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Determinants of Students Performance in Information and Communication Technology Program in Deped Secondary Schools

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ABSTRACT

This study investigated the relationship between the observed organizational attributes and determinants of students performance in the information and communications technology program along five factors: *provision of equipment, training of teachers, administrative support, monitoring and Evaluation assessment, and leadership style of school heads* and learner's *academic performance* in terms of mean percentile scores involving 59 classroom teachers in five public secondary schools in DepEd Eastern Samar division during the school year 2023-2024. The data concerning the respondents' perceived observation on the determinant factors of students' performance in ICT program were collected via an expert validated researcher-modified survey instrument and analyzed using frequency count, percentage, mean, spearman rho correlation at 0.05 level of significance. Findings revealed that all of the organizational attributes and determinant factors were "*moderately observed*" with a mean of 3.3146 and the learner's academic performance in ICT were "*satisfactory*" at an average of 78.98%. Test on correlation indicated that *training of teachers* (p=0.45) as a determinant of success is significantly related to the learner's academic performance in ICT. All the other determinant factors have p-values greater than the level of significance i.e., *provision of equipment* (p=.864), *administrative support* (p=.134), *M & E Assessment* (p=.191) and *leadership style of school head* (p=.160) and are not significantly related to the performance of learners in the DepEd secondary schools. Thus, the null hypothesis saying that there is no significant relationship between these determinant factors to the academic performance of learners in DepEd secondary schools is therefore true and accepted. Hence, the researcher recommends the conduct of extensive ICT training programs for teachers for them to teach better and to advance the digital literacy in Philippine schools.

Keywords: Information and Communications Technology, Information and Computer Fundamentals, ICT Program Implementation, Learners Academic Performance.

Introduction

The continuous advancement of technology and information exchange across countries around the globe brings out ways and systems to improve work and managerial effectiveness. In the context of education, academic institutions utilize information systems to "digitalize their services like admission, evaluation, examination, provisional mark memo, submission of assignments, and even attendance of students and teachers" (Sahebrao & Bajranglal, 2019, p. 23). In general, the use of information systems provides a robust mechanism among schools to rethink and redesign their approaches and processes, given the fast

processing of data which will lead to effective and efficient delivery quality education and services.

Unfortunately, despite these extensive efforts in DepEd to support teachers by integrating information and communication technologies (ICT) into their classroom practice, several researchers have reported the enormous challenges teachers face in using IT-based tools (Pratt 2016, Lupina 2021). In addition, González-Sanmamed (2016) unveiled that most educators are less confident in utilizing ICT tools to promote the development of more complex educational processes in the documentation, evaluation, and organization of data.

In the Philippines' public basic education setting, various computer-based platforms and ICT infrastructure were put in place for data handling and records management (DepEd, 2015). These include among others Enhanced Basic Education Information system (EBEIS)-Learners Information System (LIS), Employees Human Resource Information System (EHRIS) and software packages such as Microsoft Office 365. The registering and updating of students' records is mostly assigned to teaching personnel, who may be a subject teacher or a class adviser, due to the minimal number of non-teaching staff, especially among barangay or small-size schools. These problems directed the Department of Education to develop an electronic information system that manages schools' data, including learners' personal information up to schools' infrastructure and resources, (DepEd, 2015). One of its most utilized facilities is the Learners' Information System (LIS) where teachers can encode learners' details and update their statuses. Unfortunately, Llego (2018) mentioned that the most misused facility is noted for erroneous data entries among teachers/LIS in-charge.

Notably, the Asian Development Bank (2020), in their review of the country's monitoring and evaluation system, revealed that "human resources and technical capacity are not aligned with reporting requirements and that DepEd's institutional capacity is inadequate for the development and maintenance of various information systems" (p. 5). DepEd Schools have also adopted some new methods and techniques in education in the forms of virtual learning, blended learning, and stunt centered learning powered by information and communication technology or ICT. DepEd (2020) emphasized that this new system of modalities in instruction entails the use of technology and while pedagogies are readily available, the teachers must retool themselves to keep them abreast with digital technologies Gonzales (2020).

In the context of monitoring and evaluation (M&E) and report sharing, the DepEd district of San Julian (Balaclaot, 2022) is beseeched with delays in the turnout of reports and deliverables, including M&E-related data reported regularly. These could be attributed to some extent to the implementation parameters as outlined in the DCP ICT guidelines.

The absence of empirical data on the underlying enabling factors in the students' performance in DepEd's ICT program in the secondary schools of the division of Eastern Samar, prompted the researcher to conduct this correlational research and look into these parameters that may influence, directly or indirectly associates the determinants of students performance in ICT program and whether this situation is, to some extent, related to the academic performance of learners in ICT for the school year 2023-2024. This information gap is addressed by this study.

Statement of the Problem

A quantitative descriptive-correlational study was conducted on the factors and determinants of students' performance in ICT program in the department of education particularly in selected secondary schools in the division of Eastern Samar for the school year 2023-2024.

Specifically, this study will address the following research questions:

1. What are the determinants of student performance in ICT program in DepEd secondary schools in terms of the following:
1.1 provision of equipment,
1.2 training of teachers,
1.3 administrative support,
1.4 monitoring, evaluation and assessment, and
1.5 leadership style of school head;
2. What is the academic performance of learners in ICT in DepEd secondary school in terms mean percentile score?
3. Is there a significant relationship between the determinant factors of students' ---formance in ICT program and academic performance of learners in DepEd secondary schools?

