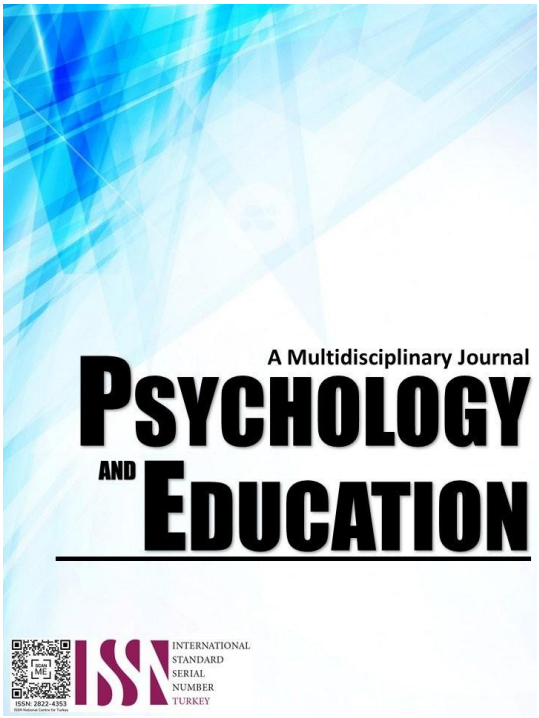
INTEGRATION OF CONTEMPORARY TEACHING AND DIGITAL LITERACY AMONG GRADE 12 ICT STUDENTS



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Research Article

Integration of Contemporary Teaching and Digital Literacy Among Grade 12 ICT Students

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Abstract

The researcher aims to identify the significance and relationship of the integration of contemporary teaching and digital literacy among Grade 12 ICT students. This study employed a descriptive-correlational design to investigate the role of integrating contemporary teaching and digital literacy among trade 12 ICT students. The contemporary teaching focused on and analyzed specific areas, such as technological integration, interactive instruction, and student-centered learning, while digital literacy was observed through technical, cognitive, and ethical skills. With the Grade 12 ICT students from a private school in Region IV-A, Rizal Province, as respondents, purposive sampling was utilized to select all available students (n=80). Descriptive statistics, specifically frequencies and percentages, were calculated to present the distribution of responses across the various survey items. Furthermore, mean scores and standard deviations were computed to assess the central tendency and the degree of variability in the students' responses for each of the identified areas within contemporary teaching and digital literacy. To determine the strength of the relationships between the variables, the correlational analysis was conducted and evaluated at .05 level of significance. The study revealed that the ICT students' respondents consistently perceived the integration, with mean scores ranging from 3.50 to 4.49, indicating a general agreement (Integrated) with contemporary teaching approaches. The mean scores, ranging between 3.50 and 4.49, signified a predominantly confident stance on their digital literacy skills. The analysis presented no correlations that reached statistical significance at the 0.05 level of significance; therefore, it is partially not sustained in assessing the correlation between the respondents' perceptions of contemporary teaching and digital literacy. Moreover, between the integration of contemporary teaching and digital literacy and the respondents' technical and cognitive skills, the result is sustained, as none of the examined correlations reached statistical significance at the 0.05 level of significance.

Keywords: *Contemporary Teaching, Digital Literacy, Digital Literacy Skills, ICT*

Introduction

Encouraging students to use digital media will enable them to acquire the knowledge, abilities, and character traits they need to thrive in the digital age and contribute to society (Redmond, 2015). However, adopting digital literacy skills to improve quality is a fundamental problem for the digital learning environment (Techataweewan & Prasertsin, 2018). Integrating digital literacy skills into the curriculum requires careful planning and coordination across subject areas, which can be challenging due to existing academic structures and priorities. In a rapidly changing digital landscape, students need to develop adaptability and a willingness to learn new approaches throughout their lives. Digital literacy education should cultivate a growth mindset, resilience in the face of technological change, and the ability to self-direct their learning journey. Addressing these challenges and concerns requires a holistic approach that involves collaboration among educators, policymakers, parents, and technology experts. By fostering a collaborative partnership between students and educational institutions, both parties can work together to cultivate a culture of digital literacy that empowers students to thrive in a technology-driven world, where raising awareness of the importance of preparing students for success in the digital age is highly prioritized. With the various challenges emerging in this era, educational institutions and stakeholders must have a clear and feasible vision of how they envision the students and the environment in the future.

