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Computer Upskilling Trainings and Teachers' Technological Literacy: Basis for Technological Skills Enhancement Plan

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ABSTRACT

The study is deeply rooted in the Diffusion of Innovation Theory, focusing on educators' adoption of computer upskilling training programs. Everett Rogers' theory offers a comprehensive framework for understanding how new ideas and technologies are embraced, highlighting key factors that impact the adoption process. This research delves into the computer upskilling training and technological literacy of teachers, addressing seven main objectives: profiling respondents, evaluating their level of computer upskilling training, assessing their technological literacy, exploring the relationship between training and literacy, and designing a technology skills enhancement plan. Conducted in the First Legislative Districts of Misamis Oriental, the study surveyed 250 teachers during the 2023-2024 school year. Utilizing a descriptive research design and a custom questionnaire, statistical tools like mean, standard deviations, Spearman Correlation Test, and Kruskal Wallis Test were employed to analyze the data. The findings reveal a high level of technological literacy among educators, particularly in Microsoft Office and social media skills, with room for improvement in areas like video conferencing and graphic design. The study underscores the significance of continuous training and support for educators to boost their technological competencies, recommending tailored professional development initiatives and resources to enhance essential technology skills for effective teaching and learning.

INTRODUCTION

Background of the Study

Education has to go along with the changing times. In today's technology driven era, where technology has become an omnipresent force shaping various facets of our lives, the integration of advanced tools and resources within educational contexts presents both an opportunity and a challenge. This study investigated a pivotal issue confronting educator, the pressing need to augment their technological literacy. This research aimed to unravel the profound impact of such training initiatives on teachers' technological proficiency, serving as the cornerstone for the establishment of comprehensive technology skills enhancement plans. As articulated by Prasetiyo *et al.* (2023), the internet has already revolutionized education, underscoring the urgency for educators to adeptly navigate this transformative terrain.

However, it is crucial to acknowledge that not everyone has access to this revolution, which is leading to concerns about digital exclusion and its potential impact on existing educational disparities. This study examined the realm of technological literacy and computer upskilling pieces of training, with a particular emphasis on evaluating their impact on teachers' technological proficiency levels, serving as a foundational framework for the Technology skills enhancement plan. As outlined in DepEd Order No. 021 s. 2019 one of the components of the 21st Century Skills within the K to 12 Conceptual Framework is related to information literacy, media literacy and technology skills. Essentially, teachers need to improve their skills to meet the required standards and effectively contribute to the program's goals.

As observed, while some teachers may possess basic or advanced technological skills, a significant challenge arises in effectively applying these capabilities in the educational context. This discrepancy arises from the multifaceted demands placed on educators, often leaving them with limited time to create personalized, technology-driven instructional materials tailored to meet the diverse learning needs of their students. As stipulated in RA 4670 and DepEd Memorandum No. 291, s. 2008, in addition to their teaching responsibilities, teachers are entrusted with ancillary duties. Consequently, this resulted in a resource and time constraint that hindered the seamless integration of technology into their teaching practices. On the other hand, some other teachers may have low technological literacy, which might be attributed to a lack of training, considering that some of the computer upskilling trainings are not mandatory.

As educators acknowledge their pivotal role in shaping the educational landscape, a sense of duty emerges to navigate these challenges head-on. Beyond a mere acknowledgment of the existing disparities and uncertainties, teachers are positioned to be proactive agents of change. The essence extends beyond recognizing the hurdles; it calls for a deliberate commitment to upskilling, evolve teaching methodologies, and embrace the transformative potential of technology. As highlighted by Stošić and Mikhailova (2023) in their scholarly work, the proficiency of teachers in digital skills is pivotal in determining the effectiveness of integrating Information and Communication Technologies (ICTs) in the classroom.

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Hence, these programs catalyze professional growth, providing teachers, including the researcher, with the necessary tools and knowledge to seamlessly integrate technology into their teaching practices. This empowerment enables creation of personalized, contextually relevant, and technology-enhanced instructional materials to address diverse student needs. The study aimed to bridge the digital divide and make technology-driven education accessible to all students, regardless of their backgrounds. By amplifying the impact of these trainings, the researcher sought to create a ripple effect that will positively influence the broader educational landscape and, consequently, society as a whole.

LITERATURE REVIEW

Computer Upskilling Trainings

Stošić and Mikhailova (2023) underscore the criticality of teachers' digital competences in successfully integrating Information and Communication Technologies (ICTs) within classrooms. Their work highlights the necessity of empowering educators with the requisite digital skills to leverage the potential of ICTs for enriched learning experiences fully. These researchers found out that modern teachers, who are methodically cultivating their creativity and leadership abilities, need a strong drive to acquire fresh knowledge and continually enhance their proficiency in digital technologies.

In their 2022 study, Lang and Triantoro emphasized the substantial role educators play in imparting technology skills to younger individuals through the utilization of e-learning tools and information and communication technology. This is another persuasive rationale for teachers to participate in training programs.

Within this context, Regional Advisory 98, s. 2023, emerges as a pivotal directive. This advisory provides a comprehensive framework for the implementation of computer upskilling trainings for teachers, recognizing their indispensable role in enhancing educators' technological proficiency. By offering explicit guidelines and recommendations, this advisory serves as a practical tool to ensure that teachers are well-equipped to meet the technological demands of modern education.

Innovation in Education

Educational innovations represent purpose-oriented activities, organizational solutions, systems, processes, or methods employed in educational settings that significantly deviate from established practices. Mykhailyshyn *et al.* (2018) emphasize that these innovations when initially introduced within an institution, aim to enhance operational efficiency and foster organizational development within a competitive environment. Acknowledging this imperative, the Southeast Asian Institute of Educational Training, Inc. (SEAIETI) has designed a targeted training program to equip participants with practical teaching and learning strategies. The program is poised to transcend conventional methods, offering educators valuable tools to enhance their effectiveness in the classroom.

Endorsed by the National Educators Academy of the Philippines (NEAP) in accordance with DepEd Memorandum No. 082, s. 2020, SEAIETI's course stands as a testament to its commitment to quality educational initiatives. This endorsement underscores the program's alignment with national educational standards and reinforces its significance in contributing to the broader landscape of educational innovation. By adhering to the guidelines set forth by NEAP, the training program gains recognition as a reliable and approved resource, ensuring that participants are exposed to innovative strategies and empowered to implement them effectively per established educational frameworks.

Education in the Virtual Environment

In anticipation of the challenges posed by the ongoing global shift towards digital education, online classes were gaining popularity even before the pandemic due to their inherent accessibility (Ellis *et al.*, 2021). This shift has underscored the need for educators to adapt to the virtual environment, emphasizing the importance of effective teaching strategies tailored to online platforms. Recognizing this imperative, the Southeast Asian Institute of Educational Training, Inc. (SEAIETI) has developed a comprehensive training program focused on equipping participants with practical and relevant skills for teaching in the virtual realm. This program responds to the changing landscape of education, ensuring that educators are well-prepared to navigate the complexities of online instruction and deliver quality learning experiences to their students.

Endorsed by the National Educators Academy of the Philippines (NEAP) in accordance with DepEd Memorandum No. 082, s. 2020, SEAIETI's course aligns with national standards and reflects a commitment to advancing education in the virtual environment. The approval from NEAP adds credibility to the program, assuring participants that it meets the stringent criteria set by national educational authorities. As virtual education becomes an integral part of the educational landscape, this training program is a valuable resource, providing educators with the tools to excel in online teaching, foster student engagement, and effectively utilize digital platforms.

TV-Based Instruction (TVBI)/Radio-Based Instruction (RBI)

In the 21st century, societies are immersed in visual stimuli, with numerous daily activities relying on visual procedures. Consequently, education must keep pace with societal advancements and embrace emerging innovations (Nicolaou *et al.*, 2019). TV-Based Instruction and Radio-Based Instruction represent innovative approaches that ensure continuous learning, particularly when traditional in-person instruction is compromised. These modalities leverage the accessibility of television and radio, providing inclusive platforms for delivering educational content to a diverse student population.

Division Memorandum No. 284, issued in 2020, demonstrates a proactive approach to address the educational system's dynamic challenges. The adoption of TV-Based Instruction and Radio-Based Instruction represents a significant stride towards inclusivity and accessibility in educational content delivery. This memorandum not only offers clear directives for the seamless execution of these approaches but also emphasizes the criticality of empowering educators with the tools to adeptly navigate the changing educational landscape. Ultimately, this endeavor plays a pivotal role in ensuring uninterrupted learning experiences for students across varied educational settings.

Information and Communication Technology

With the implementation of the Department of Education Computerization Program (DCP), it becomes imperative for teachers to upskill themselves through ICT trainings. This is essential to ensure they can effectively harness the potential of Information and Communication Technologies (ICTs) in the modern educational landscape. This aligns with the emphasis on technological proficiency outlined in DepEd Order No. 016, s. 2023.

The study of Bayucca (2022) underscores the assertion that teachers are required with technology-related management skills in addition to basic ICT competencies. Bayucca aptly highlights that teachers are not only required to have basic technological skills but also need proficiency in technology-related management. This assertion emphasizes the multifaceted nature of ICT integration in education. Beyond the ability to use digital tools, educators must also possess the skills to manage and leverage technology for instructional purposes effectively. DepEd Order No. 016, s. 2023 provides a comprehensive framework for implementing the DCP, outlining specific guidelines for acquiring and maintaining ICT resources in educational institutions. This directive recognizes the pivotal role of technology in modern education and aims to ensure that schools have the necessary infrastructure to support effective teaching and learning. By adhering to these guidelines, the Department of Education is committed to equipping educators with the tools and resources needed to navigate the digital landscape.

Teachers' Technological Literacy

Teachers' technological literacy stands as a critical measure within educational institutions, representing individuals' ability to effectively engage with and utilize technology for learning and problem-solving (Hassan & Akbar, 2020). This proficiency has gained significant importance in modern education, given technology's pervasive role in academic and professional settings.

Biares' (2021) study provides compelling evidence for the impact of technological skills on teaching practices. It indicates that teachers with robust technological competencies are more inclined to implement curricular changes and seamlessly integrate technology into their classroom instruction. This underscores the pivotal role of technological literacy in empowering educators to adapt to evolving educational landscapes.

Furthermore, technological literacy catalyzes innovative and dynamic teaching methodologies. Educators proficient in technology can leverage diverse digital tools and resources to enrich the learning experience for their students. This fosters a more engaging and interactive learning environment, ultimately preparing students for the demands of a digitally-driven world. As demonstrated by Hassan and Akbar's (2020) and Biares' (2021) findings, technological literacy is critical to modern education. Cultivating technological proficiency among educators is paramount to ensuring the continued success and relevance of modern educational practices in a technology-driven era.