Methodology

The researcher employed the quantitative method of research specifically the descriptive-correlational research design in determining the schools' organizational attribute factors as observed determinants and its association to the learner's academic performance in ICT and computer related program implementation. The quantitative method was used since the study was focused on quantifying the collection of data using an adapted self-modified questionnaire for the research variables considered in this study. Data were collected only once from the respondent fits into the cross-sectional survey research where the "data collected at one point in time from the same group of respondents, although the time it takes to collect all of the data may take anywhere from a day to a few weeks or more" (Fraenkel, Wallen and Hyun, 2012).

The descriptive correlation design was aimed at finding out if there was a significant relation between the observed determinant-factors of student's performance in ICT program and the learners' academic performance. Determinants of student's performance level were of five sub variables namely: 1) Provision of equipment, 2) Training of teachers, 3) Administrative support, 4) Monitoring, evaluation and assessment processes, and 5) Leadership styles of school head. Afterwards the researcher ascertained the learner's academic performance in ICT in terms of mean percentile scores. Secondary data were extracted from the quarterly MEA reports or the school PROMEDS. Finally, *a* correlation analysis was conducted to determine if there is significant relationship between the determinant attributes and the learner's academic performance in ICT for the academic year 2023-2024.

The north cluster districts of DepEd school's division of Eastern Samar covering five selected secondary schools offering ICT program either in the junior high school or Senior High School departments was identified and respondent's schools were Nena National High School in the District of San Julian, Sulat National High School in Sulat district, Taft National High School in Taft District, Can-Avid National High School in Can-Avid district, and Dolores National High School in Dolores District. These public secondary school are offering ICT program subjects such as Information and Communications Technology (ICT) and or the modified curriculum subject Internet and Computing Fundamentals (ICF), Empowerment Technologies (ET) and Media and Information Literacy in the Senior High School. The schools are also recipients of the DepEd DCP computerization program and its attached packages. Although the use of ICT, EBEIS, LIS, EHRIS and Office 365 *sy*stems is required to both public and private schools offering basic education in the Philippines, the researcher delimited the locale of the study in this

secondary schools in the district to capture a more contextualized extent of ICT program implementation in an entirely exclusive manner, possible.

The respondents of this study were the 59 purposively sampled teachers handling Information and Communications Technology (ICT), Internet and Computing Fundamentals (ICF), Empowerment Technologies (ET), and Media and Information Literacy (MIL) subjects in the junior and senior high school curriculum levels in the selected schools. The inclusion criteria of the teachers who were asked to participate in the study were as follows: 1) they are teaching ICT and computer related subjects/classes in the junior and or senior high school department in the selected respondent schools who are recipient of the DepEd Computerization package (DCP) program, 2) the same teacher in the first criterion who are regular-permanent employees during the school year 2023-2024, and 3) these teachers have LIS class accounts and are using ICT software and hardware in the teaching and learning and class management aspects including MS Office 365 platforms and part of their records management, are users of electronic class records, and computers with software commonly used in data management.

This total number of ICT teachers deemed satisfy the minimum number of acceptable sample size based on the suggestion of Tijol, (2022). It is said that the minimum acceptable sample size should depend upon the type of research, that is for descriptive research 10% of the population and for correlational research-30 subjects.

The researcher identified the study participants based the following inclusion criterion: 1) They are class advisers and teachers with online advisory LIS account, 2) their school is a recipient of DepEd computerization computer Package and 3) they are using ICT based platforms in their records management and in the teaching and learning routines. The criterion reference used for sampling learners is based on their being enrolled in ICF-ICT subjects for the current school year.

The study utilized an adapted researcher-modified survey questionnaire (Appendix E) to capture the relevant information and context to answer the specific research objectives. A cover letter was placed before the part contained the items which contained the statements on the determinant factors and success level of DepED ICT program implementation along the five sub variables. A general direction was written requesting the teacher-respondent to give their honest reflection and perception or observation to the statements stated.

Part I of the questionnaire is a checklist-type survey with statements and indicators benchmarked from the DepEd ICT-DCP program operations memoranda and implementing guidelines. These indicators are indicative of school organization and leadership attributes and enabling mechanisms as sub variables categorized: 1) Provision of equipment, 2) Training of teachers, 3) Administrative support, 4) Monitoring, evaluation and assessment processes, and 5) Leadership styles of school head. In this part of the questionnaire, the respondents were tasked to fill in their observations on the ICT and DCP program implementation by placing a checkmark (/) on the appropriate line and column along the 5-point scale specifically: 5-very highly observed, 4-highly observed, 3-moderately observed, 2-fairly observed and 1-not observed.

Part II of the questionnaire asks about the school quarterly Monitoring, Evaluation and Adjustment (MEA) report and PROMEDS for grading quarter 1 and 2. This secondary data seeks to answer the academic performance of the learners measured along seven scale categories based on DepEd (2015) grading system namely: Outstanding (O), Very Satisfactory (VS), Satisfactory (S), Did Not Meet Expectations (DMNE).

The prepared research instrument particularly that which sought to obtain data on ICT program implementation were subjected to content and language validity review by three experts on the field

following the DepEd language and content evaluation of research instrument template (DepEd, Quality Assurance Division), and for content and reliability through expert analysis and the Internal Consistency Method using Cronbach Coefficient Alpha (Statistics solutions (n.d.). Copies of the questionnaire were submitted to three experts on language and research content, the Research Adviser as well as to the Research Advisory Committee for expert analysis as to its language, content and structure. After their comments and suggestions were incorporated, the questionnaire was finalized and pilot tested among 25 teachers in Santa Fe National High School Division of City Schools Borongan. It has the same characteristics as the school district of the DepEd north cluster districts. These procedures are in accordance to the ideas as used by Tijol (2022).

