

The Department of Education Computerization Program and Effectiveness of Information and Communication Technology Integration for Students' Learning

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Abstract

This study describes, evaluates and correlates the DepED Computerization Program and the effectiveness of ICT integration for students' learning in Naga North District II in the school year 2025 to 2026.

The following questions were answered:

1. What is the school's readiness for the revised DCP learning facilities?;
2. What is the teachers' perspective on ICT integration in teaching?;
3. What is the level of teachers' digital literacy along the following aspects?
 - a. Digital technology skills;
 - b. Cyber security;
 - c. Collaboration;
 - d. Problem solving;
 - e. Adaptability to new technologies;
 - f. Digital creativity
4. What is the level of effectiveness of ICT integration for students' learning as assessed by the teachers?;
5. Are there significant differences among the aspects of teachers' digital literacy?;
6. Are there significant relationships between the school's readiness for DCP, teachers' perspective on ICT integration, level of teachers' digital literacy and perceived level of effectiveness of ICT integration for students' learning?;
7. What training program may be proposed based on the results of the study?

Descriptive- evaluative-correlational research design was used. Questionnaires were distributed to ninety-two teachers in Naga North District II in S/Y 2025 – 2026. Percentage frequency distribution was used to describe the variables. ANOVA was utilized to test differences among aspects of digital literacy. Last, Pearson correlation coefficient was employed to test the relationship of the variables.

School's readiness, perspective on ICT, digital literacy, and effectiveness of ICT have all high levels. ANOVA results indicated $F(5, 546) = 6.04, p = .000$, pertaining to highly significant differences among aspects of digital literacy. Pearson product-moment correlation analysis



resulted to $p = .000$), showing significant relationships among school's readiness, perspective on ICT integration, and effectiveness of ICT integration, and higher levels of teachers' digital literacy. Thus, a Seminar Training on ICT Integration for teachers is recommended.

Keywords: *Department of Education Computerization Program, information and communication technology integration, students' learning, digital literacy, Pearson correlation coefficient, ANOVA*

I. INTRODUCTION

Background and rationale

The problem is the differing viewpoints on effectiveness of the DepEd Computerization Program (DCP) on teachers' digital literacy. Stands on the effect of technology utilization to teacher performance swings from positive to negative. At the national level, perspective on technology is mixed, considering it as both positive and negative.

This study proposes the solution of clearly describing the relationship of the DepEd Computerization Program (DCP) on teachers' digital literacy in the local context. Amid shifting standpoints, it is highly imperative that a study on the implementation of DCP on teachers' digital literacy of local elementary school teachers be conducted to provide clear and contextual findings, conclusion and recommendations on the inclusion of technology in instruction. This study will give a definite direction on the extent of use of technology for the development of digital literacy and competence of Naga City elementary school learners.

Review of related literature

Scully (2024) and Alcober (2025) examined schools' readiness for a computerization program. Spector (2024) and Mandar (2024) among others described teachers' perspective on ICT integration on teaching. Kaffey (2024) and Strom (2021) described the effectiveness of ICT integration to student learning. Castro (2023) and the Department of Education (2025) described Filipino teachers' digital literacy skills. Ascione (2025) De Ramos and Esponilla (2022) described teachers' digital literacy on cyber security. MSUIIT (2025) and Lupina (2022) described the DepEd teachers' digital literacy on collaboration. Penn (2025) and Hidayat et al. (2025) described the relationship of digital literacy to problem solving skills. Info-Tech (2025) and Kumi et al. (2025) emphasized the importance of the aspect of adaptability to new technology in digital literacy. Fowler (2025) and Samper-Marquez and Oropesa-Ruiz (2025) emphasized the importance and development of creativity as an aspect of digital literacy.

Statement of the problem

The aim is to determine the relationship between the implementation of the revised DepEd Computerization Program (DCP) and teachers' digital literacy. At the same time, it seeks to answer the following questions:

1. What is the school's readiness for the revised DCP learning facilities?;
2. What is the teachers' perspective on ICT integration in teaching?;
3. What is the level of teachers' digital literacy along the following aspects:
 - a. Digital technology skills;
 - b. Cyber security;
 - c. Collaboration;
 - d. Problem solving;
 - e. Adaptability to new technologies;
 - f. Digital creativity
4. What is the level of effectiveness of ICT integration for students' learning as assessed by the teachers?;
5. Are there significant differences among the aspects of teachers' digital literacy?;



6. Are there significant relationships between the school's readiness for DCP, teachers' perspective on ICT integration, level of teachers' digital literacy and perceived level of effectiveness of ICT integration for students' learning?;
7. What training program may be proposed based on the results of the study?