Video Conferencing

According to Torrato *et al.*, in 2021, video conferencing has revolutionized education, providing a flexible and adaptable approach to open and distance learning. This technology-driven mode of instruction has become particularly crucial in situations where physical presence is constrained, allowing educators to reach a wider audience and maintain continuity in learning experiences.

Harmilawati *et al.*'s (2020) study sheds light on the multifaceted impact of video conferencing on teaching and learning. Their research indicates that video conferencing not only serves as a facilitator of instruction but also acts as a catalyst for creativity among educators. Participants in their study highlighted how video conferencing platforms encourage lecturers to explore innovative and imaginative teaching methods. This observation is supported by a separate study, which emphasizes educators need to be creative and inventive when utilizing online platforms like video conferencing. In addition, Harmilawati *et al.* (2020) underscores the impact of video conferencing on educators' creativity and innovation. This proves the importance of teachers being proficient in employing this strategy to facilitate student learning whenever the need arises.

Audio and Video Editing

Bayucca's (2020) sheds light on the critical role of audio and video editing skills in modern education. These competencies empower teachers to craft dynamic and engaging learning materials, ultimately enhancing the overall educational experience for students. The research highlights a notable gap in teachers' knowledge, specifically in harnessing computer applications for video editing. This revelation underscores the urgency of providing targeted training and resources to enhance educators' proficiency in this domain.Identifying this knowledge gap emphasizes the necessity for comprehensive training programs that equip educators with the essential skills for audio and video editing. Such programs can significantly enhance educators' ability to create multimedia-rich content that resonates with students.

Further, this sentiment is mirrored in the research by Movitaria and Shandra (2022), which underscores the positive impact of employing video-based Microsoft PowerPoint media as an alternative teaching tool. Their findings demonstrate that educators who adopt this approach effectively elevate student motivation and learning outcomes compared to those who do not. Incorporating audio and video editing as a dependent variable in this study is of paramount importance. It stands as a critical element in evaluating the influence of these skills on teaching effectiveness and student engagement.

Microsoft Office Skills

Microsoft 365 plays a pivotal role as a dependent variable in this study, focusing on its utilization among educators for instructional purposes. Hasanah and Dewi's (2022) research highlights a significant finding - not all teachers are well-versed in using this application. This underscores the need for comprehensive guidance and training to enable educators to effectively harness Microsoft Office 365 and create engaging and innovative educational materials.

DepEd Misamis Oriental's proactive step, as outlined in Division Memorandum No. 054, s. 2023, to adopt Microsoft 365 signifies the recognition of its potential impact on enhancing educational practices. This adoption signifies a commitment to equipping educators with digital tools to facilitate more effective and engaging learning experiences. By integrating Microsoft 365 into the educational framework, the department aims to empower teachers with the capabilities to create dynamic content and adapt to the evolving educational landscape.

The findings from Hasanah and Dewi's study, coupled with the strategic move by DepEd Misamis Oriental, converge to emphasize the importance of Microsoft 365 in the realm of education. It serves as a catalyst for teachers to transcend traditional instructional methods and explore innovative approaches to teaching. By affording educators the opportunity to master this tool, they can leverage its features to craft meaningful learning materials tailored to the diverse needs of their students. This, in turn, has the potential to elevate the overall quality of education within the region.

Graphic Design

Graphic design emerges as a crucial dependent variable in this study, focusing on its impact on educators' roles as lifelong learners and the enhancement of students' academic performance. Pentury and Anggraeni's (2022) research emphasizes that teachers, as both educators and continual learners, are constantly met with challenges and barriers. The evolving landscape of innovative learning and technology development prompts teachers to reflect on the implications for their roles. Utilizing tools like Canva for graphic design is posited as a means to elevate students' academic achievements.

Undersecretary Alain Del B. Pascua's Aide Memoire, released on June 30, 2020, further underscores the importance of incorporating graphic design skills into educators' repertoire. The memorandum outlines a comprehensive approach to teacher training, leveraging various digital platforms, including webinars, video uploads, television radio broadcasts, and In-Service Training for Teachers (IN-SET). This strategic initiative reflects a recognition of the transformative potential of graphic design, particularly when coupled with technological tools, in augmenting the professional development of educators.

Social Media

Albiladi and Abdeen's (2021) research underscores the potential of social media platforms as versatile tools for language education. The respondents of their study believe social media's effectiveness in enhancing students' language proficiency affirms its significance in contemporary education. These researchers firmly endorse the effectiveness of social media in markedly improving students' language proficiency, providing unequivocal evidence of its paramount importance in modern education.

Furthermore, Gagalang (2022) amplifies the role of social media as a valuable resource for academic success. Respondents in the study acknowledged the instrumental role of social media in their studies, serving as a platform for information dissemination, task completion, and submission of outputs. This underscores the multifaceted utility of social media as a supportive tool in the educational process.

Specifically, the convergence of Albiladi and Aberdeen's findings with Gagalang's study highlights the pivotal role of social media in modern education. Social media platforms serve as dynamic spaces for learning and collaboration, providing teachers and students access to a wealth of resources. By leveraging social media effectively, educators can create engaging and innovative learning experiences, ultimately fostering enhanced language proficiency among students.

Moreover, the studies by Albiladi and Abdeen (2021) and Gagalang (2022) collectively reinforce the importance of utilizing social media as a strategic tool for language learning and academic success. By harnessing the potential of social media platforms, educators can create a more dynamic and engaging learning environment, ultimately contributing to the holistic development of students' language skills.

Statement of the Problem

This study determined the level of computer upskilling trainings and technological literacy of Junior High School teachers in the First Legislative Districts of Misamis Oriental for the School Year 2023 – 2024. The result of the study would be the basis for a technology skills enhancement plan. Specifically, this study sought to answer the following:

1. What are the respondents' characteristics in terms

of sex, position, teaching experience, related trainings and seminars attended, and attitude towards computer upskilling trainings?

2. How do the respondents assess their level of computer upskilling training in terms of innovation in education, education in the virtual world, tv-based instruction/radio-based instruction, and information and communication technology?

3. What is the respondents' level of technological literacy based on video conferencing, audio and video editing, microsoft office skills, graphic design, and social media?

4. Is there a significant difference in the respondents' technological literacy and their characteristics?

5. Is there a significant relationship between the respondents' computer upskilling trainings and their technological literacy?

6. Based on the findings of the study, what technological skills enhancement plan on computer upskilling can be designed?

Theoretical Framework

This study is inherently linked to the Diffusion of Innovation Theory, as it seeks to understand and analyze the adoption of computer upskilling training programs by educators. Everett Rogers' theory provides a robust framework for examining how new ideas and technologies are adopted, emphasizing key factors that influence the adoption process. In the context of this study, the theoretical framework is particularly relevant as it offers valuable insights into educators' decision-making processes regarding the integration of new technological practices into their professional routines.

Firstly, the concept of relative advantage is central to understanding educators' motivations to participate in computer upskilling training programs. Educators are likely to engage with these initiatives if they perceive them as offering significant benefits over traditional methods of professional development. The theory suggests that individuals are more inclined to adopt innovations that promise tangible advantages, such as improved teaching effectiveness, enhanced student engagement, and increased lesson planning and delivery efficiency.

Furthermore, compatibility plays a crucial role in shaping educators' attitudes toward computer upskilling training programs. According to the theory, individuals are likelier to adopt innovations that align with their values, needs, and practices. In the context of education, compatibility refers to the extent to which training programs resonate with educators' pedagogical goals, teaching methodologies, and professional aspirations. This study can shed light on the factors that facilitate or hinder adoption by exploring the compatibility of computer-upskilling training programs with educators' existing beliefs and practices. Complexity is another key factor addressed by the diffusion of innovation theory, which highlights the importance of ease of understanding and use of innovation. Educators are more likely to engage with training programs that are perceived as user-friendly, accessible, and easy to implement in their professional practice.

Additionally, the theory emphasizes the significance of trialability and observability in the adoption process. Trialability allows educators to experiment with new technologies and practices on a limited basis, while observability enables them to observe tangible outcomes and benefits resulting from their participation. By examining educators' experiences with trialability and observability in computer upskilling training programs, this study can provide insights into the factors that facilitate or inhibit adoption and inform strategies for promoting engagement and participation. This theory widely offers a comprehensive framework for understanding educators' adoption of computer upskilling training programs.

Scope and Limitations

This study focused on the computer upskilling trainings and teachers' technological literacy in the First Legislative Districts of Misamis Oriental for School Year 2023 – 2024 as basis for technology skills enhancement plan. The variables of this study are the following: computer upskilling training such as innovation in education, education in the virtual environment, tv-based instruction/radio-based instruction, and information and communication technology; teachers' technological literacy in terms of video conferencing, audio and video editing, microsoft office skills, graphic design, and social media; and the respondents' characteristics in terms of sex, position, teaching experience, related trainings and seminars attended, and attitude towards computer upskilling trainings. The respondents were two hundred fifty (250) teachers from the First Legislative Districts of Misamis Oriental.

METHODOLOGY

Research Design

The research design selected for this study, which is descriptive research, is particularly suited to illuminate the relationship between computer upskilling trainings and the technological literacy of Junior High School teachers in the First Legislative Districts of Misamis Oriental for the School Year 2023–2024. Descriptive research, as defined by Manjunatha (2019), focuses on portraying the characteristics and attributes of the population or phenomenon under investigation. In the context of this study it entailed a meticulous examination of the current levels of technological literacy among the selected teachers. The primary variables of interest are computer upskilling trainings and technological literacy. The former pertains to the training programs designed to enhance the technological proficiency of teachers, while the latter encompasses the teachers' actual competence and adeptness in utilizing various digital tools and technologies. Through the application of a descriptive research design, the study aimed to establish a clear and factual account of the existing state of technological

literacy. This approach does not seek to establish causation but rather to objectively document the levels of proficiency. By doing so, it provided a foundational understanding of the teachers' technological capabilities.

Study Setting

The investigation was carried out within the educational landscape of the First Legislative Districts of Misamis Oriental. Situated in the northern region of Mindanao in the Philippines, Misamis Oriental Division encompasses a diverse array of educational institutions, ranging from elementary to secondary levels. The First Legislative District of Misamis Oriental encompasses a diverse array of municipalities, each contributing to the district's unique socio-economic and cultural landscape. Balingasag, known for its coastal charm, and Balingoan, a bustling port town, are integral parts of the district's economic activities. Binuangan and Kinoguitan add agricultural richness with their fertile lands, while Lagonglong offers natural attractions and scenic landscapes. Magsaysay, a municipality with a rich history, and Medina, with its vibrant coastal communities, further contribute to the district's cultural tapestry. Salay, Sugbongcogon, and Talisayan, with their coastal features, play key roles in the maritime activities of the district. Together, these municipalities within the First Legislative District of Misamis Oriental showcase a blend of economic vitality, cultural diversity, and natural beauty. Furthermore, the study aimed to offer insights reflective of the broader educational context in the Misamis Oriental Division. Encompassing multiple districts within the division, the research design sought a comprehensive examination of the impact of computer upskilling programs on technological literacy.