As the Department of Education (DepEd) reports, the institution must collaborate closely with stakeholders, adopting a whole-of-society approach to increase Filipino literacy, numeracy, and digital competencies. The collaboration between institutions and stakeholders is crucial for addressing complex issues and achieving common goals effectively. Whether it's in the realm of government, business, academia, or community initiatives, bringing together diverse perspectives, resources, and expertise can lead to more innovative solutions and better outcomes. Although many schools still struggle to move away from lecture-based instruction, the traditional and archaic form of education, a shift toward more contemporary and innovative teaching techniques could support curriculum development with improved norms (Zemsky & Banning, 2013). Although some schools cannot fully adopt and manage the norms of contemporary approaches, they still have the responsibility and commitment to keep up with trends. This initiative is not only for the sake of being updated but rather an act of incorporating various elements of technology and innovation into the educational system.

Two of the five focuses of MacDougall & Squires's teachers' professional development are the integration into existing curricula, and the other is transforming the curricula related to the use of IT. These two validate contemporary teaching as they offer curricula and an introduction to visualizing education for the 21st century. Education is a dynamic field, and teachers play a crucial role in adapting to the changing needs of students. As the learning environment evolves, teaching strategies must adapt to meet the needs of today's students. If no approaches can eliminate the discrepancy between the planned learning objectives and the results of a digital education environment for teaching and learning, integration fails (Knezek & Roblin, 2015). That is why many educational institutions have been

exploring contemporary techniques in their curricula to address the aforementioned concern and develop an approach that meets the demands of current trends (Oliver, 2017). However, despite efforts to implement various approaches in schools, it remains challenging to engage students in new classroom activities. There is no doubt about this observation since implementing a new strategy or approach is a real challenge not only in education but in all different settings. However, by continually exploring and implementing innovative approaches, teachers can create engaging and effective learning environments that meet the emerging needs of students in today's rapidly changing world.

Introducing contemporary elements into traditional teaching settings may have unintended consequences, such as increased competition among students, an unequal distribution of rewards, or a reinforcement of extrinsic motivation over intrinsic learning. Traditional teaching methods may not effectively capture the skills and competencies developed through gameplay, making it challenging to measure learning outcomes accurately. In addition to the traditional literacy and numeracy measures of education, society now demands that students possess a wide range of technological, creative, dynamic, and social competencies in order for them to flourish in the modern world in ways that are more engaged, flexible, and open than ever before (Goodwin, 2020).

With the incorporation of technology into the educational setting, teachers are given new opportunities to innovate their teaching techniques, stay updated on emerging technologies and trends in ICT, and explore advanced learning environments established for students to overcome learning challenges, develop their competencies, and incorporate innovative approaches into their teaching. They have the power to integrate a variety of technology tools and platforms, focusing on creativity, collaboration, and critical thinking, while providing hands-on experience. The ICT strand equips students with various communication and information-sharing capabilities to enhance their digital literacy, aiming to provide them with the necessary skills and knowledge to thrive in a technology-driven society. Students may gain extensive knowledge of computer systems, programming, website development, and basic animation, fostering a mindset of adaptability and lifelong learning. This prepares students to continuously update their skills and adapt to emerging technologies throughout their careers. With this aim and goal in mind, the researcher is interested in studying the impact of integrating contemporary teaching and digital literacy among Grade 12 ICT students.

Research Questions

The focus of the study is to investigate the impact of integrating contemporary teaching and digital literacy among Grade 12 ICT students. Specifically, this sought to answer the following questions:

1. How do ICT students' respondents perceive the integration of contemporary teaching in terms of:
    1.1. technological integration;
    1.2. interactive instruction; and
    1.3. student-centered learning?
2. How do the respondents describe their digital literacy in terms of:
    2.1. technical;
    2.2. cognitive; and
    2.3. ethical skills?
3. What is the ICT performance of the respondents as to:
    3.1. technical; and
    3.2. cognitive?
4. Are the perception of the respondents on contemporary teaching and digital literacy significantly related?
5. Does the integration of contemporary teaching significantly related in terms of:
    5.1. technical skill; and
    5.2. cognitive skill?