Hypotheses

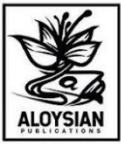
1. There are no significant differences among the aspects of teachers' digital literacy: digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity.
2. There are significant relationships between the school's readiness for DCP, teachers' perspective on ICT integration, level of teachers' digital literacy and perceived level of effectiveness of ICT integration for students' learning.

II. MATERIALS and METHODS

The study utilized a questionnaire as a data gathering instrument which is composed of four parts: School's readiness for the revised DCP learning facilities, Teachers' perspective on ICT integration in teaching, Effectiveness of ICT integration for students' learning and Teachers' Digital Literacy. School's Readiness to DCP facilities is composed of 9 items on the school's readiness on DCP in the form of availability of hardware devices, furniture, ventilation and lighting facilities. The questionnaire is adapted from DepEd Memorandum no. 075 s. 2016 IMPLEMENTATION OF THE DEPED COMPUTERIZATION PROGRAM (DCP) FOR BATCHES 29, 30, 31, 32 AND 33 E-CLASSROOM PACKAGES FOR PUBLIC ELEMENTARY AND SECONDARY SCHOOLS IN REGIONS I, II, III, IV-A, IV-B, V, VI, VII, VIII, X, XI, XII, ARMM, CAR, AND NCR Enclosure No. 2. Teachers' Perspective on ICT Integration in Teaching is composed of 14 items. Effectiveness of ICT Integration on Student Learning is composed of 10 items. These questionnaires were taken from DepEd Memorandum no 0726 conduct of computerization program monitoring and provision of technical assistance. Teachers' Digital Literacy questionnaire is composed of 20 questions on digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity. Questions 1 to 7 are on digital technology skills. Questions 8 to 12 are on cyber security. Questions 13 to 14 are on collaboration. Questions 15 to 16 are on problem solving. Questions 17 to 18 are on adaptability to new technologies. Questions 19 to 20 are on digital creativity. The questionnaire was taken and modified from Digital literacy scale: Validity and reliability study with the Rasch model by Ece, Avin and Fatih Doğan (2024).

Research Design

The descriptive- evaluative-correlational research design was used in the study describing school's readiness for the revised DCP learning facilities, teachers' perspective on ICT integration in teaching, effectiveness of ICT integration for students' learning, and teachers' digital literacy along aspects of digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity. This design was used in answering problems 1, 2, 3 and 4. The evaluative design was used to test significant differences among the aspects of digital literacy: digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity. This design was used



in answering problem 5. The correlational design was used to test the relationship among school's readiness for the revised DCP learning facilities, teachers' perspective on ICT integration in teaching, and effectiveness of ICT integration for students' learning and aspects of teachers' digital literacy: digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity. This design was used in answering problem 6.

Participants

The participants of the study were the total population of ninety-two (92) teachers in schools in Naga North District II currently employed in the school year 2025 – 2026. This population was taken from sixty-eight (68) teachers in Naga Central School II and twenty-four teachers in Naga City SPED Center.

Instruments

Survey questionnaire was used to gather data to answer problems 1, 2, 3 and 4. The survey questionnaire was used to describe school's readiness for the revised DCP learning facilities, teachers' perspective on ICT integration in teaching, teacher's digital literacy, and effectiveness of ICT integration for students' learning.

Procedure

Questionnaires were administered to the respondents upon the approval of the Dean, school head and approved informed consent document duly signed by the respondents.

Data Analysis

Percentage frequency distribution was used to describe the school's readiness for the revised DCP learning facilities, teachers' perspective on ICT integration in teaching, effectiveness of ICT integration for students' learning, and teachers' digital literacy along digital technology skills, cyber security, collaboration, problem solving, adaptability to new technology and digital creativity. Percentages were summarized. ANOVA was used to test the differences among the aspects of digital technology skills, cyber security, collaboration, problem solving, adaptability to new technology and digital creativity in teachers' digital literacy of teachers in schools in Naga North District II. The Pearson correlation coefficient was used to test the relationship of the school's readiness for the revised DCP learning facilities, teachers' perspective on ICT integration in teaching, and effectiveness of ICT integration for students' learning, with level of teachers' digital literacy along aspects of digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity, among teachers in Naga North District II.



III. RESULTS

Part of this manuscript is inclusive of results and findings that give out the answers to questions posed in the statement of the problem.

Problem 1

Findings: The level of schools' readiness for DCP learning facilities has a mean of 64.85%, at high level.

