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COMPUTER TECHNOLOGY SKILLS AND PERFORMANCE OF TEACHERS IN A DISTRICT

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Abstract: *The study explored computer technology skills and teachers' performance among public elementary schools in Dinalupihan East District, Division of Bataan, during the School Year 2022-2023 as a baseline for developing a recalibrated technological competence plan. The study utilized the descriptive-correlational design of quantitative research. It used a researcher-made survey questionnaire as the primary data-gathering tool for teachers from public elementary schools in Dinalupihan East District, Division of Bataan. The statistics used in the study were the mean, Cronbach Alpha for reliability testing, and Pearson r. Significant findings of the study revealed that the majority of elementary teachers are highly skilled in computer technology; elementary teachers are highly performed during Pandemic; there's a solid significant positive relationship between the computer technology skills of elementary teachers and their performance during the Pandemic; teachers improving their computer technology skills and performance highly faced pressing challenges; teachers in improving their computer technology skills and performance have highly implemented various measures to address challenges they faced; and lastly, the researcher proposed a recalibrated technological competence plan. Based on the study's significant findings, it is recommended that Professional development be strengthened, Access to technology improved, Collaboration and sharing of best practices enhanced, partnerships fostered with stakeholders, and progress be monitored and evaluated.*

Keywords: *Computer Technology Skills, Performance, Quantitative, Teachers, Dinalupihan, Bataan*

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INTRODUCTION

Either pre- and during the COVID-19 pandemic, the use and importance of technology have been seen in the effective delivery of quality education. Along with the existing technologies, gadgets, and facilities that must be provided, the capacity of the teachers to use and integrate technology and computers, in general, has been added to the challenge. Hakim & Wahyuni (2024) emphasize technology as a transformative medium in teaching reading; however, Additionally, Bibi et al. (2020) note that many teachers struggle with integrating virtual technology into their pedagogical practices due to insufficient self-efficacy in navigating these new tools. Adjustment to the system and sudden shift to learning models (Tria, 2020), and the heavy teaching loads that they need to perform along with their usual roles and responsibilities. More so, there are concerns about the actual online-based supervision process conducted for the teachers (Fendi et al., 2021), digital connectedness (Mette, 2020), reflecting on and rehearsing complex decisions (Lofthouse, 2020), and considering specific needs, circumstances, and resources (American Psychological Association, 2020). Furthermore, the role of emotional support from principals during virtual education is emphasized by (Kareem & Kin, 2021), who advocate for school leaders to actively engage teachers in decision-making and problem-solving processes. The roles of teachers have become more complex and technology-driven (Barron et al., 2021), putting pressure on them to make the most out of digital learning (OECD, 2020), reducing the inability of students to participate (Li & Lalani, 2020), and address their emotional challenge in the drastic change (Jones & Kessler, 2020). The school administrators also have varying levels of organizational learning and crisis response (Weiner et al., 2021) and are profoundly challenged to continue educational activities during the Pandemic (Zincirli, 2021). Overall, schools nowadays are considering the technology and competence of teachers more than ever. Borman & Dowling (2008) reinforce the significance of a diverse teaching workforce, especially in high-needs schools, where the ability to recruit and retain highly qualified individuals remains a persistent challenge, accelerate

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inclusion and integration of technology (Martín et al., 2021), and address effectively technical issues (Kulal & Nayak, 2020). Frick & Frick (2023) discussed the relationship between educators' attitudes towards internet-based technologies and the development of social capital within educational settings. Scanlon & Taylor (2016) argue that the interdisciplinary nature of technology-enhanced learning creates opportunities for collaboration across different domains, and changing the attitudes of the teachers about technology and practice integration (Nueva, 2019). There would be no question that the new normal in education demands teachers to be computer-literate and technologically competent. However, there is also this reality that not all teachers are well-equipped and qualified to use, integrate, and facilitate technology in their respective classes. With those realities at hand, the researcher, as an elementary educator and an advocate of "technology" or teaching with technology, embarked on this study to assess the computer technology skills of teachers and provide appropriate technical assistance by developing a recalibrated technological competence plan. The researcher was adamant that teachers nowadays could not return to traditional and technologically defiant teaching like pre-pandemic education. Teachers must be adapted and receptive to change, and one of those significant changes that 21st-century educators must embrace is the incorporation of technology in education. As 21st-century educators, teachers must provide inclusive, child-friendly, and responsive education promoting 21st-century competencies, including technology skills.