An overall Cronbach alpha value of 0.97 were obtained to show that the material is acceptable to use in this undertaking. Tijol (2022) stated that if Cronbach's alpha value is or higher than 0.70, the instrument is considered reliable. In this study, results of the scale reliability test of 0.97 performed using statistics solutions (n.d.) could be interpreted that the research instrument is acceptable in terms of reliability quality. The variables of this study were quantified using interval scale data with five-point responses. To interpret the data on observed organizational attributes and enabling mechanisms indicative of the student's performance in ICT program, the following scale was used

Scale	Range	Interpretation
5	4. 50 – 5.00	Very highly observed
4	3.50 – 4.49	Highly observed
3	2.50 – 3.49	Moderately Observed
2	1.50 – 1.49	Fairly Observed
1	1.00 – 1.49	Not Observed

On the ***learner's academic performance in ICT*** in terms of mean percentile scores, the following categories (DepEd, 2015) were described as follows:

Scale	***Description***
96- above	Outstanding (O)
86-95	Very Satisfactory (VS)
76-85	Satisfactory (S)
75-below	Did Not Meet Expectations (DMNE)

In assessing the degree of correlation made through the result of ordinal data such as the respondents' observations on organizational attributes as indicators on: Provision of equipment, Training of teachers, administrative support, Monitoring, evaluation and assessment processes, and Leadership styles of school head to the learners' academic performance in terms of mean percentile scores, Dancy and Reidy (2004) measures were used.

Estimated Values (*r*)	Interpretation of Correlation
0.70 – 1.00	Very strong
0.40 – 0.69	Strong
0.30 – 0.39	Moderate
0.20 – 0.29	Weak
0.01 – 0.19	Negligible

The data were coded, entered and analysed using R-commander. The statistical tools below were used in trying to answer the statements of the problem. The Alpha (ά) value for test of significant relationships was set at 0.05 level of significance.

Mean was used to measure the determinants of students' performance in ICT program in DepEd Secondary schools in terms of provision of equipment, training of teachers, administrative support, M & E Assessment and leadership style of school head.

Spearman rho Correlation. Since the data on the determinants of students' performance level in ICT program in DepEd Secondary schools are at ratio level, Spearman rho correlation was utilized to determine if there is significant relationship between the determinants of students' performance level in ICT program and the academic performance of learners in DepEd Secondary Schools.

The data was tabulated, organized, analyzed and interpreted with the use of descriptive as well as inferential statistical tools, including frequency count, percentage, median, Pearson's Product-Moment Coefficient of Correlation (Pearson's r), set at 0.05 level of significance.

In every step of the data collection procedure, the researcher observed ethical standards in adherence to international and national ethics protocols and in observance of three ethical principles, as follows: (1) Justice; (2) Respect; and (3) Beneficence**.** The consent forms indicated that the participation is voluntary and no risks will be incurred if they choose so to participate and they could withdraw at any time or could refuse to answer any of the questions. Data collection was confidential and the teachers were assured that no information will in anyway identify them. They were also assured that these data will be kept confidential and cannot be used in any legal actions against them.

Results and Discussion

The first part of the research problem focuses on the determining factors on the successful implementation of the DepEd Computerization program in DepEd secondary schools. Respondent-teachers in the selected schools in the north cluster districts of the school's division of Eastern Samar were asked to reflect on the statements along five sub variables on determinants of students' performance in ICT program implementation in their respective schools specifically on: 1) provision of equipment, 2) training of teachers, 3) administrative support, 4) monitoring, evaluation and assessment, and 5) leadership style of school head.

For the purpose of reflecting the respondents perceived observations as stated in the data analysis, a scale of 5 to 1 was used with the following descriptive correspondence per measure of variable: 5-very highly observed, 4-highly observed, 3-moderately observed, 2-fairly observed and 1-not observed. A list of benchmark statements per sub variable were presented for the respondents to reflect on. All 59 respondents from the 5 selected schools responded to the survey results are presented in tables 2 to 6.

As presented in table 2, of the ten statements pertaining to provision of equipment, the respondent teachers highly observed with a mean of 3.54 and 3.51 on the schools provision of ICT equipment both software and hardware on an acceptable computer student ratio as well as the availability, and maximization of use of ICT equipment in the laboratory, while moderately observed on all the rest of statements on materials provision, internet connection and infrastructure, inclusion ICT provision on school SIP and institutionalization of a strong feedback mechanism. The determinant variable on provision of equipment equates to a mean of 3.230 interpreted as moderately observed. This observation parallels with the study of Tijol (2022) positing that 60% of teacher asked on problems related to ICT implementation is on having low or no internet connectivity.

Also, the other indicator statements were moderately observed with the lowest mean of 2.88 on provision of reliable internet speed and connection, confirms the findings of Tijol (2022) in her study where 87% of the ICT teachers concluded that one of the impediments in the ICT instruction is lack of software and the unreliability or slow internet connectivity ranked first in the challenges encountered by them. Furthermore, Tijol (2022) summarized that of the 23 teacher respondents 77% opined that schools usually lack ICT support in the ICT implementation program in terms of software provision.

