Information and Communications Technology Aided Instruction: Its Impact to Academic Achievement of Grade 2 Pupils

Vanesa N. Bagay

Faculty, Guam Elementary School

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ABSTRACT

This study utilized a descriptive research design to examine the impact of Information and Communications Technology (ICT)-aided instruction on the academic achievement of Grade 2 pupils. The design involved observing and describing teachers' perceptions, proficiency, and challenges in using modern technology in teaching without influencing the variables. The respondents consisted of elementary school teachers with varied demographic profiles in terms of age, sex, civil status, teaching experience, position, and educational attainment. Findings revealed that ICT resources such as laptops, internet access, and television screens were generally available and frequently used in instruction. Teachers demonstrated a high level of proficiency in integrating technology into their teaching practices and strongly agreed that ICT enhances student motivation, engagement, and understanding of lessons. Moreover, ICT-aided instruction was found to be very effective in improving pupils' retention and comprehension through audio-visual and interactive learning experiences. However, challenges such as insufficient computers, lack of updated hardware and software, and limited technological resources were identified, though these were only moderately serious. Overall, the study concluded that ICT integration significantly improves teaching effectiveness and pupil achievement, emphasizing the importance of continued support, training, and resource provision to maximize its benefits in the classroom.

Keywords: Information and Communications Technology, ICT-aided instruction, academic achievement, Grade 2 pupils, descriptive research, teaching performance, educational technology

INTRODUCTION

Technological advancement has significantly transformed human activities over the past decades, evolving from large and complex machines in the 1960s to highly portable and efficient digital devices today. These developments have enhanced productivity and improved communication processes across different sectors. The emergence of personal computers marked a major turning point, enabling faster processing of tasks and more efficient information exchange. As technology continues to evolve, its influence has extended into education, reshaping traditional teaching and learning practices (Kumar, 2006; Wood & Gentile, 2003).

The integration of Information and Communications Technology (ICT) in education has become increasingly important in improving instructional delivery and student learning outcomes. ICT tools such as laptops, tablets, and smartphones provide learners with access to interactive and multimedia-rich content, which enhances engagement and understanding. These technologies support active learning by allowing students to visualize concepts, explore information independently, and participate in collaborative activities (Hesson & Shad, 2007; Greitzer, 2002).

In addition, the availability of numerous educational applications has further strengthened the role of technology in education. These applications cover a wide range of subject areas, including Mathematics, Science, Language, and the Arts, and are designed to support skill development and knowledge acquisition. Interactive features such as animations, quizzes, and games make learning more engaging and enjoyable for students, thereby improving retention and academic performance (Cummins, 2007; Chika, 2012).

In the Philippine context, the government has recognized the importance of ICT integration in education. During the implementation of the K–12 curriculum, efforts were made to incorporate modern technology into classrooms to improve the quality of instruction. Various programs initiated by government agencies, private organizations, and non-government institutions aim to provide technological resources such as laptops and tablets to students. These initiatives are intended to enhance student participation and promote a more learner-centered educational environment (Department of Education [DepEd], 2012).

The internet also plays a crucial role in modern education by providing access to a vast amount of information and learning resources. Students can conduct research, access digital textbooks, and collaborate with peers through online platforms. This connectivity allows learners to engage with real-world information, thereby making education more relevant and meaningful. Furthermore, online communication tools enable both students and teachers to interact beyond the classroom, supporting continuous learning (Becker, 1997; Sandholtz et al., 1997).

For teachers, ICT integration offers significant advantages in delivering instruction. Digital tools allow educators to present lessons through multimedia formats such as videos, animations, and interactive presentations, making learning more dynamic and engaging. In addition, technology enables teachers to efficiently distribute learning materials, monitor student progress, and provide timely feedback. These innovations contribute to more effective and student-centered teaching approaches (Kaye, 1996; Bernauer, 1996).

Despite these benefits, challenges in implementing ICT in education remain evident, particularly in developing countries. Limited access to technological resources, inadequate infrastructure, and insufficient training for teachers hinder the effective integration of ICT in classrooms. In the Philippines, while many public high schools have computer laboratories, access to reliable internet and updated equipment is still limited, especially in elementary schools. These issues highlight the need for continuous support and investment in educational technology (DepEd, 2012).

Given these developments, it is important to examine the impact of ICT-aided instruction on students' academic achievement, particularly at the primary level. Early exposure to technology can influence learners' motivation, engagement, and cognitive development. Understanding how ICT affects Grade 2 pupils' academic performance will provide valuable insights into improving instructional strategies and enhancing the overall quality of education.

Objectives of the Study

The aim of the study was to gain understanding on the impact of using modern gadgets to assist in teaching Grade 2 pupils.