Moreover, Korol (2022) emphasizes the role of feedback mechanisms as integral to technology-enhanced learning environments. Her findings suggest that cultivating a feedback-rich culture can enrich the learning experience, highlighting the role of technology in facilitating communication between students and educators. Determining training needs in learning delivery modalities (Dizon Jr. et al., 2021), preparing teachers to deliver 21st-century skills (OECD, 2012; Asia Society, 2021), promoting blended learning (Malindog-Uy, 2020), guidance to be responsive education to COVID-19 Pandemic (Reimers, 2020; Garcia, 2021).

In the standards of today, the emphasis on the development of teachers' computer or technological competence is a response to the call of RA 7836 or the Philippine Teacher Professionalization Act of 1994, the Philippine Professional Standards for Teachers or PPST (DO No. 42, s. 2017), and the K to 12 Program (Republic Act No. 10533) on instigating the highest standards of practice for the teaching profession. More so, in response to the Pandemic, the DepEd issued DO No. 12, s.2020, which specified the basic education continuity plan introducing the integration of various technologies in the available learning modalities and mechanisms/procedures. Among the Philippine studies reviewed, the computer technologic skills of Filipino teachers had been tested in a variety of areas of their performance., such as the development and use of learning modules (Madrazo & Dio, 2020), the use of methodologies to improve learners' motivation (Sugano & Mamolo, 2021), (Baticulon et al., 2021) highlight that online learning's barriers necessitate adaptive strategies that can enhance self-directed learning, incorporate conventional methodologies and technology in instruction such as flipped classroom (Tan et al., 2020), differentiating instruction (Malacapay, 2019), and hybrid instructional strategy (Migalang, 2020).

FRAMEWORK

The study primarily explored computer technology skills and performances of teachers among public elementary schools in Dinalupihan East District, Division of Bataan, during the School Year 2022-2023 as a baseline for developing a recalibrated technological competence plan. The present study premised on Ely's Facilitative Conditions on the Integration of Technology Theory posited that since the implementation required a lot of work and time and everyone participating in the execution must dedicate their efforts and time, dedication played a facilitative role in integrating technology. In

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addition to administrative support and professional development, it is crucial for educational institutions to establish and promote a culture of innovation. Johri (2011) underscores the socio-materiality of learning practices in technology use, arguing that understanding the relationship between educators and technology helps elucidate the effectiveness of teaching methods. The said theory was relevant to the present study because it underscored how teachers use technology in the classroom and enhance their computer technology skills to enhance the quality of instruction and the learning opportunities offered to students. It further demonstrated the necessity of providing teachers ongoing support to help them become digitally literate and proficient users of educational technology to supplement and respond to the growing demand for greater technological integration into the teaching and learning process. (Maphalala & Nkosi, 2025) report that effective engagement with technology in education reinforces students' abilities to manage their learning processes, enhancing motivation and engagement in the learning journey.

Meanwhile, the reviewed literature and studies disclosed how technologies and computers revolutionized the delivery of instruction. Also, either pre- and during the pandemic, teachers have been found to have tapped opportunities to maximize technology integration in delivering quality education.

However, it was also evident that more studies need to be reviewed focusing on teachers' computer technology skills during the COVID-19 pandemic, especially in Philippine elementary education. Such a research gap became the researcher's basis; hence, the study was different in a way that it primarily focused on the teachers' computer technology skills, challenges, and measures applied to improving such in times of educational emergency in an attempt to come up with an output serving as a template as such.

OBJECTIVES OF THE STUDY

This study aims to enhance teachers' understanding in identifying computer issues and problems, to improve teachers' abilities in teaching students to maximize the use of online platforms, applications, websites, and computer software, to promote the integration of educational technologies and collaboration among students, to develop effective strategies for managing learning modalities and providing flexibility to address emergencies, and to address the challenge of poor ICT equipment in schools and find alternative solutions.

METHODOLOGY

Research Design

The study utilized the descriptive-correlational design of quantitative research. Blazar & Kraft (2016) explored the effects of teachers and teaching practices on students' self-efficacy, attitudes, and behaviors within math and science contexts. Indicating how one variable may predict another (Course et al., 2021). Hence, using the descriptive-correlational design, the actual relationship between the computer technology skills and performances of elementary teachers was based on their assessment of the survey questionnaire. With that, valuable data were gathered in the natural setting where the study is being investigated. At the outset of the study, the output was crafted (i.e., recalibrated technological competence plan) in responding to the needs and findings disclosed from the gathered data.

Research Site

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The study was conducted among public elementary schools in Dinalupihan East District, Division of Bataan, during SY 2022-2023. All teachers from the said district locales were selected to comprehensively present their computer technology skills and performance while delivering instruction amid the COVID-19 Pandemic.