Table 1
Schools Readiness for DCP Learning Facilities

INDICATORS	Mean	INTERPRETATION
At least 2 units of stand fan	84.78	Very High
Sufficient electrical lighting	82.60	Very High
Proper electrical wirings and outlets duly certified by the Municipal/City electrician	79.34	Very High
Windows and doors with grills	73.91	High
Multi-media Classroom	63.04	High
Provision of adequate security mechanisms	59.78	High
50 pieces (HS)/ 40 pieces (ES) mono chairs	47.82	Low
School Inspectorate team were organized	47.82	Low
Computer Tables	44.56	Low
MEAN	64.85	High

Legend: 100.00 - 75.01 - Very High 75.00 - 50.01 - High 50.00 - 25.01 - Low 25.00 - 0.00 - Very Low

Problem 2

Findings: The level of teachers' perspective of ICT integration in teaching is very high, with a mean of 3.27.

Table 2
Teachers Perspective of ICT Integration in Teaching

INDICATORS	Mean	INTERPRETATION
The use of ICT helps to prepare teaching resources and materials.	3.83	Highly Positive
The use of ICT helps teachers improve teaching with more updated materials.	3.83	Highly Positive
The use of ICT enables the student's to be more active and engaging in the lesson.	3.79	Highly Positive
The use of ICT improves the quality of teaching.	3.79	Highly Positive
ICT supported teaching makes learning effective.	3.75	Highly Positive
Aware of the great opportunities that ICT offers for effective teaching.	3.72	Highly Positive
Feels confident learning new computer skills.	3.65	Highly Positive
Has more time to cater to students need if ICT is used in teaching.	3.63	Highly Positive
Find it easier to teach by using ICT.	3.62	Highly Positive
Can still have an effective teaching without the use of ICT.	3.41	Highly Positive
Confident that my students learn best without the help of ICT.	2.52	Positive
The classroom management is out of control if ICT is used in teaching.	2.22	Negative
Students' pay less attention when ICT is used in teaching.	2.14	Negative
The use of ICT in teaching is a waste of time.	1.92	Negative
MEAN	3.27	Highly Positive

Legend: 4.00 - 3.26 – Highly Positive 3.25 - 2.51 – Positive 2.50 - 1.76 - Negative 1.75 - 1.00 – Highly Negative



Problem 3

Findings: The level of teachers' digital literacy is mostly very high. This finding is also the same with digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity.

Table 3

A. Digital Literacy along Digital Technology Skills

INDICATORS	Mean	INTERPRETATION
Feel confident in my searches for information on the internet in preparation for lessons.	3.52	Highly Positive
Using digital tools increases my interest in teaching.	3.51	Highly Positive
Install educational applications on digital technology devices (mobile phone, tablet, computer, etc.)	3.49	Highly Positive
Finds it easy to research topics on the internet in preparation for classes	3.49	Highly Positive
Can easily express my thoughts in my social communication with digital resources.	3.47	Highly Positive
Finds it easy to prepare lessons and accomplishing other tasks online.	3.36	Highly Positive
Have sufficient skills in digital technologies.	3.26	Highly Positive
MEAN	3.44	Highly Positive

Legend: 4.00 - 3.26 – Highly Positive 3.25 - 2.51 – Positive 2.50 - 1.76 - Negative 1.75 - 1.00 – Highly Negative

Table 4

B. Digital Literacy along Cyber Security

INDICATORS	Mean	INTERPRETATION
Can use passwords to protect my Technological devices where my personal information is recorded.	3.66	Highly Positive
Some of the information I find on the internet may be reliable.	3.51	Highly Positive
Knows the rules to follow when using digital tools (commenting, sharing personal information, etc.)	3.50	Highly Positive
Using digital technologies for long periods of time can affect my health.	3.47	Highly Positive
Have sufficient knowledge on issues related to cyber security, internet fraud, fraud, etc.	3.38	Highly Positive
MEAN	3.50	Highly Positive

Legend: 4.00 - 3.26 – Highly Positive 3.25 - 2.51 – Positive 2.50 - 1.76 - Negative 1.75 - 1.00 – Highly Negative

Table 5

C. Digital Literacy along Collaboration

INDICATORS	Mean	INTERPRETATION
Often collaborate with my co-teachers over the internet (Skype, Facebook, Zoom, Microsoft Teams, etc.)	3.47	Highly Positive
Can work in a team, collaborating well with my peers, using digital technologies.	3.45	Highly Positive
MEAN	3.46	Highly Positive