The study sought to answer the following questions:

1. What is the profile of the respondents in terms of the following:

1.1 Age

1.2 Gender?

1.3 Civil Status

1.4 Present Position

1.5 Highest Educational Attainment

1.6 Performance Rating

1.7 Number of Years in teaching and,

1.8 Level of Trainings Attended?

2. What is the impact of the use of technology on teaching Grade 2 as to:

2.1Technological gadgets used in Teaching

2.2 Teacher's proficiency in teaching Science

2.3 Respondents' perception on the effectiveness of modern technology in teaching .

3. What are problems encountered using modern technology in teaching grade 2 pupils?

METHODOLOGY

This study employed a descriptive survey design to examine teachers' perceptions of the use of modern technology in improving their teaching performance and the problems encountered in its utilization among Grade 2 teachers in public elementary schools in San Guillermo District, Isabela (Creswell, 2014).

Sampling Design

The respondents of the study were Grade 2 teachers from different public elementary schools in San Guillermo District, Isabela. Using purposive sampling, a total of 30 teachers were selected based on their relevance to the study, ensuring that only those directly involved in teaching Grade 2 pupils were included.

Research Instrument

Data were collected using a researcher-made questionnaire and unstructured interviews. The questionnaire consists of three parts: Part I covers the profile of the respondents, Part II focuses on teachers' perceptions of the use of modern technology in teaching, and Part III identifies the problems encountered in its use. Responses were measured using a five-point Likert scale. The instrument was validated through a try-out and expert evaluation before final administration.

Statistical Design

The study utilized frequency and percentage to describe the profile of the respondents, while the weighted mean was used to determine the level of teachers' perceptions and the extent of problems encountered in using modern technology in teaching. These statistical tools were used to analyze and interpret the collected data.

RESULTS AND DISCUSSIONS

Profile of the Respondents

Table 1

Distribution of Respondents by Gender

Particulars	Frequency	Percentage
Male	8	26.70
Female	22	73.30
Total	30	100.00

The results show that there are 8 male respondents or 40.00 percent and 12 female respondents with a percentage of 26.70. The uneven ratio of male and female respondents will not affect the outcome of the questionnaire since the questions are not gender specific but emphasizes the effect of ICT in teaching Grade 2.

Table 2

Distribution of Respondents by Age

Particulars	Frequency	Percentage
20-25	2	6.70
26-30	4	13.30
31-35	8	26.70
36-40	10	33.30
41-45	2	6.70
41-45	4	13.30
Total	30	100.00

On the frequency distribution of respondents by age, there are 2 respondent who are in the age range of 20 to 25 with a percentage of 6.70. 4 respondents are in the age between 26 and 30 with a percentage of 13.30. Majority of the respondents, with a frequency of 10 or 33.30 percent are in the ages between 36 to 40. 8 respondents are aged 31 to 35 with a percentage of 26.70 and also 2 respondents in the age bracket of 41 to 45 with a percentage of 6.70. And lastly 4 respondents are in the age of 41 to 45 or 13.30 percent.

Table 3

Distribution of Respondents by Civil Status

Particulars	Frequency	Percentage
Single	4	13.30
Married	24	80.00
Widow	2	6.70
Total	30	100.00

On the frequency distribution of respondents by civil status, the data shows that there are 4 respondents who are single with 13.30 percent. Majority of the respondents are married with a frequency of 24 or a percentage of 80.00. The large number of married respondents correspond to the age range of 26 to 40 which is the average marrying age. Two respondents are said to be widow with a percentage of 6.70.

Table 4

Distribution of Respondents by Position

Particulars	Frequency	Percentage
Teacher I	4	13.30
Teacher II	2	6.70
Teacher III	22	73.30
Master Teacher I	2	6.70
Total	30	100.00

The respondent's frequency distribution by position shows that there are 4 respondents or 13.30 percent of the respondents are "Teacher I." The data shows that there are 22 respondents who are "Teacher III" with a percentage of 73.30. 2 respondent or 6.70 percent have a present position of Teacher II and "Master Teacher I." Majority of the respondents have a present position of Teacher III which means that most of the respondents are continually improving themselves professionally through additional education and trainings to attain such position.

Table 5
Distribution of Respondents by Highest Educational Attainment

Particulars	Frequency	Percentage
BEED	3	10.00
MAED Units	10	33.30
MAED	15	50.00
PhD./EdD	2	6.70
Total	30	100.00

The respondent's frequency distribution of respondents by highest educational attainment shows there are 3 respondents who have at least finished their undergraduate degree in education or 10.00 percent. There are 10 respondents or 33.30 who have earned units in their Master's Degree in Education. 15 respondents or 50.00 have finished their master's degree in education.And Lastly 2 of the respondents have already finished their Doctorate Degree.