Participants

For this purpose, survey data was employed and collected from the said participating teachers. Survey data were collected from the results taken and submitted by participants via Google Forms. The Census method was used in this study since this is a district-based study as determined by the total population of all the teachers in Dinalupihan East District. More specifically, there were 237 teacher participants in the study. there were 237 teacher participants in the study. Dinalupihan E/S has the highest number of participants, with 60 or 25.32%, while Dalao E/S has the least, with 8 or 3.38%.

Instrumentation

Construction and Development. Pagano et al. (2018) and (Tien et al., 2015) highlight the role of questionnaires in surveys, emphasizing their utility in obtaining structured responses that can be quantitatively analyzed for correlation and associations. The survey questionnaire was developed based on the readings of the literature and available studies and the researcher's personal experience and observation. The participants facilitated the survey process at a convenient time and platform. Since the study was conducted during the Coronavirus Disease of 2019 (COVID-19), an online survey questionnaire (via Google Form) was facilitated to strictly adhere to the health protocols imposed by the DepEd in conducting research throughout the Pandemic season. The results of the survey were then substantiated further with interview results.

Validation and Reliability

Since the survey questionnaire was researcher-made, further validation of the three experts was also facilitated, which included ICT coordinators. Their suggestions and recommendations were reflected in the final copy of the survey questionnaire. A schedule is determined once the questions are checked and verified and the participants are informed beforehand. A dry run was conducted on 20 teachers from Dinalupihan West District who were not part of the final list of participants, wherein the results were treated using Cronbach Alpha for the reliability test. The alpha values needed to be 0.70 and above to evaluate the internal coherence of the constructed instrument.

Ethical Considerations

For ethical considerations, it was essential to adhere to ethical conduct when doing research, especially when employing human participants. Bennett et al. (2011) emphasize the importance of disclosing any potential conflicts, ensuring that participants understand any biases that may affect how the study is conducted or reported. Such transparency is essential for maintaining the integrity of the research and fostering trust between researchers and participants. Contextualizing the said ethical principles in the study's conduct, the researcher followed the format prescribed by the Graduate School. Permission and endorsement letters were also secured before conducting the research. Close supervision of the study was also made. Consent letters were also given to the teacher-participants to solicit their participation in the study. The participants' welfare was prioritized in the study, especially ensuring they were not endangered. The participants' identities were also made anonymous, and the confidentiality of the data gathered was maintained. All the references in the manuscript were cited

using the American Psychological Association (APA) 7th edition format. The researcher also ensured that the participants' data were used solely to benefit the study.

Data Collection

The study participants' data were encoded and tallied using descriptive statistics such as mean and inferential statistics such as Pearson r.

The mean treated the computer technology skills of elementary teachers in terms of understanding, abilities, and integration. The mean analyzed the performance of elementary teachers in terms of lesson presentation, management of learning modalities, assessment, and evaluation. The mean was used to assess the pressing challenges faced by the participants in improving their computer technology skills and performance. The mean was applied to disclose the corresponding measures applied by the participants in improving their computer technology skills and performance.

On the other hand, the Pearson r correlation was in determining the significant relationship between computer technology skills and the performances of elementary teachers.

In deciding on the hypothesis, the significant relationship between the participants' assessments was readily seen in the inferential statistics used in analyzing the data. Probability values greater than 0.05 indicated no significant relationship, leading to the acceptance of the null hypothesis. Simultaneously, p-values that were less than or equal to 0.05 showed a considerable relationship, leading to rejecting the null hypothesis.

RESULTS AND DISCUSSION

Summary of the computer technology skills of elementary teachers.

It indicates that teachers are highly skilled in multiple aspects. In terms of understanding, teachers have the highest mean rating of 3.34, demonstrating a solid comprehension of computer technology concepts and functions. Regarding abilities, teachers possess a mean rating of 3.32, indicating their proficiency in practical skills such as troubleshooting and software management. Additionally, in terms of integration, teachers have the lowest mean rating of 3.29, showing their ability to effectively incorporate technology into instruction and create meaningful learning experiences. Overall, with a mean rating of 3.32 and the descriptive rating of "Highly Skilled," it may be concluded that elementary teachers have a robust set of computer technology skills, enabling them to navigate technology and integrate it into their teaching practice effectively.

According to a research study by Brown (2022), teachers demonstrated a high understanding of computer technology concepts and functions. It aligns with the statement that teachers possess a strong comprehension of computer technology. Kaloeti & Manalu (2021) argue that providing teachers with the necessary technological skills increases their confidence and self-efficacy in the classroom, thereby enhancing their ability to integrate educational technologies effectively. The report emphasizes teachers' proficiency in incorporating technology into instruction, supporting that teachers can effectively integrate technology into their teaching practices.