Study Population and Sampling Technique

In this research endeavor, the study population consisted of two hundred fifty (250) Junior High School teachers from the First Legislative Districts of Misamis Oriental for the School Year 2023 – 2024. The deliberate choice of this population aimed to ensure a comprehensive representation of educators within a specific geographic and legislative context. Moreover, the respondents of the in-depth interview were Teacher I, II, III, Master I and II, collectively representing various positions essential for gathering comprehensive data.

To capture a diverse yet targeted subset of teaching professionals, the researcher employed a purposive sampling technique. This sampling is used to select participants directly relevant to the research objectives, ensuring that teachers with varying levels of experience in technology integration are included. Specifically, the selection focused on Junior High School teachers within the First Legislative Districts of Misamis Oriental who have participated in computer upskilling training. The identification of respondents was facilitated in collaboration with the ICT coordinators of schools within the First Legislative Districts.

Table A: Distribution of Respondents

District	School	Population	Respondents				Total Respondents
			Grade 7	Grade 8	Grade 9	Grade 10	
Balingasag Central	Rosario NHS	18	2	1	2	2	7
Balingasag North	Misamis Oriental NHS	43	7	3	4	5	19
Balingasag South	Baliwagan NHS	59	8	7	9	7	31
Lagonglong	Dampil NHS	22	2	3	4	3	12
Lagonglong	Lumbo NHS	29	4	6	5	6	21
Salay	Looc NHS	14	2	2	3	2	9
Salay	Salay NHS	67	7	5	7	6	25
Sugbongcogon	Binuangan NHS	16	2	3	2	3	10
Sugbongcogon	Sugbongcogon NHS	32	5	4	5	7	21
Kinoguitan	Esperanza NHS	23	4	5	6	3	18
Kinoguitan	Kinoguitan Nat'l Agricultural HS	14	1	2	3	2	8
Balingoan	Mantangale NHS	24	4	5	2	5	16
Talisayan	Talisayan NHS	46	3	5	4	6	18
Talisayan	Sta. Ines NHS	20	4	2	2	2	10
Medina North	Medina NCHS	70	7	5	7	6	25
Total	**16 NHS**	**497**	**62**	**58**	**65**	**65**	**250**

Research Instruments

This study utilized a researcher-made questionnaire, which has been patterned from the following: Regional Advisory No. 0098, s. 2023 on EdTech Teacher Training Center Computer Upskilling Training: ICT Integration in the 21st Century Education; DepEd Order No. 016, s. 2023 on the Revised Guidelines on the Implementation of the Department of Education Computerization Program (DCP); DepEd Memorandum No. 082, s. 2020 on the Guidelines on the Registration of Teachers and School Leaders for NEAP-Recognized Professional Development Program Courses; and DepEd Order No. 42, s. 2017 on National Adoption and Implementation of the Philippine Professional Standards for Teachers.

Part I of the questionnaire gathered information of the respondents' characteristics in terms of sex, position, teaching experience, related trainings and seminars attended, and attitude towards computer upskilling trainings. Part II is patterned from the DepEd memoranda and advisories which gathered information on the computer upskilling training on terms of Innovation in Education, Education in the Virtual Environment, TV-Based Instruction/Radio-Based Instruction, and Information and Communication Technology. Part III, the researcher-made, on the other hand gathered data on the teachers' technological literacy in terms of video conferencing, audio and video editing, Microsoft office skills, graphic design, and social media. And, for the last part of the questionnaire, a set of interview guide questions for teachers was provided. These open-ended questions helped gather qualitative data for this study.

Statistical Treatment of Data

The data that was collected in this study have undergone specific statistical treatments. It was encoded, tallied, and tabulated to ensure a clear and comprehensive presentation of the results. The chosen statistical treatment involved the utilization of descriptive statistics, such as mean, standard deviations, frequency, and percentage to effectively characterize the variables.

Additionally, Spearman Correlation Test was employed to determine the significant relationships and effects between computer upskilling training and teachers' technological literacy. On the other hand, the Kruskal Wallis test was utilized to test if there was a significant difference between the demographic profiles (sex, position, teaching experience, related training and seminars attended) and teachers' technological literacy with a level of significance 0.05. These methods enabled a thorough examination of the data that shed light on the important connections within the dataset.

Ethical Consideration

Ensuring the privacy of participating teachers was of paramount importance in this research endeavor. Providing this assurance fostered a greater willingness among teachers to engage openly. The following ethical considerations was implemented:

Every participating teacher was approached for informed consent, wherein the study's purpose, data collection process, and the handling of their information was clearly elucidated. This step guaranteed that they retain the option to withdraw from the study at any point without incurring any adverse consequences. Further, the teachers were instructed to substitute any personally identifiable information (such as names, school names, or contact details) from the data during the analysis and reporting phases. Assigning aliases to participants was also considered to further safeguard their identities. Collected data was securely stored, employing encryption where appropriate, and limiting access exclusively to authorized personnel. This precaution was taken to prevent any inadvertent disclosure of data to unauthorized parties. Importantly, the research design and data handling procedures have undergone an ethical review, seeking approval from an institutional review board (IRB) or ethics committee. This step was crucial in ensuring that the study adhered to established ethical standards and guidelines.

RESULTS AND DISCUSSIONS

Problem 1. What are the Respondents' Characteristics in Terms of Sex, Position, Teaching Experience, Teaching Experience, Related Trainings and Seminars Attended, and Attitude Towards Computer Upskilling Trainings?

Table 1: Distribution of Respondents' Characteristics in terms of Sex, Position, Teaching Experience, and Related Training and Seminars Attended

Sex	**Frequency**	**Percentage**
Male	48	19.20
Female	202	80.80
Total	**250**	**100.00**
Position	**Frequency**	**Percentage**
Master Teacher II	2	00.80
Master Teacher I	15	06.00
Teacher III	57	22.80
Teacher II	27	10.80
Teacher I	149	59.60

Total	**250**	**100.00**
Teaching Experience	**Frequency**	**Percentage**
26 years and above	43	17.20
21 – 25 years	14	05.60
16 – 20 years	19	07.60
11 – 15 years	33	13.20
6 – 10 years	61	24.40
1 – 5 years	70	28.00
Less than 1 year	10	04.00
Total	**250**	**100.00**
Related Trainings and Seminars Attended	**Frequency**	**Percentage**
7 times and above	24	09.60
3 – 6 times	48	19.20
1 – 3 times	178	71.20
Total	**250**	**100.00**

Table 1 depicts the distribution of respondents' Characteristics. A total of 250 respondents is shown. In terms of sex, the table revealed the highest frequency of 202 (80.80%) respondents, which belonged to female. This indicates a notable imbalance in favor of female participants, suggesting a higher level of active engagement in the technology skills enhancement plan compared to their male counterparts. Therefore, the study highlights that female constituted the predominant and more actively involved group, making up 80% of the participants.

On the other hand, the lowest frequency is 48 (19.2%) respondents belonged to male. It connotes that there is a very small percentage of population of male teachers on the field. This observation underscores a striking gender disparity within the teaching profession, with a considerably smaller proportion of male educators represented in the sample. Historically, teaching has been viewed as a profession aligned with feminine qualities, leading to cultural biases and societal expectations that may discourage men from pursuing careers in education. Khalfina *et al.* (2020) stated that males traditionally have teacher qualities such as dedication, energy, and ability to lead, but it was found that feminine teachers prevail among modern female educators.

In connection to this, the study highlights the sex distribution among the respondents, with a significant majority comprising 202 (80.80%) respondents, being female, while 48 (19.2%) respondents were male. This indicates a notable imbalance in favor of female participants, suggesting a higher level of active engagement in the technology skills enhancement plan compared to their male counterparts. Therefore, the study underscores that females constituted the predominant and more actively involved group, representing 80% of the participants.

In terms of position among 250 respondents, it revealed that the highest frequency, held the position of Teacher I. It has been observed that the majority at 149 (59.6%) respondents of active training participants are newly hired teachers. This trend is largely due to the fresh perspectives and eagerness to learn that new teachers bring to the table. Additionally, school heads often prefer to select newly hired teachers for training participation because they can quickly integrate new methodologies and technologies into the school's curriculum. As observed, these teachers are often more receptive to innovative approaches and can serve as catalysts for positive change within the school community.

While on the other hand, the lowest frequency, at 2 (00.80%) respondents, held the position of Master Teacher II position. As evident from observations, the attainment of a teaching position within the Department of Education is notably limited compared to other roles within the organization. Consequently, educators are increasingly motivated to engage in professional development activities, including attending seminars, workshops and pursuing further studies, in their pursuit of advancement to higher positions. These findings underscore the significance of understanding the distribution of teaching roles and the implications for participation in technology skills enhancement plans, emphasizing the need to tailor interventions to cater to educators' diverse needs and experiences at different stages of their careers (Comon & Corpuz, 2024).

In terms of teaching experience among the total of 250 respondents, the table revealed a notable concentration of educators with 1 to 5 years of experience, representing the highest frequency at 70 (28%) respondents. As observed, one contributing factor to this trend is the enthusiastic energy displayed by newly hired teachers, who eagerly attend trainings and seminars to impress their superiors. Often, they are the first to be assigned to attend to trainings and seminars, as more experienced teachers may prioritize other responsibilities over professional development opportunities. Conversely, participants

with less than 1 year of teaching experience constitute the lowest frequency, accounting for only 10 (4%) respondents. The occurrence of the lowest frequency can be attributed to the relatively short duration of their teaching tenure, which limits their opportunities to attend training sessions. Annually, the Division Office typically hires only one or two teachers per school, with careful consideration given to allocating educators to institutions facing staffing shortages due to various reasons such as retirements, leaves, or unfortunate circumstances like deaths. Hence, the lowest frequency.

In terms of related trainings and seminars attended by the 250 respondents, these are trainings that encompass structured programs tailored to enhance individuals' proficiency in computer technologies, with a focus on Information and Communication Technologies (ICTs). These programs can be localized at various levels, ranging from the school level to the international level. It is shown in the table that the highest frequency, comprising 178 (71.20%) respondents, indicates that a significant majority attended 1 to 3 related sessions. This can be attributed to both the tenure of teachers and their voluntary engagement in training sessions. On the other hand, the lowest frequency, representing 24 (9.6%), attended 7 or more trainings and seminars on computer upskilling. These respondents likely represent experienced teachers with lengthy tenures in the profession. It's apparent that the longer individuals serve as public educators, the greater their exposure to various training opportunities and seminars.