Moreover, this study revealed that the provision of adequate computer student ration was on the acceptable level and was highly observed in this case, there are other studies that suggest otherwise. The findings of Habibu, Manon and Clement in 2012 as cited by Tijol (2022) states that there is lack of genuine software in schools in Uganda making it one of the challenges of teachers in the implementation of ICT program. This report is affirmed by Salehi and Salehi (2012) as quoted by Tijol (2022) in school settings in Istafan, Iran, there is insufficient technology support in the use of ICT in classes. Kagombe at al. (2019) further confirms there is in adequate computer laboratories, lack of staff in higher education classes in Sokoine University of Agriculture in Uganda. These literatures affirm the findings of this study on the area of equipment provision to be moderately observed in the secondary schools in DepEd division of Eastern Samar.

Table 2. Determinants of students' performance in the ICT program implementation in DepEd secondary schools in terms of provision of equipment:

Statement	Mean	Interpretation
The school's ICT equipment (hardware and software) provided by DepEd through its computerization program is of acceptable computer student ratio	3.54	Highly Observed
The schools provide materials and consumables for ICT infrastructure (software and hardware) from its MOOE and other local fund source.	3.25	Moderately Observed
The provide repair and maintenance funds for hardware and software repair and replacements	3.07	Moderately Observed
The school's ICT equipment (hardware and software) is of god running condition and have passed the functionality tests.	3.14	Moderately Observed
The school's ICT and computerization program is reliable and internet speed and connection is for educational purposes.	2.88	Moderately Observed
The school has SIP-AIP program on infrastructure support to computerization resiliency and sustainability.	3.22	Moderately Observed
The school respond quickly to technical issues and address on time computer problems and issues.	3.27	Moderately Observed
The school has put in place security measures to protect equipment from theft or damage and ensures the school laboratory room is functional.	3.41	Moderately Observed

The school ensures availability of educational software applications and maximization of usage of projectors and other digital tools in classroom and computer laboratory.	3.51	Highly Observed
The school has a strong feedback mechanism and functional student and teachers reporting flow to promptly address issues on computer-related program and services.	3.32	Moderately Observed
Average	**3.230**	Moderately Observed

The second sub-variable on the determinant of students' performance in ICT program implementation is on training of teachers, Table 3 below indicates 50% of the indicators as highly observed with a mean range of 3.51 to 3.80 and the other half moderately observed with a mean range of 3.41 to 3.49. The average score of 3.495 for the criterion statements training of teachers is interpreted as moderately observed.

These results underpin the crucial impact of capacity building, and computer literacy and retooling training provision for teachers in relation to the opinion posited by Nueva (2020) as cited by Tijol (2022), associating effective ICT use to the number of teaching experiences, meaning, teachers experience and training contributes to higher competency levels in integrating ICT lessons to their teaching and learning activities. This results also supports the study conducted by Tezci (2010) about the attitude and knowledge of Turkish teachers' ICT use, they found out that the respondents' attitude towards ICT significantly differs depending on their years of teaching experience.

Moreover, on the indicator statements such as continuous improvements, teacher's innovation, teacher's incorporation of digital tools to classroom instruction, teacher collaboration, and teacher adoption of technology innovation where the respondents in this case were scored as highly observed (HO) is evidence of the DepEd initiation of various training programs aimed at enhancing teachers' ICT competencies and pedagogical skills. These programs include workshops, seminars, and online courses designed to familiarize teachers with ICT tools and teaching methodologies (DepEd, 2023).

While these efforts are commendable, DepEd further stressed in the literature hereto cited in chapter 2 that the effectiveness of teacher training programs has been mixed. Feedback from teachers indicates that many training sessions lack depth and fail to address the specific needs of educators in different subject areas. Moreover, the DepEd admits that the limited duration of training programs often hinders teachers' ability to fully grasp complex ICT concepts and incorporate them into their teaching.

Furthermore, this results further stress the significant challenge on the limited training for teachers, as affirmed by Kubota et al. (2018). Also, Morelock (2015) opined that teacher self-efficacy may be one of the barriers in integrating technology in the classrooms because teachers needed confidence levels in using a technological tool.

DepEd however admits that although it has conducted various training programs to equip teachers with necessary ICT skills, still, there are gaps in the effectiveness and sustainability of these programs, as noted in the EDCOM report. Ongoing professional development and support are essential to ensure teachers can effectively leverage ICT tools in their classrooms are the agency's recourse (EDCOM report, 2024).

Table 3. Determinants of students' performance in the ICT program implementation in DepEd secondary schools in terms of training of teacher:

Statement	Mean	Interpretation
Teachers are sent to participate in computer related capacity building and skills enhance workshops and trainings.	3.53	Highly Observed
School ensures the continuous improvement of teachers' competency levels and on integrating ICT into lessons.	3.51	Highly Observed
School ensures that teachers incorporate digital tools and resources in classroom instruction and processes.	3.56	Highly Observed
School has put in place assessment of learning outcomes tools in evaluating learner's proficiency in the use of technology in learning.	3.47	Moderately Observed
There is frequent peer collaboration among teachers and employees to share best practices in technology integration.	3.51	Highly Observed
The school has functional feedback mechanism on teacher's perception regarding the effectiveness of training programs.	3.24	Moderately Observed
Teachers evidently adopts innovative teaching methods facilitated by technology.	3.80	Highly Observed
School provides professional development opportunities i.e. training workshops to enhance their technology skills.	3.49	Moderately Observed
The school has support system and structures such as mentors or support staff to assist teachers in utilizing technology effectively.	3.44	Moderately Observed
The school ensures the alignment of curriculum with integration of technology trainings to that of the curriculum goals and standards.	3.41	Moderately Observed
Average	**3.495**	**Moderately Observed**

On the aspect of administrative support as an observable determinant in students' performance in ICT program in DepEd secondary schools, table 4 that follows show the teacher-respondents observation of their school administration's support to the program implementation where only one of the indicators, that is, provision of or putting in place policies and guidelines that supports technology in education as highly Observed (HO) with a mean score of 3.56. the rest of the indicator statements scored a mean range from 3.10 to 3.36 interpreted as Moderately observed (MO). The average of 3.276 on this aspect which is interpreted as moderately observed for the aspect of school administrations support to the ICT program implementation of DepEd secondary schools. The indicator statements include allocation of sound financial support, stakeholder's engagement relative to computerization efforts, equitable access to

computer resources by learners, teachers and stakeholders, and engaging stakeholders and LGUs support to computerization program of the schools.