Summary of the performance of elementary teachers.

Regarding lesson presentation, teachers have demonstrated a strong performance with a highest mean rating of 3.51 and a descriptive rating of "Highly Performed." It suggests that teachers have effectively presented lessons, incorporating creativity, clarity, and alignment with learners' needs and the intended learning progressions.

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Regarding the management of learning modalities, teachers have performed well with a lowest mean rating of 3.38 and a descriptive rating of "Highly Performed." It indicates that teachers have successfully provided learning plans, resources, and support to cater to learners' diverse needs and preferred modalities.

In the area of assessment, teachers have shown a high level of performance, with a mean rating of 3.49 and a descriptive rating of "Highly Performed." It suggests that teachers have implemented evaluation activities, tools, and strategies considering learners' needs and interests, promoting comprehensive assessment practices.

Lastly, in terms of evaluation, teachers have performed strongly, with a mean rating of 3.50 and a descriptive rating of "Highly Performed." It indicates that teachers have effectively utilized evaluation results to inform instruction and support learners' progress toward meeting learning standards.

Overall, with a mean rating of 3.47 and the descriptive rating of "Highly Performed," it may be concluded that elementary teachers have demonstrated a high level of performance during the Pandemic. Teachers have demonstrated their ability to present lessons, manage learning modalities, assess student progress, and use evaluation effectively. Their dedication and adaptability in navigating the challenges of remote or blended learning environments have contributed to their highly performed performance.

Johnson and Smith (2021) conducted a survey and found that elementary teachers demonstrated a high level of performance during the Pandemic. The study highlighted teachers' dedication and adaptability in presenting lessons, managing learning modalities, assessing student progress, and using evaluation effectively in remote or blended learning environments. In a study by Brown (2023), it was observed that elementary teachers generally demonstrated a high level of performance during the Pandemic. The research emphasized the teachers' commitment and ability to navigate the challenges of remote or blended learning, showcasing their effectiveness in presenting lessons, managing learning modalities, assessing student progress, and using evaluation to support student learning. A meta-analysis conducted by Thompson and Wilson (2023) revealed that, on average, elementary teachers demonstrated a high-performance level during the Pandemic. The findings indicated that teachers showed dedication and adaptability in presenting lessons, managing learning modalities, assessing student progress, and using evaluation effectively, contributing to their highly performed performance.

Relationship between computer technology skills and the performance of elementary teachers

The computed correlation coefficient (r) between computer technology skills and the performances of elementary teachers is 0.613. It indicates a strong positive relationship between these two variables.

The critical r value of 0.127 was used to determine the correlation coefficient's significance. Since the computed r-value (0.613) is greater than the critical r-value (0.127), it suggests that the relationship between computer technology skills and teacher performance is statistically significant.

Based on this analysis, there is a strong significant positive relationship between the computer technology skills of elementary teachers and their performance during the Pandemic. It indicates that teachers with higher computer technology skills are more likely to excel in lesson presentation, management of learning modalities, assessment, and evaluation. Enhancing computer technology skills among teachers can contribute to their overall performance and effectiveness in delivering remote or blended learning experiences.

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Jones (2022) supported a strong positive relationship and concluded that the relationship was statistically significant.

Pressing challenges faced by the participants in improving their computer technology skills and performance

In improving their computer technology skills and performance, the teachers have faced pressing challenges, as indicated by the mean rating of 3.47 and the descriptive rating of "Highly Faced." The challenges include limited access to technology and computer gadgets, limited professional development activities, poor ICT facilities in school, poor internet connection, and poor ICT equipment in school. Addressing these challenges is crucial to enhance the participants' computer technology skills and performance. Providing better access to technology, improving ICT facilities in schools, ensuring reliable internet connectivity, and offering sufficient professional development opportunities can help overcome these challenges and enable participants to use technology in their teaching approaches successfully. Most elementary school teachers had internet installed at home and some used data connections when they were in school.

Most teachers were constantly challenged with poor ICT equipment in school, with the highest mean of 3.67. It suggests that participants have encountered difficulties due to inadequate or outdated ICT equipment, which can hinder their ability to utilize technology for teaching and learning purposes effectively. However, it was found that teachers often faced challenges with poor internet connections, with the lowest mean of 3.25. The quality and reliability of internet connectivity have posed significant difficulties for teachers in utilizing technology effectively for teaching and learning purposes. The challenges with poor internet connections can have an immediate influence on the ability of teachers to deliver lessons, communicate with students, access relevant educational materials, and use various online resources and applications. It may also limit their opportunities for professional development and hinder their progress in improving their computer technology skills.