Table 2: Distribution of Respondents' Attitude towards Computer Upskilling Training

Indicators	Mean	SD	Description
I enjoy engaging in computer training programs.	3.59	0.54	Strongly Agree
I am open-minded and receptive to new technologies introduced in training.	3.65	0.56	Strongly Agree
I feel a sense of satisfaction when engaging in computer training.	3.58	0.56	Strongly Agree
I have a positive attitude towards computer training.	3.60	0.54	Strongly Agree
I view computer upskilling as essential for professional development.	3.68	0.54	Strongly Agree
I don't find pleasure in learning about computers.	1.85	0.90	Disagree
I don't feel motivated to attend computer training programs.	1.80	0.84	Disagree
I don't have a strong interest in improving my computer knowledge.	1.83	0.89	Disagree
I find it difficult to learn anything about computers.	2.10	0.88	Disagree
I find computer upskilling training a waste of time.	1.76	0.87	Disagree
Overall	**2.74**	**0.71**	**Agree**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 2 presents the results concerning the distribution of respondents' attitudes toward computer upskilling training. The overall mean rating is 2.74 (SD = 0.71) described as Agree. This indicates a positive reception to the computer upskilling training. It is observed that while teachers struggle and juggle their duties and responsibilities, they recognize the evolving needs of 21st-century learners. As a result, the positive outcome depicted in this table reflects teachers' proactive approach to embracing digital technologies, particularly evident during the pandemic, as noted by Tomczyk *et al.* (2021).

The indicator, the findings reveal that I view computer upskilling as essential for professional development, obtained the highest mean rating of 3.68 (SD = 0.54), described as Strongly Agree. With the rapid evolution of technology, teachers must adapt to keep pace with the changing educational landscape. It is observed that as students increasingly favor interactive and technology-driven learning experiences, educators recognize the significance of enhancing their computer skills through professional development initiatives. The study conducted by Stošić and Mikhailova (2023) emphasizes the pivotal role of well-trained teachers in effectively integrating innovative technologies into educational practices. This resonates with the significance of computer upskilling training highlighted in the data, as attitudes toward such training programs directly influence educators' readiness and willingness to embrace new technologies in their teaching practices.

Conversely, the indicator, I find computer upskilling training a waste of time, obtained the lowest mean rating of 1.76 (SD = 0.87), described as Disagree, still reveals an underlying positive attitude towards such training. This contradiction underscores that even those who may express reservations still acknowledge the potential benefits of computer upskilling for their professional development. It implies that teachers perceive computer training as a valuable endeavor capable of enhancing their skills and effectiveness in the classroom. This recognition highlights the importance of fostering a culture of continuous learning and skill development among educators. Building on the findings discussed above, Stošić and Mikhailova (2023) emphasize the necessity for teachers to continuously enhance their ICT skills to effectively incorporate new digital technologies into their teaching practices.

Problem 2. How Do the Respondents Assess Their Level of Computer Upskilling Training in Terms of Innovation in Education, Education in the Virtual World, Tv-Based Instruction/Radio-Based Instruction, and Information and Communication Technology?

The data presented in Table 3 provides valuable insights into the distribution of respondents' computer upskilling training in terms of Innovation in Education with an overall mean rating of 3.99 (SD = 0.81) described as At All Times. This suggests that the respondents significantly enhanced their literacy in the subject matter through the training, indicating that the program effectively achieved its intended objectives. The observed increase in literacy levels among the respondents underscores the success and efficacy of the training in equipping participants with the necessary skills and knowledge.

The highest mean rating of 4.00 (SD = 0.83), described as At All Times, for This training has improved the adaptation of materials, including ICT tools, to diverse student needs, underscores the effectiveness of the training in tailoring educational resources to accommodate students' varying requirements. This adaptation reflects the purpose-oriented activities Mykhailyshyn *et al.* (2018) endorsed, which aimed to enhance operational efficiency and foster organizational development within educational settings.

Table 3: Distribution of Respondents' Attitude towards Computer Upskilling Training

Indicators	Mean	SD	Description
This training has improved. . .			
The ability to select resources for targeted learning goals.	3.99	0.81	At All Times
The ability to develop engaging teaching resources, especially those utilizing ICT.	3.99	0.82	At All Times
The adaption of materials, including ICT tools, to diverse student needs.	4.00	0.83	At All Times
The integration of ICT tools for dynamic learning experiences.	4.00	0.83	At All Times
The insights for strategic use of technology in education.	3.98	0.78	At All Times
The assessment skills for evaluating resource effectiveness.	3.98	0.80	At All Times
The incorporation of a range of resources for personalized student learning.	3.97	0.77	At All Times
The use of ICT tools for both formative and summative assessments.	3.99	0.81	At All Times
The mindset to stay updated on emerging technologies relevant to education.	4.00	0.83	At All Times
The approach to selecting, developing, and using teaching resources effectively.	3.98	0.80	At All Times
Overall	**3.99**	**0.81**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Another highest mean rating of 4.00 (SD = 0.83), described as At All Times, is the indicator This training has improved the integration of ICT tools for dynamic learning experiences, which reflects educators' proactive stance in leveraging technology to enhance student engagement. This integration aligns with educational innovations highlighted by Mykhailyshyn *et al.* (2018), which aimed to foster organizational development and operational efficiency.

On the other hand, another indicator, obtained the highest mean rating of 4.00 (SD = 0.83), described as At All Times, is This training has improved the mindset to stay updated on emerging technologies reflects educators' commitment to continuous learning and professional development. SEAIETI's training program recognizes the dynamic nature of the educational landscape and emphasizes the importance of staying abreast of emerging technologies.

On the other hand, the indicator, This training has improved the incorporation of a range of resources for personalized student learning obtained the lowest mean rating of 3.97 (SD = 0.77), described as At All Times. Despite being the lowest, it still reflects a highly positive perception of the training's impact on incorporating diverse resources to enhance personalized learning experiences. It is observed that despite teachers' high literacy in this area, barriers persist in applying what they have learned from training.

Mykhailyshyn *et al.* (2018) highlighted the significance of cultivating learner-centered approaches that prioritize students' acquisition of skills and knowledge essential for navigating modern technologies. This emphasis not only prepares students for new roles in the information society but also underscores the evolving role of educators as facilitators of learner-driven learning experiences.

Table 4: Distribution of Respondents' Computer Upskilling Training in terms of Education in the Virtual Environment

Indicators	Mean	SD	Description
This training has improved. . .			

The ability to utilize ICT positively in teaching and learning.	3.98	0.65	At All Times
The ability to design effective strategies for positive ICT use in education.	3.98	0.67	At All Times
The ability to mentor colleagues in implementing policies for positive ICT use.	3.98	0.65	At All Times
The ability to create an inclusive virtual learning environment.	3.98	0.63	At All Times
The ability to develop strategies to promote engagement in virtual classrooms.	3.99	0.67	At All Times
The ability to foster collaboration among students in the virtual teaching and learning process.	3.99	0.69	At All Times
The skills in adapting teaching methods for online platforms.	3.97	0.62	At All Times
The insights into effective assessment strategies in a virtual environment.	3.98	0.65	At All Times
The ability to create a positive and supportive online learning community.	3.99	0.70	At All Times
The ability to address challenges and promote ethical behavior in the virtual classroom.	3.99	0.69	At All Times
Overall	**3.98**	**0.66**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 4 presents the distribution of respondents' computer upskilling training on education in the virtual environment with an overall mean rating of 3.98 (SD = 0.66), described as At All Times. This signifies a high level of satisfaction and agreement among participants regarding the effectiveness of the training in preparing them for virtual teaching environments. It further reinforces the importance of such training programs in equipping educators with the necessary skills and competencies to adapt to evolving educational practices and technologies. In the context of the challenges presented to educators in 2020, as highlighted by Ellis *et al.* (2021), the findings from Table 4 underscore the critical importance of equipping instructors with the necessary skills and competencies to navigate the virtual teaching and learning landscape effectively.

Meanwhile, the indicator, This training has improved the ability to create a positive and supportive online learning community obtained the highest mean rating of 3.99 (SD = 0.70), described as At All Times. This implies the importance placed by participants on fostering a conducive online learning environment characterized by support and positivity, highlighting its significant role in facilitating effective virtual teaching and learning experiences. This high rating reflects the recognition among educators of the critical role that a positive and supportive online learning community plays in promoting student engagement and success. It indicates a collective commitment to fostering a collaborative and inclusive virtual learning environment conducive to effective teaching and learning. This aligns with the study by Chang *et al.* (2019), which underscores the growing recognition of the value of online learning and the importance of fostering positive online learning communities.

Another indicator obtained the highest mean rating of 3.99 (SD = 0.69), described as At All Times, is This training has improved the ability to address challenges and promote ethical behavior in the virtual classroom. This underscores educators' proficiency in navigating the complexities of online instruction. Smith *et al.* (2019) highlighted the increasing popularity of online classes even before the pandemic, emphasizing the accessibility of virtual education. Recognizing the need for educators to adapt to the virtual environment, SEAIETI has developed a comprehensive training program endorsed by NEAP.

The third indicator that obtained the highest mean rating of 3.99 (SD = 0.69), described as At All Times, is This training has improved the ability to foster collaboration among students in the virtual teaching and learning process. This reflects educators' commitment to creating inclusive and interactive online learning environments. SEAIETI's training program acknowledges the importance of fostering a supportive virtual learning community. Endorsed by NEAP, this program aligns with national standards and emphasizes the role of educators in facilitating collaboration and engagement among students in the virtual classroom (NEAP, 2020).

Furthermore, the fourth indicator that obtained the highest mean rating of 3.99 (SD = 0.67), described as At All Times, is This training has improved the ability to develop strategies to promote engagement in virtual classrooms. This signifies a pivotal aspect of educators' proficiency in navigating the virtual learning landscape. This high rating underscores the proactive stance taken by educators in enhancing student participation and ultimately improving learning outcomes within virtual classrooms. The significance of this indicator lies in its indication of educators' adaptability and responsiveness to the challenges posed by online instruction. Martinez *et al.* (2020) underscored the paramount importance of interactive and engaging online learning experiences in their study. In contrast, the indicator, This training has improved the skills in adapting teaching methods for online platforms obtained the lowest mean rating of 3.97 (SD = 0.62), described as At All Times. Despite being

the lowest, it still reflects a highly positive perception of the training's impact on enhancing educators' abilities to adjust their teaching approaches effectively for online instruction. This indicates a willingness among participants to further develop and refine their skills in adapting to the demands of online teaching environments (Brown *et al.*, 2018). Despite the lowest mean rating, the slight improvement in educators' skills in adapting teaching methods for online platforms suggests that there has been some progress in this area.

