and interesting. Accordingly, the participants agreed that integrating ICT can foster students' learning.

As shown in table 2 on the degree of agreement of teachers on ICT use for performance purposes in the pre-elementary grade level it was presented that ICT in the performance were frequently used by the teachers teaching in the pre-elementary grade level. It shows that reinforcement of learning of skills through repetition of examples is very much used by the pre-elementary teachers to improve the performance of the learners. In addition, provision of remedial or enrichment support to individual students or small groups of students were very much approve by the respondents. This implies that is very significant to improve the performance of the learners. In relation to the result of the study Information and Communication Technologies (ICT) have had a great impact on education. These new tools have become one of the means that a number of educational organizations use most frequently in pursuit of innovation and an improvement in quality of education, causing a change in the paradigms of teaching and learning, and in the way that communication between parents and teachers takes place (Bordalba & Bochaca, 2019).

Hence, the integration of ICT in teaching is vital for access to knowledge, and to maintain the pace of social

development. Therefore, new educational approaches and policies have emerged over recent years, aiming at improving educational systems by working with ICT whose use has shown positive results in different studies. In Spain, programs such have been implemented. The latter was oriented at the implementation of the 1:1 model –one computer per student in educational centers. The research project TICSE 2.0 analyzed the results, providing data about the organizational and pedagogical impact in classrooms and centers (Rueda, 2023).

The use of ICT in teaching is a relevant and functional way of providing education to learners in order to assist them in imbibing the required capacity for the world to work (Kosoko Oyedeko & Tella, 2010).

It was presented in table 3 that the degree of seriousness of the problems encountered in impact of ICT in the pre-elementary teachers were om much serious. This shows that significant problems were encountered by the pre-elementary teachers in enhancement of ICT in teaching and learning in the province of Benguet and Baguio City. This imply that serious problem was experience by the respondents is lack of effective training with high computed weighted mean as shown in the result from the table as to the reliability agreement of the researchers to the result were in teachers lack of training attended on ICT tools for teaching specially for this technology ages where in teachers must be updated from the platforms that being used today. Lack of training and financial support, as stated by Silva and Austillo (2012). Likewise, the study also includes the lack of recognition and incentive to teachers. Another barrier to highlight is the lack of time, which hinders the planning of educational work (Barrantes, Casas, & Luengo, 2011). On the other hand, Ramirez, Canedo, and Clemente (2011) show that the attitude of teachers towards ICT also constitutes a barrier to teacher training.

Lack of teachers' competency as one of the problems encountered by the respondents. This means that teachers were encountered a problem on the competent in the use of ICT tools in teaching and learning. As to research conducted by (Novela, 2022) Unfortunately, based on the researchers' observation, some of the teachers have minimal computer literacy and the district has no program for computer literacy for

teachers. Despite of the complete equipment and facilities available to every teacher for use in a computer literacy program, teachers learn operating computers by exploring and through the help of their peers. The research that was conducted affirmed in the result of the study that realizing the compelling need of teachers to be computer literate, the researcher was motivated to determine the computer competency of the teachers at Bulan 1 District. It is hoped that the results can help the researcher come up with a computer literacy program for teachers.

Lack of pedagogical models on how to use ICT for learning as one the most serious problem encountered by the respondents as mention by them. Whereas in some parts of the world, ICTs are contributing to revolutionary changes in the development process, in other parts of the world, the lives of people have hardly been touched by these innovations. Subject matter and pedagogical training are important concepts in the design of teacher training programs (Healey, 2000). It is apparent that most ICT teacher training programs in developing countries lack a robust theoretical framework (Hinett, 2002). It is imperative for ICT teaching and learning methods and methods of teacher training to blend meaningfully toward maintaining quality with ICT education. Therefore, pedagogical techniques have to be embedded in ICT training programs to obtain expected outcomes (Onguko, 2010). Quality methods related to teaching and teacher training are essential to achieve the learning outcomes maintained in international quality standards. One of the internationally accepted quality educational methodologies of teaching and learning is Bloom's taxonomy. However, other pedagogical techniques can also be used for the development of quality ICT education.

VI. FINDINGS

General findings of the study stated that enhancement of Information Communication and Technology in teaching in the public elementary school as observed teachers were effective and important as grate help in delivering the subject matter and learners were attentive and participate during the discussions and

activities but some challenges were experienced by the teachers as they use ICT for enhancement.