Legend: 4.00 - 3.26 – Highly Positive 3.25 - 2.51 – Positive 2.50 - 1.76 - Negative 1.75 - 1.00 – Highly Negative

Table 6

D. Digital Literacy along Problem Solving

INDICATORS	Mean	INTERPRETATION
Can solve technological problems of programs or tools.	3.20	Positive
Know how to solve the technical problems I encounter with digital technologies (tablet, phone, computer, smart board, etc.)	3.08	Positive
MEAN	3.14	Positive
Legend: 4.00 - 3.26 – Highly Positive 3.25 - 2.51 – Positive 2.50 - 1.76 - Negative 1.75 - 1.00 – Highly Negative		

Table 7

E. Digital Literacy along Adaptability to New Technologies

INDICATORS	Mean	INTERPRETATION
Can learn new digital technologies with ease	3.34	Positive
Follow important new technologies.	3.21	Highly Positive
MEAN	3.28	Highly Positive

Table 8

F. Digital Literacy along Digital Creativity

INDICATORS	PERCENTAGE	INTERPRETATION
Can use digital teaching materials (For example: Presentations, digital stories, blogs, etc.) to present lessons.	3.50	Highly Positive
Can easily prepare posters, banners, collages, etc. in digital environment	3.38	Highly Positive
MEAN	3.44	Highly Positive
Legend: 4.00 - 3.26 – Highly Positive 3.25 - 2.51 – Positive 2.50 - 1.76 - Negative 1.75 - 1.00 – Highly Negative		

Problem 4

Findings: The level of effectiveness of ICT integration for student learning is very high, with mean of 3.58.

Table 9
Level of Effectiveness of ICT Integration for Student's Learning

INDICATORS	Mean	INTERPRETATION
ICT allows students' to be more creative and imaginative.	3.76	Highly Positive
The use of ICT helps students to find related knowledge and information for learning.	3.73	Highly Positive
The use of ICT increases the students' confidence to participate actively in class.	3.70	Highly Positive
The use of ICT helps to broaden students' knowledge paradigm.	3.67	Highly Positive
The use of ICT promotes active and engaging lessons for students best learning experience.	3.59	Highly Positive
The use of ICT encourages students to communicate more with their classmates.	3.55	Highly Positive
The use of ICT enables the students to express their ideas and thoughts better.	3.50	Highly Positive
The use of ICT helps to improve student's ability specifically in reading and writing.	3.45	Highly Positive
Students learn more effectively with the use of ICT.	3.43	Highly Positive
The students are more behave and under control with the use of ICT.	3.37	Highly Positive
MEAN	3.58	Highly Positive

Legend: 4.00 - 3.26 – Highly Positive 3.25 - 2.51 – Positive 2.50 - 1.76 - Negative 1.75 - 1.00 – Highly Negative

Problem 5

Findings: There are highly significant differences among the aspects of teachers' digital literacy. The null hypothesis: There are no significant differences among the aspects of teachers' digital literacy: digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity, is rejected.

Table 10
Differences among Aspects of Teachers' Digital Literacy

	Sum of Squares	df	Mean Square	F	Sig.	Interpretation
Between Groups	9.207	5	1.841	6.042	.000	Very Significant Highly
Within Groups	166.394	546	.305			
Total	175.601	551				

Legend: $p \leq 0.001$ very highly significant, $p \leq 0.01$ highly significant, $p \leq 0.05$ significant, $p > 0.05$ not significant

Problem 6

Findings: The school's readiness for DCP, teachers' perspective on ICT integration, teachers' digital literacy, and perceived level of effectiveness of ICT integration for students' learning have a positive and very highly significant relationship with each other.

Table 12
Pearson Correlation Results on Relationship between Level of Implementation and Digital Literacy

Aspects of Implementation	Pearson Correlation	p-value	Interpretation
Readiness for DCP	.382	.000	Very Highly Significant
Perception on ICT	.485	.000	Very Highly Significant
Effectiveness of ICT	.524	.000	Very Highly Significant

Legend: $p \leq 0.001$ very highly significant, $p \leq 0.01$ highly significant, $p \leq 0.05$ significant, $p > 0.05$ not significant



Problem 7

Findings: This study recommends teacher training on pedagogical integration of ICT, and continuous monitoring of ICT's impact on student learning outcomes, and enhancement of teachers' digital problem-solving abilities through focused capacity-building initiatives, mentoring, and experiential ICT integration workshops.