Table 5: Distribution of Respondents' Computer Upskilling Training in terms of TV-Based Instruction/Radio-Based Instruction

Indicators	**Mean**	**SD**	**Description**
This training has improved. . .			
The ability to design TV-based instruction.	3.84	1.02	At All Times
The ability to create engaging content for TV and radio broadcasts.	3.82	0.99	At All Times
The ability to learn strategies for maximizing student engagement through broadcasts.	3.82	0.97	At All Times
The ability to adapt teaching methods for effective TV education.	3.84	1.00	At All Times
The ability to use visuals and audio in enhancing TV and radio instruction.	3.87	1.00	At All Times
The ability in scriptwriting for educational broadcasts.	3.85	1.049	At All Times
The ability to use technology in TV and radio instruction.	3.90	1.10	At All Times
The insights for audience analysis in educational programs.	3.86	1.02	At All Times
The ability to assess the effectiveness of TV and radio-based content.	3.88	1.06	At All Times
The ability to collaborate for a team effort in creating impactful educational broadcasts.	3.93	1.14	At All Times
Overall	**3.86**	**1.03**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 5 shows the distribution of respondents' computer upskilling training in terms of TV-Based Instruction/ Radio-Based Instruction with an overall mean rating of 3.86 (SD = 1.03) described as At All Times. The positive perceptions of the computer upskilling training program emphasize the importance of educators embracing visual literacy and adapting to contemporary trends. By incorporating visual and auditory elements into educational broadcasts, educators can enhance the learning experience and better prepare students for success in today's visually-oriented society. Additionally, Nicolaou *et al.* (2019) highlighted in their study the importance of visual media in the educational process.

The indicator, This training has improved the ability to collaborate for a team effort in creating impactful educational broadcasts, obtained highest mean rating of 3.93 (SD = 1.14), described as At All Times. This indicates that the training has been highly effective in enhancing educators' collaborative skills, enabling them to work collectively to produce engaging and impactful educational content for TV and radio broadcasts. In 2020, the Department of Education – Misamis Oriental took a significant step by issuing Division Memorandum No. 233, which required schools to establish TV-Based and Radio-Based Instruction Teams.

Contrarywise, the indicator, This training has improved the ability to learn strategies for maximizing student engagement through broadcasts, obtained the lowest mean rating of 3.82 (SD = 0.97), described as At All Times. Despite this being the lowest rating among the indicators, it still indicates a highly positive perception of the training's impact on educators' ability to enhance student engagement through broadcasts. This observation suggests a strong recognition among participants of the training's effectiveness in equipping them with strategies to foster active student participation, even in the realm of TV and radio-based instruction.

Another indicator, This training has improved the ability to create engaging content for TV and radio broadcasts, achieving the lowest mean rating of 3.82 (SD = 0.99) described as At All Times. This indicates that despite the lower mean rating, there is still recognition of the importance of the skill, emphasizing the need for further training and support in creating engaging content for TV and radio broadcasts. Nicolaou *et al.* (2019) highlighted the significance of keeping pace with societal advancements, particularly in education, to embrace emerging innovations such as TV-Based and Radio-Based Instruction.

Table 6: Distribution of Respondents' Computer Upskilling Training in terms of Information and Communication Technology

Indicators	**Mean**	**SD**	**Description**
This training has improved. . .			

The proficiency in using essential ICT tools.	3.58	0.55	At All Times
The skills in leveraging technology for effective classroom management.	3.53	0.57	At All Times
The ability to design strategies for integrating ICT to enhance student engagement.	3.55	0.55	At All Times
The ability to create and deliver multimedia presentations.	3.56	0.57	At All Times
The insights in utilizing educational software for diverse learning needs.	3.52	0.55	At All Times
The ability to effectively use digital resources for interactive and personalized learning.	3.51	0.55	At All Times
The understanding of internet safety and digital citizenship.	3.51	0.55	At All Times
The ability to troubleshoot common ICT issues in educational settings.	3.47	0.60	At All Times
The ability to integrate online collaboration tools for student interaction and projects.	3.50	0.58	At All Times
The motivation to stay updated on emerging ICT trends in education.	3.54	0.56	At All Times
Overall	**3.53**	**0.56**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

The data presented in Table 6 provides insights into the distribution of respondents' computer upskilling training program focusing on Information and Communication Technology with an overall mean rating of 3.53 (SD = 0.56) and described as At All Times. The data indicates a consistently positive view of the training's efficacy in improving educators' ICT competencies. Upon analysis, it is evident that respondents hold generally positive perceptions regarding the effectiveness of the training program in enhancing their ICT skills. The positive perceptions of the computer upskilling training program, as evidenced by the data in this table, emphasize the importance of ICT literacy in education and the role of training initiatives in enhancing educators' ICT competencies.

The indicator, This training has improved the proficiency in using essential ICT tools, obtained the highest mean rating of 3.58 (SD = 0.55), described as At All Times. This suggests that the training has been particularly effective in enhancing educators' competence in utilizing fundamental ICT tools necessary for instructional purposes. It is evident that there is a favorable view of the program's impact on improving educators' proficiency in using essential ICT tools. This resonates with the insights provided by Bayucca (2022), who emphasized the importance of ICT literacy in the efficient performance of a job, particularly in the context of education. As technology continues to advance rapidly, ICT skills are increasingly essential for teachers to succeed in the present generation.

On the contrary, the indicator, This training has improved the ability to troubleshoot common ICT issues in educational settings, obtained the lowest mean rating of 3.47 (SD = 0.60) described as At All Times. Despite being the lowest, it still reflects a highly positive perception of the training's impact on equipping educators with troubleshooting skills, although slightly lower than other areas. According to Bayucca (2022), teachers' adaptability allows them to comply with the demands of their work by embracing technologies and using them to enhance various aspects of their professional practice, including teaching competence, pupil development, community interaction, and professional growth. This goes with also learning how to fix technical issues so teachers can deliver their lesson well.

Table 7: Summary Distribution of the Respondents' Level of Computer Upskilling Trainings

Variables	Mean	SD	Interpretation
Innovation on Education	3.99	0.81	Highly Literate
Education on the Virtual Environment	3.98	0.66	Highly Literate
TV-Based/Radio-Based Instruction	3.86	1.03	Highly Literate
Information and Communication Technology	3.53	0.56	Highly Literate
Overall	**3.84**	**0.77**	**Highly Literate**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 7 presents the summary distribution of the respondents' level of computer upskilling trainings. The overall mean rating is 3.84 (SD = 0.77) interpreted as Highly Literate. This result echoes the sentiments expressed in studies such as Bayucca (2020) and Hasanah and Dewi (2022), which emphasize the vital role of continuous professional development in navigating the complexities of modern education.

The variable, Innovation on Education, obtained the highest mean rating of 3.99 (SD = 0.81) interpreted as Highly Literate. This underscores a prevalent sentiment of agreement and enthusiasm toward innovative educational practices. The endorsement of this training component suggests that participants recognize its value in fostering pedagogical innovation and embracing thorough methodologies to enhance teaching and learning experiences. These findings align with the assertions made by Albiladi and Abdeen (2021), who emphasize the pivotal role of innovative educational practices in preparing educators to navigate the challenges and opportunities of the digital age.

On the other hand, the variable, Information and Communication Technology, obtained the lowest mean rating of 3.53 (SD = 0.56), interpreted as Highly Literate. The slightly lower rating for ICT training may indicate a need for further emphasis or refinement in this particular area to ensure that educators are adequately equipped with ICT competencies to address the demands of contemporary education. Hasanah and Dewi (2022) highlight the importance of comprehensive ICT training in enhancing educators' technological literacy and preparing them to effectively utilize digital tools for instructional purposes.

Similarly, Lang and Triantoro (2022) underscore the critical role of ICT proficiency in facilitating seamless integration of technology in educational settings, emphasizing the need for targeted interventions to bolster educators' ICT competencies. Therefore, while the overall positive sentiment towards computer upskilling training is evident, addressing any potential gaps or challenges in specific areas such as ICT remains essential to ensure comprehensive professional development among educators.

Problem 3. What is the Respondents' Level of Technological Literacy Based on Video Conferencing, Audio and Video Editing, Microsoft Office Skills, Graphic Design, and Social Media?

Table 8: Distribution of Respondents' Technological Literacy in terms of Video Conferencing

Indicators	**Mean**	**SD**	**Description**
As a teacher, I can. . .			
Effectively set up and initiate video conferencing sessions.	3.36	0.60	At All Times
Troubleshoot common technical issues during video conferences.	3.26	0.67	At All Times
Utilize features like screen sharing and chat for interactive sessions.	3.35	0.61	At All Times
Engage students actively during video conferences.	3.30	0.62	At All Times
Adapt my teaching style to effective online instruction.	3.36	0.59	At All Times
Use video conferencing tools to create engaging learning experiences.	3.30	0.63	At All Times
Effectively manage large groups in video conferences.	3.26	0.67	At All Times
Record and share video conference sessions for review.	3.26	0.66	At All Times
Integrate supplementary materials into video conferences.	3.28	0.66	At All Times
Assess student participation and comprehension during video conferences.	3.30	0.65	At All Times
Overall	**3.30**	**0.64**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 8 provides insights into the distribution of respondents' technological literacy in terms of video conferencing. The overall mean rating is 3.30 (SD = 0.64) described as At All Times. The data suggests a consistently high level of confidence among educators in their technological literacy related to video conferencing. As shown in the data, the positive perceptions of teachers' technological literacy in video conferencing highlight the importance of utilizing technology to enhance teaching and learning practices. This underscores the adaptability of educators in embracing technology to enhance their professional growth and teaching practices, as emphasized by Harmilawati *et al.* (2020). Therefore, the positive perception towards video conferencing training reflects its growing importance in supporting educators' professional development and fostering effective communication in virtual learning environments.

The indicator, As a teacher, I can effectively set up and initiate video conferencing sessions, obtained the highest mean rating of 3.36 (SD = 0.60), described as At All Times. This suggests that educators generally find this skill to be straightforward and easily manageable. This observation implies that educators commonly possess the technical knowledge and proficiency required to set up and start video conferencing sessions without encountering significant difficulties or obstacles. The ease of setting up video conferencing sessions aligns with the findings of Torrato *et al.* (2021), who highlighted the user-friendly nature of modern video conferencing platforms, making them accessible and manageable for educators.

Another indicator, As a teacher, I can adapt my teaching style to effective online instruction, described as At All Times, also obtained the highest mean rating of 3.36 (SD = 0.59). This indicates that educators recognize

the pivotal role of adapting teaching styles to effectively leverage online instruction, particularly through platforms like video conferencing, to enhance student learning experiences and ensure continuity in education. According to Torrato *et al.* (2021), video conferencing has revolutionized education, providing a flexible approach to open and distance learning.

Conversely, the indicator, As a teacher, I can record and share video conference sessions for review, obtained the lowest mean rating of 3.26 (SD = 0.66) described as At All Times. This suggests that respondents may not prioritize this aspect as much as others, yet they still demonstrate a high level of proficiency in this regard. While this indicator may have garnered a lower rating, it still reflects the overall technological literacy of the respondents. This finding aligns with the research of Torrato *et al.* (2021), who highlighted the importance of educators being proficient in various aspects of video conferencing, including recording and sharing sessions, to facilitate effective remote learning experiences.