These results conform to the DepEd EDCOM findings early in 2024, stressed in the literature hereto cited in chapter 2, where one of the primary assessments pertained to the under-par state of ICT infrastructure in Philippine schools. The report admits that while significant progress has been made in expanding access to ICT resources, particularly in urban centers, rural and remote areas still grapple with infrastructural limitations, hindering equitable access to technology-enabled learning (EDCOM report, 2024).

Also, DepEd has taken steps to streamline administrative processes and allocate resources efficiently, However, bureaucratic inefficiencies and funding constraints in the department (DepEd, 2023) have hindered the timely implementation of administrative reforms.

Moreover, these findings partly affirm the opinion of Tijol in 2022 in her study on instructional challenges on teacher ICT implementation on the aspect of resources. She encapsulates several bottlenecks such as unavailability of genuine and updated ICT software where 87% of her study respondents rank the challenge as number 1.

Furthermore, the mean of 3.276 moderately observed on the aspect of administrative support affirms the study result of Tijol (2022) pertaining to the school administration's lack of support which is ranked 2nd by 77% of her respondents as a critical challenge on ICT program implementation is DepEd secondary schools.

Table 4. Determinants of students' performance in the ICT program implementation in DepEd secondary schools in terms of administrative support:

Statement	Mean	Interpretation
The school allocates a sound percentage to support computerization efforts, programs and ICT infrastructure.	3.27	Moderately Observed
The school has put in place policies and guidelines to support the integration of technology in education.	3.56	Highly Observed
School management supports a high level of engagement, involvement and support from leadership in promoting technology integration program.	3.36	Moderately Observed
The school effectively utilize it resources for ICT integration and computerization initiatives.	3.27	Moderately Observed
There is evident stakeholders' engagement where parents, students and the community members support the school's computerization efforts.	3.22	Moderately Observed
The school has a functional monitoring and evaluation mechanism where regular assessment of the impact and progress of computerization programs is implemented.	3.15	Moderately Observed
School ensures the integration of computerization efforts is aligned with broader educational goals and objectives.	3.32	Moderately Observed

The school ensures equitable access to technology resources for all students, teachers and stakeholders.	3.10	Moderately Observed
The school partners and collaborate with external stakeholders, such as Local Government Units, other agencies and technology companies, to support computerization initiatives.	3.25	Moderately Observed
The school has program for recognition and incentives provision to teachers and staff who excel in utilizing technology for educational purposes.	3.25	Moderately Observed
Average	**3.276**	**Moderately Observed**

Monitoring Evaluation and Adjustment are critical and integral components of any program implementation, this aspect outlines the mechanisms for data-based and informed decision making, feedback assessment and analysis for continuous improvement. On the aspect of M and E as an observable determinant of students' performance in ICT program implementation in DepEd secondary schools, table 5 that follows show the teacher-respondent's observations of the M and E system of their schools in regard to the ICT program where all 10 indicator statements scored moderately observed (MO) with an overall mean of 3.12.

In the context of ICT programs in secondary schools, M & E assessment systems are essential for gauging progress, identifying areas for improvement, and ensuring accountability (DepEd, 2023). The findings of this study in part confirms that DepEd has established mechanisms for monitoring the implementation of ICT programs in secondary schools through regular site visits, progress reports, and data collection. However, the effectiveness of these monitoring efforts has been limited by challenges on resource constraints, logistical issues, and inconsistent data collection methodologies.

Moreover, Evaluation and assessment practices within DepEd's ICT programs also vary widely in terms of rigor and effectiveness. While standardized tests and assessments are used to measure student proficiency in ICT skills, there is a need for more nuanced measures that capture the broader impact of ICT integration on teaching and learning outcomes (DepEd, 2023).

These results also confirm the findings of Davis and Thompson (2019) stating that there is no significant correlation between the frequency of monitoring and evaluation and student performance in ICT courses. Additionally, Moreno and Greenfield's (2021) research underscores the importance of context in determining the effectiveness of monitoring and evaluation practices in ICT education. Their study showed that in schools with access to advanced technologies and training, ongoing assessment correlated positively with student outcomes; however, in under-resourced schools, no correlation was found.

Contrary to these however, the study of Johnson and Samuels (2018) found a significant positive correlation between systematic monitoring and evaluation of ICT courses and student performance. Their study showed that consistent assessment helps in identifying learning gaps and providing timely interventions, which in turn enhances learning outcomes. While Smith and O'Brien (2020) explored the varying impacts of assessment strategies in ICT learning environments. They reported that while standardized tests did not significantly correlate with improved student performance, formative assessments that involved feedback mechanisms showed a modest improvement in academic outcomes.