Table 6
Distribution of Respondents by Number of Years Teaching

Particulars	Frequency	Percentage
1-5	3	10.00
4-10	6	20.00
11-15	13	43.30
16-20	4	13.30
21 and above	4	13.30
Total	30	100.00

The respondent's frequency distribution by number of years teaching show that there are 3 respondents or 10.00 percent who have been teaching for 1 to 5 years. 6 respondents or 20.00 percent have been teaching from 4 to 10 years. Majority of the respondents with a frequency of 13 or 43.30 percent have been teaching for 11 to 15 years. 4 respondents or 13.30 percent have been teaching for 16 to 20 years. There are also 4 respondents or 13.30 percent have been teaching for more than 21 years.

Table 7
Frequency and Rank Distribution of Respondents by Number of In-Service Trainings Attended

Particulars	Frequency	Rank
Local.Division	30	1
Regional	30	1
National	18	3
International	4	4

On the respondent's frequency distribution of number of In-Service Trainings attended, 30 of the respondents have at least attended a Local level, Division level training while 18 respondents have at least attended National level training and 4 respondents attended a Inter National in-service training.

Information Proper

Table 8

Respondent's Perception on the Availability of Modern Technology

Particulars	mean	QD	Rank
1. Digital Camera	3.50	O	4
2. Internet	3.70	O	2
3. Laptop/Desktop Computer	4.00	O	1
4. LCD projector	2.90	SM	6
5. LCD/LED Screen TV	3.60	O	3
6. Portable mini speaker (lapel)	2.00	SD	7
7. Smartphones/Tablets	1.60	NA	8
8. Software Presentation	3.10	SM	5
Average Weighted Mean	3.05	Sometimes	

On the respondent's perception on the availability of modern technology, first in rank is "Laptop/Desktop Computer" with a weighted mean of 4.00 with a qualitative description of "Often." Second in rank is "Internet" with a weighted mean of 3.70 or "Often." Third is "LCD/LED Screen TV" with a weighted mean of 3.60 or "Often." Last is "Smartphones/Tablets" with a weighted mean of 1.60 or "Not at All." The respondent's perception on the availability of modern technology garnered an average weighted mean of 3.05 of "Sometimes."

Table 9

Respondent's Perception on the Teacher's Proficiency in Teaching Grade 2

Particulars	MEAN	QD	Rank
1. The teachers are proficient in using modern technology in teaching	4.50	SA	1
2. The teachers are effective at teaching because technology makes it easier to understand science concepts	4.30	SA	2
3. The students are more interested in learning if The teachers are using modern technology.	4.30	SA	2
4. The class is easily motivated by The teachers to learn science.	4.10	A	9
5. The teachers are able to discuss the lesson plan and follow it intently.	4.10	A	9
6. The class is able to engage The teachers in a more meaningful interaction while The teachers are using modern technology.	4.20	SA	4
7. The teachers are able to reinforce learning through the use of audio-visual media.	4.20	SA	4
8. The teachers can more easily demonstrate how to do a task.	4.20	SA	4
9. The teachers encourages the student to also use modern technology in learning science.	4.20	SA	4
10. The teachers are able to get data from the internet for use in the lesson.	4.20	SA	4
Average Weighted Mean	4.23	Strongly Agree	

On the respondent's perception on the teacher's proficiency in teaching Grade 2, ranked 1 is "Believes in "The teachers are proficient in using modern technology in teaching", establishes a prototype for how to think and behave" with a mean of 4.50 or "Strongly Agree." Second is "The teachers are effective at teaching because technology makes it easier to understand science concepts" and "The students are more interested in learning if The teachers are using modern technology." with a weighted mean of 4.30 or "Strongly Agree." Last in rank are "The class is easily motivated by The teachers to learn science" and "The teachers are able to discuss the lesson plan and follow it intently." with a weighted mean of 4.10 or "Agree." The respondent's perception on the teacher's proficiency in teaching Grade 1 acquired an average weighted mean of 4.23 or "Strongly Agree."