Meanwhile, another indicator, As a teacher, I can effectively manage large groups in video conferences, described as At All Times, also achieved the lowest mean rating of 3.26 (SD = 0.67). This indicates that while video conferencing is a valuable tool for remote education, educators may face difficulties in effectively managing large groups within virtual environments. Educators need to employ techniques for fostering active participation, managing discussions, and ensuring equitable opportunities for engagement among students. By leveraging insights from Torrato *et al.*'s (2021) research, educators can refine their approach to managing large groups in video conferences, ultimately enhancing the quality and effectiveness of virtual learning experiences.

Furthermore, the indicator, As a teacher, I can troubleshoot common technical issues during video conferences, described as At All Times, also got the lowest mean rating of 3.26 (SD = 0.67). This suggests that educators may encounter challenges in resolving technical issues effectively during video conferences, potentially hindering the smooth conduct of online sessions. It has been observed that while video conferencing offers numerous benefits for remote teaching, such as facilitating virtual interaction and collaboration, technical glitches can disrupt the learning process and impede effective communication (Torrato *et al.*, 2021).

Table 9: Distribution of Respondents' Technological Literacy in terms of Audio and Video Editing

Indicators	**Mean**	**SD**	**Description**
As a teacher, I can. . .			
Edit audio and video files for instructional purposes.	3.32	0.66	At All Times
Integrate audio and video elements into presentations or lessons.	3.36	0.61	At All Times
Use video editing software (e.g. capcut, filmora, etc.) to create educational content.	3.30	0.66	At All Times
Apply transitions and effects in videos.	3.30	0.67	At All Times
Synthesize audio and video components for multimedia materials.	3.27	0.69	At All Times
Trim and arrange video clips for instructional messages.	3.28	0.67	At All Times
Incorporate captions or subtitles for diverse learners.	3.28	0.68	At All Times
Adjust audio levels for clarity and emphasis.	3.32	0.69	At All Times
Merge visuals and audio for cohesive educational resources.	3.28	0.67	At All Times
Utilize editing tools to enhance instructional materials.	3.29	0.68	At All Times
Overall	**3.30**	**0.67**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 9 presents the distribution of respondents' technological literacy in terms of audio and video editing. The overall mean rating is 3.30 (SD = 0.67) described as At All Times. This infers another good training result where teachers can say that they are trained in this area. It is observed that there are teachers who utilize audio and video editing, which will suit to their lessons. Correspondingly, the results suggest a high level of proficiency among educators in utilizing audio and video editing tools for instructional purposes, aligning with the findings of Bayucca (2020), which emphasize the critical role of these skills in modern education. Additionally, the positive perception towards audio and video editing skills underscores their significance in enriching educational experiences and fostering multimedia-rich learning environments, as highlighted by Movitaria and Shandra (2022).

Among the indicators, the highest mean rating is obtained by As a teacher, I can integrate audio and video elements into presentations or lessons, with a mean rating of 3.36 (SD = 0.61) described as At All Times. This indicates a strong proficiency among respondents in incorporating multimedia elements into their instructional materials. It is observed that educators who effectively integrate audio and video elements into their lessons often experience increased student engagement and comprehension. This finding resonates with the research of Movitaria and Shandra (2022), which underscores the positive impact of

employing multimedia-rich content in enhancing student motivation and learning outcomes.

On the contrary, the indicator As a teacher, I can synthesis of audio and video components for multimedia materials received the lowest mean rating of 3.27 (SD = 0.69), yet still described as At All Times. While this aspect garnered a slightly lower rating, it still reflects a high level of proficiency among educators in this skill area. This underscores the importance of providing targeted training programs to address any gaps in knowledge and enhance educators' competence in audio and video editing, as suggested by Bayucca (2020). Overall, the findings highlight the significance of audio and video editing skills in enriching educational experiences and underscore the need for ongoing professional development initiatives to support educators in mastering these essential competencies.

Table 10: Distribution of Respondents' Technological Literacy in terms of Microsoft Office Skills

Indicators	**Mean**	**SD**	**Description**
As a teacher, I can. . .			
Create and format documents in Microsoft Word.	3.59	0.59	At All Times
Develop engaging presentations using PowerPoint.	3.59	0.57	At All Times
Organize and analyze data in Excel spreadsheets.	3.50	0.64	At All Times
Design visually appealing posters or materials in Publisher.	3.42	0.66	At All Times
Craft professional-looking documents in Microsoft Word.	3.44	0.65	At All Times
Utilize Excel formulas for data calculations and analysis.	3.36	0.68	At All Times
Create and manage databases in Microsoft Access.	3.26	0.72	At All Times
Construct forms and surveys using Microsoft Forms.	3.39	0.69	At All Times
Integrate Outlook for efficient email and calendar management.	3.26	0.69	At All Times
Collaborate on documents through OneDrive or SharePoint.	3.26	0.70	At All Times
Overall	**3.41**	**0.66**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 10 illustrates the distribution of respondents' technological literacy in terms of Microsoft Office skills with an overall mean rating of 3.41 (SD = 0.66), described as At All Times. This result suggests the effectiveness of the training initiatives aimed at upskilling teachers' competencies, particularly in Microsoft Office. The provision of organizational accounts for Microsoft Office 365 by the Department of Education underscores the expectation for educators to possess more than just fundamental skills in these applications. The positive perception of microsoft office skills among educators is consistent with the findings of Hasanah and Dewi (2022), who emphasized the significance of proficiency in microsoft office applications in contemporary educational practices. Their research highlights the pivotal role of Microsoft Office in enabling educators to create engaging learning materials, develop compelling presentations, and effectively manage administrative tasks.

Moreover, the indicator, As a teacher, I can create and format documents in Microsoft Word, got the highest mean rating of 3.59 (SD = 0.59), described as At All Times. This finding aligns with the observations that educators frequently utilize Microsoft Word, particularly for generating reports and creating various documents required by the Department of Education. The proficiency demonstrated in this indicator underscores the importance of microsoft word as a fundamental tool in educational settings, enabling educators to efficiently produce and format documents essential for administrative tasks and instructional materials (Hasanah & Dewi, 2022).

Another indicator, As a teacher, I can develop engaging presentations using PowerPoint, described as At All Times, obtained the highest mean rating of 3.59 (SD = 0.57). This signifies a notable proficiency among educators in leveraging Microsoft PowerPoint to create captivating and informative presentations for instructional purposes. Smith and Brown's (2023) study underscores the significance of this finding by revealing that not all teachers possess advanced skills in utilizing microsoft office applications. This highlights the importance of comprehensive guidance and training to empower educators to effectively utilize tools like microsoft powerpoint to enhance their teaching practices.

On the contrary, three indicators are found to have obtained the lowest mean rating. The first indicator is As a teacher, I can integrate Outlook for efficient email and calendar management, obtained a mean rating of 3.26 (SD = 0.69), described as At All Times. This finding highlights the challenges educators encountered in transitioning to Outlook as their official organizational Microsoft Account, as mandated by the Department of Education. While educators were accustomed to using Gmail, the shift to Outlook necessitated adjustments, particularly in terms of navigating the features and functionalities of the new platform (DepEd Misamis Oriental, 2023).

The second indicator among the lowest mean rating is As a teacher, I can collaborate on documents through

OneDrive or SharePoint. It achieved a mean rating of 3.26 (SD = 0.70) described as At All Times. It reveals that while educators recognize the importance of collaborative document editing, they may face challenges or require further training to fully leverage these platforms effectively. This observation is supported by the research of Hasanah and Dewi (2022), which emphasizes that not all teachers are proficient in using Microsoft 365 applications.

Moreover, the third indicator that obtained the lowest mean is As a teacher, I can create and manage databases in Microsoft Access. Its mean is 3.26 (SD = 0.72) described as At All Times. It indicates that while educators recognize the importance of database management skills, they may require further training or support to effectively utilize Microsoft Access for instructional purposes. This observation aligns with the research of Smith and Johnson (2023), which highlights that not all teachers are adept at using Microsoft 365 applications.

Table 11: Distribution of Respondents' Technological Literacy in terms of Graphic Design

Indicators	**Mean**	**SD**	**Description**
As a teacher, I can. . .			
Create visually appealing educational materials.	3.30	0.65	At All Times
Use graphic elements to enhance learning resources.	3.28	0.65	At All Times
Design engaging presentations for students.	3.34	0.63	At All Times
Incorporate images effectively in teaching materials.	3.35	0.62	At All Times
Apply principles of design (e.g. choosing appropriate fonts and colors to enhance readability) for effective communication.	3.34	0.64	At All Times
Create custom graphics for educational purposes.	3.26	0.65	At All Times
Select appropriate fonts and colors for visual impact.	3.35	0.61	At All Times
Modify and customize existing graphics or templates.	3.30	0.65	At All Times
Arrange elements in a visually balanced manner.	3.30	0.67	At All Times
Use graphic design software (e.g. canva, photoshop, etc.).	3.26	0.69	At All Times
Overall	**3.31**	**0.65**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

The data presented in Table 11 illustrates the respondents' technological literacy in terms of graphic design with an overall mean rating of 3.31 (SD = 0.65), described as At All Times. This indicates a high level of technological literacy among educators in utilizing graphic design tools and techniques to create visually compelling educational materials. The findings underscore the versatility and skillfulness of teachers, particularly in the domain of instructional design, which is considered a fundamental aspect of their roles in facilitating effective learning experiences for 21st-century learners. Furthermore, Pentury and Anggraeni's (2022) research emphasizes the transformative role of graphic design in education, highlighting its potential to elevate students' academic achievements through visually engaging learning materials.

Three indicators obtained the highest mean. The first one is As a teacher, I can incorporate images effectively in teaching materials, with a mean rating of 3.35 (SD = 0.62) described as At All Times. This suggests that educators are adept at integrating images into their teaching materials in a manner that enhances visual appeal and captures students' attention effectively. This is one of the commonly used strategy of teachers when they make instructional materials as they mentioned this during the in-depth interview. According to the respondents, it is much easier to utilize images from the internet into their teaching materials. This observation is consistent with the findings of Pentury and Anggraeni (2022), who underscore the importance of graphic design skills in elevating student engagement and academic performance through visually compelling learning materials.

Another second highest is As a teacher, I can select appropriate fonts and colors for visual impact with a mean rating of 3.35 (SD = 0.61), described as At All Times. This rating signifies that educators recognize the importance of visual design elements in enhancing the effectiveness of instructional materials. It suggests that educators value the impact of typography and color choices in capturing students' attention and facilitating comprehension. It is observed that educators are increasingly aware of the role of graphic design in educational settings, particularly in creating visually engaging and informative learning materials. Johnson and Brown's (2023) research emphasizes the transformative potential of graphic design tools like Canva in elevating students' academic achievements.

On the contrary, two indicators are found to have the lowest mean as well. The indicator, As a teacher, I can create custom graphics for educational purposes, got a mean rating of 3.26 (SD = 0.65), described as At All Times. This suggests that educators tend to rely more on pre-existing graphic designs rather than creating custom graphics from scratch. The preference for ready-made graphics may stem from time constraints and the

myriad responsibilities that teachers juggle on a daily basis, extending beyond classroom instruction to include various administrative and ancillary roles.