CONCLUSION

The level of agreement of the use of Information Communication and Technology (ICT) in teaching in the pre-elementary teachers were used by the teachers all the time due to its integrated in the curriculum in the basic education because it useful in helping for problem solving.

The respondents' level of agreement regarding teachers' use of ICT for performance purposes in pre-elementary education aligns with the reinforcement of learning skills through the repetition of examples.

The degree of seriousness of the problems encountered in impact of ICT in the pre-elementary teachers encountered a serious problem due to the barriers that encountered in the different school.

In future research researchers maybe focus the updated ICT tools or platforms and strategies to integrate in the modern way of teaching.

ACKNOWLEDGMENT

This study might not succeed without the help of other people who loved, cared and gave countless contributions and assistance to the researchers.

The ALMIGHTY FATHER, who is the constant source of strength and inspiration, wisdom, knowledge, guidance and unconditional love. Without Him, this endeavor could not have reached fruition or be made into reality.

With gratitude, the researchers wishes to acknowledge the following for their support, encouragement and assistance that made the realization of this study;

The school heads of different schools where the researchers conduct their study for allowing to float the questionnaires to the respondents;

Their adviser for her kindness, support, encouragement and assistance in processing the research.

REFERENCES

- [1] Almas and Krumsvik, (2008). Teaching in Technology-Rich Classrooms: is there a gap between teachers' intentions and ICT practices?
- [2] Bhasin, Bandhana (2012). Integration of Information and Communication Technologies in Enhancing Teaching and Learning.
- [3] Barrantes, G., Casas L. M., & Luengo, R. (2011). Perceived barriers to the integration of ICT for preschool and primary teachers in Extremadura. *Pixel-Bit: Revista De Medios Y Educación*, (39), 83-94.
- [4] Bordialba & Bochaca, (2019). Digital media for family-school communication? Parents' and teachers' beliefs.
- [5] Charalambidis, D. (2014). ICT in the future classrooms and teaching: Preparing the knowledge workers of the 21st Century. *IFIP Advances in Information and Communication Technology*, AICT-437, 56-62. Retrieved from <https://hal.inria.fr/hal-01391029/document>
- [6] Crisolo, (2018). Sharpening education through the use of Information and communications Technology.
- [7] DepEd (2010). Information and Communication Technology for Education Strategic Plan (DepED ICT4E Strategic Plan).
- [8] Department of Education (DoE). (2004). Draft White Paper on e-Education: Transforming learning and teaching through information and communication technologies (ICTs). *Government Gazette*, Vol. 470, No. 26734.
- [9] Dipendra, K.C., (2023). Background paper prepared for the Global Education Monitoring Report Technology in education – Southeast Asia
- [10] Flor, A.G. (2007). An appropriate use policy on information and communication technology (ICT) for education in the Philippines
- [11] Ghavifekr, & Rosdy (2015). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools.
- [12] Hassan, T., & Sajid, A. R. (2013). ICTs in Learning: Problems Faced by Pakistan.