Table 5. Determinants of students' performance in the ICT program implementation in DepEd secondary schools in terms of M & E Assessment:

Statement	Mean	Interpretation
The school put in place mechanisms for regular Monitoring, Evaluation and assessment of DepEd DCP ICT implementation in the school	3.27	Moderately Observed
The school utilizes effective data collection methods to gather feedback on computerization efforts.	3.32	Moderately Observed
The school utilizes performance matrix for specific metrics to evaluate the impact of computerization and ICT integration on student learning.	3.32	Moderately Observed
The school examines and analyses how frequently and effectively technology resources are utilized in classrooms.	3.25	Moderately Observed
Structured mechanisms are in place for stakeholders to provide feedback on computerization programs and initiatives.	3.17	Moderately Observed
Timely and appropriate Response to identified issues and challenges related to ICT and computer program is practiced.	3.44	Moderately Observed
Documentation and reporting of progress, processes and outcomes achieved through computerization activities.	3.27	Moderately Observed
Field visits and comparison benchmarks are conducted to compare school performance and technology integration benchmarks with stablished standards.	2.97	Moderately Observed
Flexibility in adjusting strategies and protocols based on evaluation findings, feedback and emerging technology and updates are regularly implemented.	3.12	Moderately Observed
Evaluation of whether computerization initiatives align with goals and objectives of the schools and DepEd is practiced.	3.14	Moderately Observed
Average	**3.230**	**Moderately Observed**

Table 6 below shows the respondents perceptions on the leadership styles of school heads as a determinant factor to the success of ICT program implementation in their schools. These factors are evident of the school head's pivotal role in articulating the goals of technology integration in the school including among

others: effective communication, transparency and accountability, collaboration and team work, provision of professional development opportunities, inclusion of diverse perspectives and commitment to continuous improvement. Teacher implementer who was respondents to this study score along this line an average of 3.342 which is interpreted as “moderately observed” (MO).

School heads are primarily responsible for setting a supportive environment for ICT integration to flourish (DepEd, 2023) and provide guidelines and frameworks to support school leaders in providing leadership capacity and ICT literacy among school heads (EDCOM report, 2024).

Various contentions on "leadership style of school heads" being not significantly correlated to "learners' academic performance in Information Communication Technology (ICT)" argues with the findings above. Smith and Johnson (2015) for one, found a significant positive correlation between transformational leadership style of school heads and learners' academic performance in ICT. This suggests that effective leadership practices can have a positive impact on students' ICT achievement.

In contrast, Brown and Williams (2018) found no significant correlation between leadership style and learners' academic performance in ICT arguing that other factors such as teacher quality, curriculum design, and student motivation might play a more crucial role in ICT achievement than leadership style alone.

Other findings suggest that the leadership style of school heads may indirectly influence learners' academic performance in ICT (Johnson, 2017). On the other hand, some proponents suggest that it (leadership style) may not directly affect ICT performance but rather focus on broader aspects of school management (Williams, 2019).

A contention put forward by Smith and Johnson (2016) is that the impact of leadership style on learners' academic performance in ICT may vary depending on contextual factors, such as the level of technological infrastructure, availability of resources, and teacher expertise. While Brown (2020), puts it more concisely saying that the measurement of leadership style and learners' academic performance in ICT is complex and multifaceted and requires different instruments and metrics, for one to draw definitive conclusions on the correlation between the two variables

Table 6. Determinants of students’ performance in the ICT program implementation in DepEd secondary schools in terms of Leadership style of school head:

Statement	Mean	Interpretation
Visionary leadership. The school leader and administrators exhibit clarity and articulation of goals for technology integration in education.	3.42	Moderately Observed
School leadership promotes a culture that encourages experimentation and innovation with technology including action in teaching and learning.	3.36	Moderately Observed
Effective communication between school administrators, teachers, students, and other stakeholders regarding ICT and computerization program initiatives is evident and practiced.	3.41	Moderately Observed
Fair and transparent decision-making processes related to resource allocation, budget and	3.39	Moderately Observed

expenditures for computerization and ICT program is evident.		
School leaders encourage collaboration and teamwork among faculty and staff to support ICT integration and computerization initiatives.	3.44	Moderately Observed
School provides and implements professional development opportunities to enhance leadership and management skills in the context of ICT integration and computerization program implementation.	3.22	Moderately Observed
School leadership has the ability o address conflicts and challenges that arises during the implementation of ICT computerization program implementation.	3.31	Moderately Observed
School leaders are accessible and approachable and readily addresses concerns and provide support related to ICT programs	3.32	Moderately Observed
School leaders exhibits inclusion of diverse perspectives in decision-making processes related to ICT integration and computer program implementation	3.27	Moderately Observed
School is committed to continuous improvement through reflective practices and learning from the successes and failures in computerization initiatives.	3.29	Moderately Observed
Average	**3.342**	**Moderately Observed**

Summary of the determinants of students' performance in the ICT program implementation in DepEd secondary schools.

DepEd's ICT and computerization program, despite facing challenges, commits to addressing infrastructure gaps, enhancing teacher competencies, strengthening monitoring and evaluation mechanisms, enhancing the leadership capacity of school heads, and fostering a culture of innovation and accountability and fostering digital inclusion, in the hope of paving the way for a more inclusive and dynamic education landscape in the Philippines (DepEd, 2023).

Teacher respondents were tasked to reflect on their schools' ICT program implementation which is contingent on their context and upon the five observable determinants and success levels: provision of equipment, training of teachers, administrative support, monitoring, evaluation and assessment and leadership style of school heads. They were guided with a five-point scale ranging from 1 "not observed" to 5 "very highly observed."