Furthermore, the challenge of time management and workload distribution among educators is a recurring theme in contemporary education, reflecting the need for streamlined processes and support mechanisms to alleviate burdens on teachers. Addressing this issue requires a multifaceted approach, including the provision of targeted training and resources to enhance educators' graphic design skills and efficiency. The findings align with the insights of Smith and Johnson (2023), which emphasize the need for comprehensive support structures to enable educators to effectively integrate graphic design into their instructional practices and enhance student engagement and academic achievement.

The other lowest mean rating is 3.26 (SD = 0.69), described as At All Times, with the indicator, As a teacher, I can use graphic design software (e.g., canva, photoshop, etc.). This rating reveals that educators may have limited proficiency or experience in utilizing graphic design tools for instructional purposes. It suggests a potential gap in educators' skills related to visual communication and content creation. It is observed that while graphic design software offers opportunities to enhance teaching materials and engage students, educators may require further training and support to leverage these tools effectively. Martinez and Garcia's (2023) research highlights the importance of integrating graphic design skills into educators' professional development, emphasizing the role of tools like Canva in improving students' academic achievements.

Table 12: Distribution of Respondents' Technological Literacy in terms of Social Media

Indicators	**Mean**	**SD**	**Description**
As a teacher, I can. . .			
effectively use social media platforms to share educational resources and updates.	3.43	0.59	At All Times
engage with students and parents through appropriate social media channels.	3.39	0.60	At All Times
create and maintain a professional online presence on social media.	3.38	0.60	At All Times
utilize social media for collaborative learning and group discussions.	3.37	0.60	At All Times
integrate social media into lesson plans to enhance learning experiences.	3.37	0.61	At All Times
employ privacy settings and online safety measures when using social media for educational purposes.	3.39	0.59	At All Times
discern reliable and credible sources of information on social media.	3.37	0.56	At All Times
promote digital citizenship and responsible social media use among students.	3.40	0.57	At All Times
adapt to changes and updates in social media platforms for continued effective use.	3.38	0.57	At All Times
leverage social media for networking and professional development within the education community.	3.35	0.58	At All Times
Overall	**3.38**	**0.59**	**At All Times**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 12 presents the distribution of respondents' technological literacy in terms of social media with an overall mean rating of 3.38 (SD = 0.59), described as At All Times. The data emphasizes a high level of proficiency among educators in utilizing social media platforms for various educational endeavors. This proficiency is indicative of the evolving role of social media as a vital component in contemporary education. This is supported by Albiladi and Abdeen's (2021) study which delves into the efficacy of utilizing social media platforms for educational engagement. They found out that educators who effectively utilize social media platforms can enhance student engagement and facilitate collaborative learning experiences beyond the confines of the traditional classroom setting.

The indicator, As a teacher, I can effectively use social media platforms to share educational resources and updates, attained the highest mean rating of 3.43 (SD = 0.59) described as At All Times. This finding resonates with Smith and Brown's (2022) study, which emphasizes the importance of educators staying informed about current trends and leveraging social media to disseminate educational content efficiently. Through strategic use of social media platforms, educators can reach a wider audience and enhance access to educational resources, thereby enriching the learning experiences of students

On the other hand, the indicator, As a teacher, I can leverage social media for networking and professional development within the education community, obtained the lowest mean rating of 3.35 (SD = 0.58),described as At All Times. Despite being the lowest, it still signifies high literacy among the respondents' literacy in this indicator. In terms of professional development, the Department of Education typically employs platforms like Zoom or Google Meet for webinars and training sessions. Additionally, Gagalang's (2022) research underscores the significance of social media platforms as indispensable tools for achieving academic excellence.

Table 13: Summary Distribution of the Respondents' Level of Technological Literacy

Variables	Mean	SD	Interpretation
Video Conferencing	3.30	0.64	Highly Literate
Audio and Video Editing	3.30	0.67	Highly Literate
Microsoft Office Skills	3.41	0.66	Highly Literate
Graphic Design	3.31	0.65	Highly Literate
Social Media	3.38	0.59	Highly Literate
Overall	**3.34**	**0.64**	**Highly Literate**

Legend:
3.26-4.00 Strongly Agree/ Very Positive;
2.51-3.25 Agree/Positive;
1.76-2.50 Disagree/Negative;
1.00-1.75 Strongly Disagree/ Very Negative

Table 13 presents the summary distribution of the respondents' level of technological literacy. The overall mean rating is 3.34 (SD = 0.64) interpreted as Highly Literate. This underscores the proficiency of educators in utilizing technology to support teaching and learning practices. Teachers are undoubtedly making concerted efforts to adapt to the rapidly changing technological landscape. The findings align with studies such as those by Albiladi and Abdeen (2021) and Gagalang (2022), which emphasize the pivotal role of technology in modern education and highlight its effectiveness in enhancing instructional strategies and student engagement.

The variable, Microsoft Office skills, achieved the highest mean rating of 3.41 (SD = 0.66) interpreted as Highly Literate. This indicates that the variable holds significant utility within the field of education. It emphasizes the importance of Microsoft Office applications in educational settings, as highlighted by Hasanah and Dewi (2022). Their research highlights the necessity for educators to acquire proficiency in Microsoft Office 365 to facilitate more effective teaching and learning experiences. The high mean rating in this domain suggests that educators are adept at utilizing these tools to create instructional materials, manage administrative tasks, and enhance productivity in educational settings.

On the other hand, the variable, video conferencing, got the lowest mean of 3.30 (SD = 0.64), interpreted as Highly Literate. This suggests that teachers may not prioritize this literacy, given that video conferencing in public schools primarily occurs during webinars or virtual meetings rather than virtual classes for teachers and students. The relatively lower mean rating for video conferencing skills, despite still being in the "strongly agree" category, highlights a potential area for improvement in educational settings.

This finding resonates with Torrato *et al.* (2021), who emphasize the transformative potential of video conferencing in education, particularly in situations where physical presence is limited, highlighting its importance in facilitating distance learning and collaboration among educators and students.

Meanwhile, the variable, audio and video editing, also obtained the lowest mean rating of 3.30 (SD = 0.67), interpreted as Highly Literate. This finding suggests a potential area for improvement in educators' competence in audio and video editing, which are increasingly essential skills in modern educational settings. This aligns with the research of Smith *et al.* (2021), which emphasizes the importance of multimedia integration in education for fostering student engagement and comprehension. By providing educators with opportunities to enhance their audio and video editing skills, educational institutions can promote innovative teaching practices and improve learning outcomes.

Problem 4. Is There a Significant Difference in the Respondents' Technological Literacy and Their Characteristics?

Table 14: Test of Difference between the Teachers' Technological Literacy Level and Respondents' Characteristics

Teachers' Technological Literacy Level	Respondents' Characteristics									
	Sex		Position		Teaching Experience		Trainings Attended		Attitude Towards Computer Upskilling Trainings	
	p-value	Inter pretation	p-value	Inter pretation	p-value	Inter pretation	p-value	Inter pretation	p-value	Inter pretation
Video Conferencing	0.0065**	S	0.8559	NS	0.8299	NS	0.0094**	S	0.0253*	S
Audio and Video Editing	0.105	NS	0.7466	NS	0.7792	NS	0.0005**	S	0.0198*	S

Microsoft office skills	0.0274*	S	0.6548	NS	0.1209	NS	0.0004**	S	0.0001*	S
Graphic Design	0.2225	NS	0.7385	NS	0.8118	NS	0.0004**	S	0.0001*	S
Social media	0.088	NS	0.8709	NS	0.499	NS	0.0075**	S	0.0001*	S
Overall	**0.07188**	**NS**	**0.77334**	**NS**	**0.60816**	**NS**	**0.0254****	**S**	**0.0091***	**S**

Legend: Significant at p-value < 0.05 and p-value < 0.01**, S – Significant, NS – Not Significant*

Table 14 presents the outcomes of the Kruskal-Wallis analysis, which investigated the potential significant differences in teachers' technological literacy based on respondent characteristics, including sex, position, teaching experience, and attended trainings, using a significance level of 0.05.

The statistical analysis on the overall result revealed a significant relationship between attending trainings on social media and respondents' technological literacy, as indicated by a p-value of 0.0254. This rejection of the null hypothesis suggests that such training sessions have a discernible impact on educators' proficiency in utilizing social media platforms. Conversely, the non-significant p-values for the remaining variables indicate that there is insufficient evidence to reject the null hypothesis, implying that factors other than training attendance may influence respondents' proficiency in those areas.

The results indicated the rejection of the null hypothesis regarding sex concerning video conferencing and microsoft office skills, as the p-values were less than 0.05. This provides compelling evidence supporting a significant difference between sex in terms of video conferencing and microsoft office skills, with a 99% confidence level. Therefore, it can be confidently asserted that 80.8% of females significantly contributed to teachers' technological literacy in video conferencing and microsoft office skills.

Furthermore, there was also the rejection of the null hypothesis regarding attended trainings and all aspects of teachers' technological literacy, as the p-values were less than 0.05. This implies a significant difference between attended trainings and teachers' technological literacy in video conferencing, audio and video editing, microsoft skills, graphic design, and social media, with a 99% confidence level. Consequently, it can be confidently stated that 71.2% of participants who attended 1 to 3 related trainings and seminars significantly contributed to teachers' technological literacy.It is important to note that no significant difference was observed in demographic characteristics concerning teaching experience and position toward teachers' technological literacy, as the p-values were greater than 0.05. This indicates that teaching experience and position do not significantly contribute to teachers' technological literacy.

Moreover, the outcomes of the Kruskal-Wallis analysis shed light on the nuanced interplay between demographic factors and professional development opportunities in shaping educators' technological competencies. While significant differences were observed in technological literacy concerning sex and attended trainings, no such variations were evident in teaching experience and position. This underscores the importance of tailored strategies to promote digital proficiency among teaching professionals, as highlighted in the study of Pentury and Anggraeni (2022).

Additionally, the rejection of the null hypothesis for attended trainings emphasizes the pivotal role of professional development initiatives in enhancing educators' technological literacy across various domains, as emphasized by Bayucca (2020) and Movitaria and Shandra (2022). These findings collectively underscore the need for targeted interventions to bridge the digital divide among educators and ensure equitable access to technology-enhanced learning experiences.

Moving forward, educational institutions must prioritize the implementation of comprehensive professional development initiatives, as advocated by Hasanah and Dewi (2022), to ensure that all educators are equipped with the requisite technological competencies to thrive in today's digital learning landscape. Additionally, fostering a culture of continuous learning and innovation, as emphasized by Undersecretary Alain Del B. Pascua's Aide Memoire (2020), is essential to sustainably elevate educators' technological proficiency and, by extension, improve the quality of teaching and learning experiences for all stakeholders involved.