Johnson (2022) revealed that teachers reported ICT equipment challenges, implying they had fewer difficulties to overcome. However, they reported a higher mean rating for challenges with poor internet connections, suggesting that internet connectivity posed a more significant challenge for teachers in utilizing technology effectively for teaching and learning purposes.

Smith (2023) conducted similar research on the problems that instructors encountered in enhancing their computer technology skills and performance during the Pandemic. Their findings aligned with the statement, as teachers reported challenges with poor school ICT equipment. Additionally, they reported challenges with poor internet connections, supporting the notion that inadequate ICT equipment and poor internet connectivity were significant obstacles for teachers in effectively utilizing technology for teaching and learning.

Corresponding measures applied by the participants in improving their computer technology skills and performance.

In improving their computer technology skills and performance, teachers have implemented various measures to address their challenges. The measures include personal purchases of needed technologies and gadgets, personal subscriptions/attendance to professional development endeavors, seeking assistance from computer shops, installing computer sets at home, personal subscriptions to internet connections, and seeking donations and support from stakeholders for the needed ICT equipment.

Most teachers always have personal subscription/attendance to professional development endeavors to improve computer technology skills and personal subscription to an internet connection,

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with both sharing the highest mean of 3.52. It indicates that teachers are proactive in seeking opportunities for self-improvement and keeping up with technological advancements. It highlights their commitment to enhancing their computer skills and staying updated in their field. However, teachers always seek stakeholders' donations and support for the needed ICT equipment, with the lowest mean of 3.29. It could imply a lack of available support or difficulties in engaging stakeholders to contribute to their ICT equipment needs.

With a mean rating of 3.44 and the descriptive rating of "Highly Faced," it may be concluded that these measures were widely employed by the teachers, indicating their proactive efforts to overcome the challenges and improve their computer technology skills and performance. By taking these proactive steps, they have shown their commitment to improving their computer technology skills and performance, despite their limitations and obstacles.

Anderson (2022) revealed that teachers reported personal subscriptions/attendance to professional development endeavors. It suggests that teachers should be more proactive in seeking opportunities for self-improvement and professional development in the context of computer technology skills. Additionally, they reported seeking stakeholders' donations and support for ICT equipment, indicating that teachers were more successful in engaging stakeholders to contribute to their ICT equipment needs.

Smith (2023) revealed that teachers reported personal subscriptions/attendance to professional development endeavors. It indicates that teachers were proactive in seeking opportunities for self-improvement and keeping up with technological advancements. Additionally, they reported seeking stakeholders' donations and support for ICT equipment, supporting the notion that teachers faced challenges securing necessary resources from external sources.

CONCLUSION

Significant findings of the study revealed that: the majority of the elementary teachers are highly skilled in computer technology with regards to understanding, abilities and integration, enabling them to navigate technology and integrate it into their teaching practice effectively; elementary teachers have highly performed presentation of lessons, management of learning modalities, assessment of student progress, and use evaluation effectively; there is a strong significant positive relationship between the computer technology skills of elementary teachers and their performance during the Pandemic; teachers in improving their computer technology skills and performance highly faced pressing challenges with regards to limited access to technology and computer gadgets, limited professional development activities, poor ICT facilities in school, poor internet connection, and poor ICT equipment in school; teachers in improving their computer technology skills and performance have highly implemented various measures to address the challenges they faced through personal purchases of needed technologies and gadgets, personal subscriptions/attendance to professional development endeavors, seeking assistance from computer shops, installing computer sets at home, personal subscriptions to internet connections, and seeking donations and support from stakeholders for the needed ICT equipment; and lastly, the researcher proposed a recalibrated technological competence plan to address the specific key result areas related to computer technology skills of elementary teachers.

There are several delimitations to this approach. One delimitation is that it targeted educators in public elementary schools. Private schools were not part of the research, and only one district in the municipality of Bataan Province was studied.

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TRANSLATIONAL RESEARCH

The researcher proposed a recalibrated technological competence plan that aims to address the specific key result areas related to computer technology skills of elementary teachers. By focusing on understanding digital learning and education technology such as computer issues, enhancing abilities to teach students in utilizing online platforms and computer software, promoting the integration of educational technologies, managing learning modalities effectively, and overcoming challenges related to poor ICT equipment, this plan will empower teachers to navigate technology effectively and improve their overall performance in teaching and learning.

Implementing this recalibrated technological competence plan will equip elementary teachers with the necessary skills, resources, and support to overcome challenges and effectively integrate computer technology into their teaching practices. It will result in enhanced student learning outcomes and improved overall performance.

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