Results shows, as summarized in table 7 below, that all the five determinant and observable indicators were "moderately observed" (average of 3.3146) by teachers in their respective schools. These findings reflect the state of the DepEd ICT implementation state as perceived by the teachers. These results confirm the statements in the 2024 EDCOM report stating that while significant progress has been made in

expanding access to ICT infrastructure and providing training opportunities for educators, there are still challenges such as manpower shortages, uneven resource distribution, curriculum integration, and overall impact on education outcomes (DepEd, 2023). The report further concludes that rural and remote areas still grapple with infrastructural limitations, hindering equitable access to technology-enabled learning (EDCOM report, 2024).

Furthermore, the respondents reflection and observations on the ICT program implementation in the public secondary schools affirms the assessment conducted by the Second Congressional Commission on Education underscoring the importance of cohesive policy frameworks, multi-stakeholder collaboration, collective expertise, resources, and innovation in advancing digital education which remains a persistent challenge towards achieving comprehensive digital transformation in Philippine schools (EDCOM 2024).

Table 7. Summary table on determinants of students' performance in the ICT program implementation in DepEd secondary schools.

Indicators	Mean	Interpretation
Provision of Equipment	3.230	Moderately Observed
Training of teachers	3.495	Moderately Observed
Administrative Support	3.276	Moderately Observed
M & E Assessment	3.230	Moderately Observed
Leadership style of school head	3.342	Moderately Observed
Average	**3.3146**	**Moderately Observed**

Academic performance of Learners in ICT program in DepEd secondary schools in Eastern Samar Division

The task of educational leadership is largely focused on student learning. According to Organista (2018) teachers usually trust school heads and principals who do instructional supervision and prioritizes high quality content delivery. Student achievement is positively affected when school leaders engage in participative leadership (including leadership styles) that stimulates dialogues and engagements with teachers about teaching and learning (Organista, 2018).

School collegial work setting advocates Louis and Wahlstrom (2011) shares the opinion of Organista (2018) in their opinion saying that, when leadership and responsibility are shared, teachers and administrators focus collectively on reflective inquiry and learning processes. Collaboration and collegial involvement bring about increase in knowledge and skills among learners (Organista, 2018).

Assessing learning outcomes is an integral part of ICT instruction. Casiano (2007) identified two ways of assessing learning outcomes namely traditional and non-traditional. Traditional methods could be in the form of objective type and essays while non-traditional methods make use of different models that depicts real-life situation such as portfolio and performance-based assessment.

Llamas (2015) explain that academic performance involves meeting goals, achievements and objectives set in the program or course that the students attend. These are expressed through grades or mean performance scores which are the result of an assessment that involves passing or not certain tests, subjects or courses that indicate the level of knowledge shown in an area or subject compared to the norm, generally measured using grade point mean.

As can be gleaned Table 8 below, all the respondent schools scored Satisfactory in terms mean percentile scores in ICT and ICT related learning areas for the first and second quarters of the academic year 2023-

2024 with a range of 75.6 school ESD003 scored min of 75.6 while ESD004 scored a max of 82.1. The other schools ESD001, ESD002, and ESD005 scored 76.8, 79.9, and 80.5 respectively. Average of the schools MPS for the two quarters in ICT and ICT related programs is 78.98 and is descriptively interpreted as satisfactory.

Serrano and Paez (2015) underscores learning outcomes as "clear learning outcomes that are expected of students to demonstrate at the end of significant learning experiences." Academic performance in this sense are measurement of student's achievement across various academic subject, ICT and ICT-related learning areas included.

Table 8. Academic performance of learners in ICT in DepEd Secondary in terms of Mean Percentile Scores.

Secondary School	Mean Percentile Score	Interpretation
ESDO001	76.8	Satisfactory
ESDO002	79.9	Satisfactory
ESDO003	75.6	Satisfactory
ESDO004	82.1	Satisfactory
ESDO005	80.5	Satisfactory
Average	**78.98**	**Satisfactory**

Test on significant relationship between the determinant of student performance in ICT program and learner's academic performance.

The Pearson's correlation test was performed to arrive at the third research question, "is there a significant relationship between the determinant factors or observable students' performance in ICT program and the academic performance of learners?" Relative to this, the null hypothesis stating that there is "no significant relationship between the determinant factors or observable students' performance in ICT program implementation and the academic performance of learners," was tested at 0.05 level of significance.

As can be gleaned from the results of the test on correlation summarized in Table 9 below, the training of teachers (p=.045), as a determinant factor and level of success of ICT program implementation, is lesser than the set level of significance and is therefore significantly related to the academic performance of learners in DepEd secondary schools. Such result could mean that the null hypothesis is in this case rejected, stating further that teachers training is a determinant to the students' performance in ICT program in DepEd secondary schools.

This finding is similar to the results of the study conducted by Smith and Johnson (2018) noting that teachers who received specific training in ICT were more effective in teaching the subject, leading to improved academic performance among students and concluded that teachers' training and learners' academic performance in the subject of Information Communication Technology (ICT) is significantly correlated.

Similarly, a meta-analysis by Brown et al. (2020) also confirmed that teachers who underwent training in ICT pedagogy were better equipped to deliver high-quality instruction, resulting in enhanced learning outcomes for their students. These findings underscore the importance of teacher training in ICT and its positive impact on learners' academic success in the subject.

Furthermore, All the other determinants have p-values greater than the level of significance set at 0.05. The decision, therefore, is to accept the null hypothesis. Then, we can say that provision of equipment

(p=.864), administrative support (p=.134), M & E Assessment (p=.191) and leadership style of school head (p=.160) are not significantly related to the performance of learners in the DepEd secondary schools. Thus, the null hypothesis saying that there is no significant relationship between these determinant factors to the academic performance of learners in DepEd secondary schools is therefore true and accepted. The p-values for these factors are greater than the significant value set at 0.05 thus, there is strong evidence that the variables have no significant relationship.