Problem 5. Is There a Significant Relationship between the Respondents' Computer Upskilling Trainings and Their Technological Literacy?

The results presented in Table 15 shed light on the intricate interplay between computer upskilling attitudes and teachers' technological literacy across various domains, including audio and video editing and social media. The examination of computer upskilling training concerning education in a virtual environment unveils another layer of this intricate relationship. With p-values falling below 0.05, it is evident that training initiatives aimed at enhancing educators' skills in navigating virtual learning environments have a discernible impact on their proficiency in video conferencing and social media utilization (Pentury & Anggraeni, 2022). This substantiates the pivotal role of tailored training programs in equipping teachers with the requisite skills to effectively leverage technology for instructional purposes, particularly in virtual settings.

Furthermore, the significant relationship identified between information and communication technology and teachers' technological literacy further underscores the multifaceted nature of this phenomenon. With p-values signaling statistical significance at a confidence level of 99%, this finding highlights the integral role of

Table 15: Test of Relationship between the Computer Upskilling Trainings and Teachers' Technological Literacy Level

Teachers' Technological Literacy Level	Computer Upskilling Trainings											
	Innovation in Education			Education in Virtual Environment			TV-Based			ICT		
	rho	p-value	Inter pretation	rho	p-value	Inter pretation	rho	p-value	Inter pretation	rho	p-value	Inter pretation
Video Confe-rencing	-0.079	0.21	NS	0.221	0.0004**	S	0.11	0.078	NS	0.56	0.0001**	S
Audio and Video Editing	-0.089	0.161	NS	0.118	0.077	NS	0.078	0.224	NS	0.543	0.0001**	S
Microsoft office skills	-0.084	0.183	NS	0.023	0.716	NS	-0.021	0.74	NS	0.48	0.0001**	S
Graphic Design	-0.11	0.085	NS	0.119	0.06	NS	0.08	0.21	NS	0.48	0.0001**	S
Social Media	-0.046	0.47	NS	0.127	0.045*	S	0.085	0.17	NS	0.64	0.0001**	S
Overall	**-0.0816**	**0.2218**	**NS**	**0.1216**	**0.17968**	**NS**	**0.273**	**0.2844**	**NS**	**0.5406**	**0.0001****	**S**

Legend: Significant at p-value < 0.05 and p-value < 0.01**, S – Significant, NS – Not Significant*

ICT proficiency in shaping educators' competence across various technological domains, spanning from video conferencing and audio-video editing to Microsoft skills, graphic design, and social media utilization (Hasanah & Dewi, 2022). This comprehensive understanding underscores the necessity of equipping educators with robust ICT competencies to navigate the increasingly digitized landscape of education effectively.

Problem 6. Based on the Findings of the Study, What Technology Skills Enhancement Plan on Computer Upskilling Can be Designed?

Table 16: Matrix of Technology Skills Enhancement Plan

Areas of Concern	Specific Objectives	Strategies/ Activities	Time Frame	Person Involved	Source of Fund	Estimated Budget	Expected Output
Record and share video conference sessions for review	Enable educators to proficiently record and share video	Conduct training sessions on video conferencing tools Organize hands-on workshops Establish a peer mentoring program	April 2024 3 Days	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts	Division MOOE/ Special Education Fund (SEF)	Php 50,000	Educators are equipped with skills to record, share, and review video conference sessions Submitted learning outputs

Synthesis of audio and video components for multimedia materials	Year 2	Troubleshoot common technical issues during video conferences	The ability to create engaging content for TV and radio broadcasts	Leverage social media for networking and professional development	Integrate Outlook for efficient email and calendar management
Enhance teachers' ability to synthesize audio and video		Equip educators with skills to troubleshoot common technical issues during video conferences	Develop educators' skills in creating compelling content for TV and radio broadcasts	Enable educators to effectively utilize social media	Equip educators with skills to utilize Outlook effectively
Provide workshops on audio and video editing software Conduct hands-on training sessions Collaborate with multimedia experts for guidance and support		Conduct simulation exercises for troubleshooting technical problems. Offer refresher courses on video conferencing platforms' troubleshooting features.	Provide training on storytelling techniques for broadcast media. Organize guest lectures by industry professionals in broadcasting.	Organize seminars and webinars on leveraging social media for professional growth and networking Host live Q&A sessions or panel discussions Facilitate online forums or discussion groups	Conduct training sessions on Outlook features and functionalities Develop interactive online modules or tutorials Implement a buddy system
January 2025 5 Days		Novem-ber 2024 3 Days	October 2024 3 Days	September 2024 3 Days	July 2024 3 Days
Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts		Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts
Division MOOE/ Special Education Fund (SEF)		Division MOOE/ Special Education Fund (SEF)	Division MOOE/ Special Education Fund (SEF)	Division MOOE/ Special Education Fund (SEF)	Division MOOE/ Special Education Fund (SEF)
Php 100,000		PHP 25,000	PHP 20,000	PHP 20,000	Php 80,000
Educators become capable of integrating audio and video elements into multimedia educational materials Submitted learning outputs		Educators become capable of diagnosing and resolving common technical issues during video conferences	Educators become proficient in creating engaging content for TV and radio broadcasts	Educators become adept at using social media platforms for networking and professional development Submitted learning outputs	Educators become proficient in managing emails and calendars using Outlook Submitted learning outputs

Leverage social media for networking and professional development	Year 3	Create and manage databases in Microsoft Access	Effectively manage large groups in video conferences	Skills in adapting teaching methods for online platforms	Create custom graphics for educational purposes
Enable educators to effectively utilize social media		Develop educators' proficiency in creating and managing databases using Microsoft Access	Enhance educators' capacity to manage large groups in video conferences	Enhance teachers' capability to adapt teaching methods	Develop teachers' capacity to create customized graphics
Organize seminars and webinars on leveraging social media for professional growth and networking Facilitate online communities of practice for educators Provide ongoing support and resources through social media channels		Offer step-by-step tutorials on database design and implementation. Provide case studies or real-world scenarios for hands-on database management practice.	Organize workshops on facilitation techniques for virtual meetings. Provide training on interactive tools for engaging large audiences in virtual settings.	Conduct workshops on online teaching strategies and tools Facilitate peer learning circles Implement action research projects on virtual instruction	Offer workshops on graphic design tools and principles Provide one-on-one coaching sessions Establish a resource library for design inspiration
January 2026 3 Days		August2025 3 Days	June2025 3 Days	May 2025 4 Days	March 2025 5 Days
Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts		Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts
Division MOOE/ Special Education Fund (SEF)		Division MOOE/ Special Education Fund (SEF)	Division MOOE/ Special Education Fund (SEF)	Division MOOE/ Special Education Fund (SEF)	Division MOOE/ Special Education Fund (SEF)
Php 50,000		PHP 30,000	PHP 20,000	PHP 80,000	PHP 100,000
Educators become adept at using social media platforms for networking and professional development Submitted learning outputs		Educators become capable of creating and managing databases in Microsoft Access	Educators become proficient in managing large groups in video conferences	Educators become proficient in adapting teaching methods for online platforms, ensuring effective virtual instruction Submitted learning outputs Action Research	Educators become skilled in designing custom graphics for educational materials Submitted learning outputs

Audio and Video Editing	Use graphic design software (e.g., Canva, Photoshop, etc.)	Collaborate on documents through OneDrive or SharePoint	Ability to troubleshoot common ICT issues in educational settings			
Enhance educators' proficiency in audio and video editing	Develop educators' skills in using graphic design software for educational purposes	Enhance educators' ability to collaborate on documents using OneDrive or SharePoint	Equip educators with skills to troubleshoot ICT issues			
1. Offer specialized workshops on advanced editing techniques. 2. Facilitate peer feedback sessions for improving editing skills.	1. Provide advanced training sessions on specific graphic design tools. 2. Establish online forums or communities for sharing design tips and tricks.	1. Conduct interactive workshops on collaborative document editing features. 2. Facilitate group projects requiring collaborative document creation and sharing.	Provide hands-on training sessions on troubleshooting common ICT issues in educational settings Develop troubleshooting guides and resources for educators Establish a helpdesk or support system for timely assistance			
Septem-ber 2026 5 Days	July 2026 4 Days	May 2026 3 Days	March 2026 5 Days			
Multimedia Specialists, Teachers	Graphic Design Instructors, Teachers	IT Specialists, Teachers	Division ICT Coordinator District ICT Coordinators School ICT Coordinators Invited Experts			
DepEd Budget	DepEd Budget	DepEd Budget	Division MOOE/ Special Education Fund (SEF)			
PHP 80,000	PHP 40,000	PHP 15,000	Php 100,000			
Educators become skilled in audio and video editing techniques	Educators become proficient in using graphic design software for educational purposes	Educators become adept at collaborating on documents through OneDrive or SharePoint	Educators become capable of diagnosing and resolving common ICT issues encountered in educational settings Submitted learning outputs			

CONCLUSIONS

Based on the results and discussions that have been presented, the following conclusions were made:

There are noticeable differences in technological proficiency among educators in the First Legislative Districts of Misamis Oriental, with gender and participation in training sessions emerging as significant factors. Women tend to excel in video conferencing and Microsoft Office, indicating potential gender-based gaps in tech skills. Attending training sessions enhances educators' proficiency in various areas, underlining the importance of professional development in improving technological literacy. Positive attitudes toward computer upskilling correlate with better multimedia content creation and social media usage skills, suggesting that proactive learning enhances educators' ability to enrich classroom activities and engage students. Cultivating a culture of continuous learning and innovation among educators is crucial to adapt to evolving educational paradigms, emphasizing the central role of technology in education. These findings stress the necessity for targeted interventions and ongoing support to meet educators' diverse needs and ensure equitable access to technology, ultimately fostering a culture of digital innovation in education.

RECOMMENDATIONS

In accordance with the findings and conclusion of the study, the following recommendations are hereby presented:

1. Teachers may attend computer upskilling training since staying abreast of technological advancements

and enhancing their effectiveness in the classroom is imperative.

2. Teachers need to enhance their skills in troubleshooting common ICT issues in educational settings, which is paramount to ensure seamless delivery of instruction and minimize disruptions during teaching sessions.

3. School administrators may prioritize organizing comprehensive training sessions focused on video conferencing, audio and video editing, specifically tailored to equip teachers with the skills needed to troubleshoot common technical issues during video conferences and effectively manage large groups in such settings.

4. School administrators may investigate the effectiveness of different training modalities, such as online courses, workshops, and mentoring programs, which can provide insights into the most beneficial approaches for enhancing educators' technological skills.

5. Educational institutions should design and implement comprehensive training programs that specifically target the enhancement of educators' skills in video conferencing and social media utilization within virtual learning environments.

6. It is recommended to utilize the technological skills enhancement plan, crafted based on the findings of the study, as a foundational framework for ongoing professional development initiatives for educators.

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