- [13] Journal of Research and Reflections in Education, 7(1), 52 -64
- [14] Healey M, Jenkins A. Kolb's experiential learning theory and its application in geography in higher education. *Journal of Geography*. 2000;99(5):185-195
- [15] Hinett K. Improving learning through reflection. *The Higher Education Academy* Retrieved February. 2002;25.
- [16] Ismail, S. A. M. M., Jomezai, N. A., & Baloch, F. A. (2020). Hindering and enabling factors towards ICT integration in schools: A developing country perspective. *Elementary Education Online*, 19(3), 1537-1547. <http://dx.doi.org/10.17051/ilkonline.2020.733176>
- [17] Josol, Riela Angela C. Marigold M. Opre Cherry Mae B. Eltanal Cinder Dianne L. Tabiolo (2023). ICT Integration: Enhancing Pupils' Performance in Elementary Science. *International journal of advanced multidisciplinary studies*
- [18] Kaindio, P. M., & Wagithunu, M.N., (2014). Integrating Information Communication Technology Skills in Preschool Education in Kenya, *Mediterranean Journal of Social Sciences*, 5(5). Doi:10.5901/mjss.2014.v5n5p
- [19] Kamaruddin, Kamarulzaman & Che Abdullah, Che Anuar & Idris, Mohd. (2017). Integrating ICT in Teaching and Learning: A Preliminary Study on Malaysian Private Preschool. *International Journal of Academic Research in Business and Social Sciences*. 7. 10.6007/IJARBS/v7-i11/3561.
- [20] Kayode, O.,P., Olaronke, K.,B., (2014). Perceived importance of ICT in preparing early childhood education teachers for the new generation children. *International Journal of Evaluation and Research in Education (IJERE)*, 3 (2), 119-124.
- [21] Kosoko Oyedeko & Tella, (2010). Teachers' perception of the contribution of ICT to pupils performance in Christian Religious Education. *Journal of social Science*, 22, (1): 7-14.
- [22] Mechlova, and Malcik, (n.d.). ICT in Changes of Learning Theories.
- [23] Mjwara, P. (2017, June 2). Shaping the future of SA's economic growth through science, technology and innovation. *Mail & Guardian*. Retrieved from <https://mg.co.za/article/2017-06-02-00-shaping-the-future-of-sas-economic-growth-through-science-technology-and-innovation>
- [24] Mirzajani, H., Mahmud, R., Ayub, A. F. M., & Wong, S. L. (2016). Teachers' acceptance of ICT and its integration in the classroom. *Quality Assurance in Education*, 24(1), 26-40. <https://doi.org/10.1108/QAE-06-2014-0025>
- [25] MohdNawi, MohdNasrun.(2017). Teachers' Level of ICT Integration in Teaching and Learning: Survey in Malaysian Private Preschool. *AIP Conference Proceedings*. 1891.020075. 10.1063/1.5005408.
- [26] New Media Consortium, (2007). Design of educational and ICT conditions to integrate differences in learning: Contextual learning theory and a first transformation step in early education. *Computers in Human Behavior*, 23(3): 1499-1530
- [27] Novela, Lea Gersalia (2023). Teachers' Competency in Information and Communications Technology (ICT) in the New Normal.
- [28] Onguko, Hennessy S, B, Harrison D, Ang'ondi EK, Namalefe S, Naseem A, et al (2010). Developing the use of information and communication technology to enhance teaching and learning in East African schools: Review of the literature. In: Research Report. Centre for Commonwealth Education & Aga Khan University Institute for Educational Development–Eastern Africa; 2010.
- [29] Perez, D. (2016). ICT EDUCATION IN THE PHILIPPINES. Retrieved from <https://www.slideshare.net/Roan10379/ict-education-in-the-philippines>
- [30] Plump, T., Anderson, R. E., Law, N., & Qualex, A. (Eds.) (2009). *Cross-national information and communication: technology policies and practices in education* (2nd edition). Charlotte, NC: Information Age.
- [31] Qasem, A. A. A., & Viswanathappa, G. (2016). Teacher Perceptions towards ICT Integration: Professional Development through Blended

- Learning. Journal of Information Technology Education: Research, 15,561-575.
- [32] Ramirez, E., Canedo, I., & Clemente, M. (2011). Attitudes and beliefs of secondary teachers about internet use in their classrooms. *Comunicar*, 19(38), 47-155.
- [33] Rueda, et Al., (2023). Towards a coordinated vision of ICT in education: A comparative analysis of Preschool and Primary Education teachers' and parents' perceptions
- [34] Silva, J. E., & Austillo, A. A. (2012). Inserción de TIC en la formación inicial docente: Barreras y oportunidades [Insertion of ICT in the initial teacher training: Barriers and opportunities]. *Revista Iberoamericana de Educación*, 58(4).
- [35] Sharma, (2021). Impact of ICT on Teaching Practices in India
- [36] Sharma, Vikram, (2020). A Literature Review on an Effective Use of ICT in Education. *Journal of Computer Science and Technology Studies (JCSTS)*
- [37] Subong, P. (2006). *Statistics for Research*, Philippines, Manila: Rex Bookstore. Inc.
- [38] UNESCO. (2011). Transforming education: The power of ICT policies. United nations Educational, Scientific and Cultural Organization. Retrieved from <http://unesdoc.unesco.org/images/0021/002118/211842e.pdf>
- [39] Vygotsky, L. S. (1978). *Mind in Society*, Cambridge, MA: Harvard University Press.