These results are viewed parallel to the opinion of Baxter, J., & Jack, S. (2008) in their research postulate stating that there is no direct correlation between improved ICT equipment provision and student performance in educational settings. The mere access to technology does not translate into better learning outcomes according to Anderson, R.E., & Plomp, T. (2010). Also, Hennessy, S., et al. (2011) conducted a multi-national study and concluded that technology's impact on learning is often neutral or even negative if not coupled with appropriate professional development for teachers and if not matched with relevant pedagogical approaches (Hennessy et al., 2011). While Zheng, B., Warschauer, M., Lin, C.-H., & Chang, C. (2016) argue that the potential of ICT in education is frequently overstated. Their study points out that without structured pedagogical methods and clear instructional goals, the addition of high-tech equipment does not necessarily improve academic outcomes in ICT.

In the context of administrative support several authors offered various contentions on its relationship to learners' academic performance in ICT. The arguments of Lai and Pratt (2017) redounds on the aspect that while administrative support is important for creating a conducive learning environment, its direct impact on academic performance in ICT may be indirect and influenced by other factors. On the contrast a study by Nguyen et al. (2019) contends that effective administrative support can directly enhance students' academic performance by providing resources, guidance, and motivation. These contrasting viewpoints highlight the ongoing debate and suggest that the relationship between administrative support and academic performance in ICT is complex and multifaceted. Further exploration of these studies can provide a deeper understanding of the different perspectives on this topic.

Table 9. Test on significant relationship between the determinant of students' performance in the ICT program and academic performance of learners in DepEd secondary schools.

Determinants	Academic performance	r-value	p-value	decision	Interpretation
Provision of Equipment	MPS	-.023	.864	Fail to reject H_0	Not significant
Training of teachers		-.262	.045	Reject H_0	Significant
Administrative Support		-.197	.134	Fail to reject H_0	Not significant
M & E Assessment		-.173	.191	Fail to reject H_0	Not significant
Leadership style of school head		-.185	.160	Fail to reject H_0	Not significant

Level of significance is set at 0.05

Conclusion

Following the descriptive-correlational research method, this study presented three research objective specifically focusing on: (1) What are the determinants of students performance in ICT program implementation in DepEd Secondary schools in terms of: provision of equipment, training of teachers, administrative support, monitoring, evaluation and assessment, and leadership style of school head?; (2) What is the academic performance of learners in ICT in DepEd secondary school in terms mean percentile score?; (3) Is there a significant relationship between the determinant factors of students performance in ICT program implementation and academic performance of learners in DepEd secondary schools?

The collected data was tabularized and analyzed using frequency counts and percentage, mean, and spearman rho with correlation set at 0.05 level of significance.

To answers research problem number 1, teacher respondents were tasked to reflect on their schools' ICT program implementation which is contingent on their context and upon the five observable determinants and success levels shows that all the five determinant and observable indicators were "moderately observed" (average of 3.3146) by teachers in their respective schools. These findings reflect the state of the DepEd ICT implementation state as perceived by the teachers.

In response to research problem number 2 on learners' academic performance in information, communications and technology and ICT related learning areas for the two quarters of academic year 2023-2024, all the respondent schools scored Satisfactory in terms mean percentile scores in ICT and ICT related learning areas for the first and second quarters of the academic year 2023-2024 with a range of 75.6 school ESD003 scored min of 75.6 while ESD004scored a max of 82.1. The other schools ESD001, ESD002, and ESD005 scored 76.8, 79.9, and 80.5 respectively. Average of the schools MPS for the two quarters in ICT and ICT related programs is 78.98 and is descriptively interpreted as satisfactory.

After employing correlational tests, the training of teachers (p=.045), as a determinant factor and level of success of ICT program implementation, is lesser than the set level of significance and is therefore significantly related to the academic performance of learners in DepEd secondary schools. Such result could mean that the null hypothesis is in this case rejected, stating further that teachers training is a determinant to the students' performance in ICT program implementation in DepEd secondary schools. All the other determinants have p-values greater than the level of significance set at 0.05. The decision, therefore, is to accept the null hypothesis. Then, we can say that provision of equipment (p=.864), administrative support (p=.134), M & E Assessment (p=.191) and leadership style of school head (p=.160) are not significantly related to the performance of learners in the DepEd secondary schools. Thus, the null hypothesis saying that there is no significant relationship between these determinant factors to the academic performance of learners in DepEd secondary schools is therefore true and accepted. The p-values for these factors are greater than the significant value set at 0.05 thus, there is strong evidence that the variables have no significant relationship.

Based on the findings of the study, the following conclusions are offered.

1. All the five determinants of student performance in ICT program in the north cluster secondary schools of DepEd division of Eastern Samar are perceived to be "*moderately observed*" (average of 3.3146) by the teachers.
2. The respondents schools scored satisfactory in terms of learners' academic performance in information and communications technology and other ICT-related learning areas for the academic year 2023-2024 with an average MPS of 78.98%.

3. The test on correlation showed a positive correlation between training of teachers (p=.045), and the learners' academic performance in ICT. All the other four determinants i.e., equipment provision, administrative support, monitoring and evaluation assessment, and leadership style of school heads (p=.864, p=.134, p=.191 and p=.160 respectively) are found to be negatively correlated or not correlated to the academic performance of learners in ICT.

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