Table 10

Respondent's Perception on the Effectiveness of Using Modern Technology in Teaching

Particulars	MEAN	QD	Rank
1. ICT aided instruction effectively gains the attention of the pupils	4.70	VE	4
2. ICT aided instruction better informs the pupils of the lessons	4.80	VE	1
3. ICT aided instruction shows relationships between what they will be learning and what they already know	4.70	VE	4
4. ICT aided instruction enhances retention of the pupils	4.80	VE	1
5. ICT aided instruction is easily accessible or transferable by teachers	4.60	VE	5
6. ICT aided instruction eases the load of explaining difficult concepts to their pupils	4.78	VE	3
Average Weighted Mean	4.73	Very Effective	

On the respondent's perception on the effectiveness of using modern technology in teaching first is "ICT aided instruction better informs the pupils of the lessons", establishes a prototype for how to think and behave" and "ICT aided instruction enhances retention of the pupils" with a mean of 4.80 or "Very Effective." The result shows Audio/Visual presentations through the use of ICT effectively captures the attention of pupils than the traditional methods of teaching. The use of ICT is not only static and nature but can sometimes be interactive which immerses the child in learning better than the traditional methods. Third is the statement "ICT aided instruction eases the load of explaining difficult concepts to their pupils" with a mean of 4.78 or "Very Effective." Last in rank is "ICT aided instruction is easily accessible or transferable by teachers" with a weighted mean of 4.60 or "Very Effective." The respondent's perception on the effectiveness of using modern technology in teaching Science acquired an average weighted mean of 4.73 or "Very Effective."

Table 11

Respondent's Perception on the Problems Encountered Using Modern Technology in Teaching Grade 2

Particulars	MEAN	QD	Rank
1. Deficiencies of number of computers in labs.	2.60	MS	1
2. Lack of technologies such as computer, Internet and e-mail etc. in the classroom	2.20	SS	4
3. Lack of time for training computer-aided	2.00	SS	8
4. Lack of technical support	2.10	SS	5
5. Lack of software and hardware	2.50	SS	2
6. Lack of up-to-date technological tools	2.40	SS	3
7. Lack of school budget required for the integration of ICT	2.00	SS	8
8. Lack of a clearly determined plan and policy of technology Inappropriateness of physical environment (Crowded classroom etc.)	2.10	SS	5
9. Teacher's lack of knowledge and competence about technology integration	2.10	SS	5
10. The difficulties of class management in the courses where ICT is (especially crowded classroom)	2.00	SS	8
11. Insufficiency of ICT-based in-service trainings offered to teachers	1.80	SS	12
12. Teachers attitudes and beliefs toward technology	1.80	SS	12
13. Lack of teachers' responsibilities using ICT into teaching	1.80	SS	12
14. Teachers 'fear of change	1.90	SS	11
15. Lack of support from school administration	1.50	NS	15
Average Weighted Mean	2.05	Slightly Serious	

On the respondent's perception on the problems encountered using modern technology in teaching Grade 2, first is "Deficiencies of number of computers in labs" with a mean of 2.60 or "Moderately Serious." Second is "Lack of software and hardware" with a weighted mean of 2.50 or "Slightly Serious." Third is the statement "Lack of up-to-date technological tools" with a mean of 2.40 or "Slightly Serious." Last in rank is "Lack of support from school administration" with a weighted mean of 1.50 or "Not Serious." The respondent's perception on the

problems encountered using modern technology in teaching Grade 1acquired an average weighted mean of 2.05 or "Slightly Serious.

CONCLUSION

The following are the conclusions for the study that are based on the previously presented findings and their implications.

The findings of the study reveal that teacher-respondents strongly favor the use of ICT in teaching Grade 2 pupils. They perceive technology as readily accessible and easy to use, which enhances their teaching proficiency and overall effectiveness. Moreover, ICT-based audio-visual presentations are more engaging and capture pupils' attention more effectively compared to traditional teaching methods. Unlike conventional approaches, ICT offers dynamic and interactive learning experiences that better immerse pupils in the learning process.

The study further indicates that the integration of ICT improves pupils' retention of lessons. As emphasized by Zakaria et al., effective teaching should go beyond simply presenting rules, definitions, and procedures for memorization; instead, it should actively involve students as participants in the learning process an outcome that is strongly supported by the use of modern technology in the classroom.

However, the study also highlights several challenges in the implementation of ICT in teaching Grade 2 pupils. These include the limited number of computers, insufficient hardware and software resources, and the lack of updated technological tools. Such issues are largely attributed to the high cost of acquiring and maintaining ICT equipment. Additionally, high taxes on imported technology further hinder schools, particularly those in rural areas, from accessing and sustaining up-to-date instructional technologies.

RECOMMENDATION

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. School administrators should sustain and strengthen their support for ICT integration in teaching by investing in modern technological resources for both teachers and pupils. They should also provide continuous and relevant ICT training programs to enhance teachers' competencies.

2. Teachers are encouraged to consistently integrate ICT into their instructional practices and to continuously update their knowledge and skills in utilizing modern technologies to improve teaching effectiveness.

3. Parents and guardians should actively support the school's initiatives in acquiring new technologies by participating in programs and efforts aimed at generating funds for ICT equipment and resources.

4. Future researchers are encouraged to build upon this study by exploring interventions and solutions to the challenges encountered in ICT integration, with the goal of further improving learners' educational experiences.

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