Descriptive statistics

School's readiness for DCP learning facilities has a mean percentage of 64.85%. Teachers' perspective of ICT integration has a mean percentage of 3.27, level of effectiveness of ICT integration for student learning with 3.58; digital technology skills with 3.44, cyber security with 3.50, collaboration with 3.46, problem solving with 3.14, adaptability to new technologies with 3.28, digital creativity, 3.44. Overall level of teachers' digital literacy has a mean score of 3.38.

Inferential statistics

ANOVA results indicated $F(5, 546) = 6.04, p = .000$. The obtained p-value was less than .001, indicating that the differences are very highly significant among aspects of teachers' digital literacy.

Pearson product-moment correlation analysis resulted to $p = .000$, indicating that higher levels of school's readiness for DCP learning facilities, teachers' perspective on ICT integration in teaching, higher levels of teachers' digital literacy, and perceived level of effectiveness of ICT integration on students' learning are associated with each other.

IV. DISCUSSION

Interpretation of findings

School's readiness for DCP learning facilities was interpreted as high. Teachers' perspective on the integration of ICT in teaching is very high. Level of teachers' digital literacy along the following aspects of a. Digital technology skills, which was interpreted as very high; b. Cyber security, which was interpreted as very high; c. Collaboration, which was interpreted as very high; d. Problem solving, which was interpreted as high; e. Adaptability to new technologies, which was interpreted as very high; and f. Digital creativity, which was interpreted as very high. Level of effectiveness of ICT integration for students' learning as assessed by the teachers was interpreted as very high.

There are highly significant differences among the aspects of teachers' digital literacy: digital technology skills, cyber security, collaboration, problem solving, adaptability to new technologies, and digital creativity. School's readiness for DCP, teachers' perspective on ICT integration, teachers' digital literacy, and perceived level of effectiveness of ICT integration on students' learning have a positive and very highly significant relationship with each other. The alternative hypothesis: There is a significant relationship between school's readiness to DCP learning facilities, teachers' perspective on ICT integration in teaching, and level of effectiveness of ICT integration on student learning, with teachers' digital literacy, is accepted.



This study recommends teacher training on pedagogical integration of ICT, with enhancement of teachers' digital problem-solving abilities.

Comparison to existing studies

The literature and studies have on varying extents explored and investigated the variables used in the current study. Similarly, the current study will determine the relationship between utilization of technology in the implementation of the revised DepEd Computerization Program (DCP) and teachers' digital literacy. This current study will describe schools' readiness to DCP, teacher's perception on ICT integration in teaching, teachers' digital literacy, and effectiveness of ICT integration in student learning. It will evaluate the relationships among these aspects. It will describe teachers' digital literacy along the aspects of digital literacy skills, cyber security, collaboration, problem solving, adaptability to new technologies and digital creativity. It will similarly evaluate the differences among these aspects. The study will evaluate the relationship of school's readiness to DCP, perspective of teachers on ICT integration, teachers' digital literacy, and effectiveness of ICT integration on students' learning. It will propose recommendations based on the results.

Implications for practice and policy

The implementation of DepEd Computerization Program has been effective. Schools have ready physical facilities. Teachers have positive perspective on the effective ICT integration on student learning. Teachers have high digital literacy, although some aspects (particularly, problem solving) relatively lag behind. Physical facilities, teachers' perspective teachers' digital literacy and effectiveness of ICT integration are significantly related to each other.

Therefore, the implementation of DCP has to be reinforced. Teachers have to be further trained on ICT integration. Digital problem solving skills and adaptability to new technologies have to be improved.

Study limitations

The study is limited in its provincial urban setting. Finding may be different in schools in rural areas or in larger urban areas. The social environment may have effects on teachers' and learners' exposure to technology.

V. CONCLUSION

Summarized outcomes

School readiness in physical facilities, teachers perspective on ICT integration, teachers' digital literacy, and effectiveness of ICT integration on student learning are all high. There are significant differences among aspects of teachers' digital literacy with relatively lower levels in the aspects of problem solving, and adaptability to new technologies. School readiness, teachers' perspectives, and effectiveness of ICT integration have a significant relationship with teachers' digital literacy, suggesting that the implementation of DCP promote digital literacy. Teacher training on ICT integration is recommended.

**Recommendations for future research or implementation**

Promote the implementation of DepEd Computerization Program (DCP) to effectively promote teachers' digital literacy. Development of DCP will develop digital technology skills, cyber security, collaboration, problem-solving, adaptability to new technologies, and digital creativity. Programs should be implemented to improve school readiness, teachers' perspective on ICT integration, and effectiveness of ICT on student learning. More specifically, focus should be given on training programs on improving effectiveness of ICT integration on student learning. These aspects should be related to the development of digital literacy.

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