Literature Review

Digital Literacy in the ICT Domain

Caputo et al. (2021) highlight the strategic administration literature's specific emphasis on digitalization as one of the most common organizational responses to the rapid changes in industries and technology. The academic literature generally addresses the challenges of transitioning teams from traditional to online settings; however, a gap remains in this domain (Vuchkovski, 2023).

Numerous studies emphasize the importance of digital literacy for ICT students. Feijao et. al (2021) analyze the supporting data and information for utilizing a range of the present digital competencies landscape, with a primary focus on the inconsistency in digital skills.

Digital literacy has been defined and analyzed by various literatures as being able to use information and communication technologies to locate, assess, produce, and share information, integrating both intellectual and practical skills by the American Library Association (ALA), a set of connected abilities or competencies necessary for success in the digital age (List, 2019), and a regular user of the obtained proficiency in technology, a consistent information seeker, an analyst and critic, and good in communication (Hassan & Akbar, 2020). When it comes to using technology as a means of communication in society, digital literacy is a particularly crucial

ability (Sigit, 2021).

Digital literacy skills, specifically for ICT students, encompass factors such as data visualization, the use of office productivity tools, data retrieval, and ethical online conduct. Jan (2018) presented to the students the skills in technology and anticipated their behavior towards ICT.

Voogt and Roblin (2012) examine the consequences of global frameworks for 21st-century competencies, such as digital literacy, for national curriculum plans. The study sheds light on how modern curriculum creation and teaching strategies include digital literacy.

Moreover, Tinmaz (2022) highlighted the following various kinds of digital skills: (a) technological (by utilizing technological tools); (b) cognitive (using intellect while processing information); and (c) social (interacting with others and communicating).

Contemporary Teaching Impact on Learning

Even while students may directly seek to acquire knowledge, the teacher's support and assistance have a substantial effect on student learning (Johnson, D., 2017). Additionally, teachers may view and react differently to their students' motivation and involvement, which can impact student achievement (Brandmiller et al., 2023). Monteiro et al. (2021) identified that, regardless of how they personally felt about the feedback they received from teachers, students showed higher levels of behavioral engagement and school identification in classrooms where teachers employed more effective forms of feedback to foster a supportive learning environment.

By incorporating modern skill sets, developments, and technologies, contemporary approaches make education more applicable to students' daily lives. Based on Pana and Escarlos (2017), a technology-based approach to teaching is a successful way to improve 21st-century abilities, such as digital literacy, collaboration, teamwork, critical thinking, and innovative thinking. This association may enhance motivation and engagement (Hamari & Koivisto, 2014). When students are actively engaged and given an educational opportunity, they participate willingly in discussions, especially those focused on gaining knowledge, and directly contribute to the class (Tyunnikov, 2017).

As cited by Oropeza et al. (2017), educational institutions need to be equipped to respond to the need for new professionals and career fields. He believes that in future generations, technology will make a more tailored curriculum possible. This will focus on utilizing suitable pedagogical strategies and procedures to support effective learning, understanding the course material, and maintaining an objective perspective regarding the quality of knowledge provided to students (Palomino et al., 2023).

Students need to learn and acquire skills that are relevant in today's ever-changing environment. The 21st-century skills, such as critical thinking, problem-solving, collaboration, and digital literacy, are frequently highlighted in modern approaches. For certain students, traditional teaching methods might not always be effective. This approach requires flexibility, enabling teachers to modify and tailor their instruction to meet the needs of a diverse range of students. In particular, students of all types become accustomed to the practical use of portable technology in contemporary educational settings. This transformation implies a personalized program and its impact for modern teaching and learning (Onwubiko, 2024).

Onwubiko also stated that a contemporary learning environment should ideally consist of these three fundamental components. These include audiovisual equipment such as projectors and touch-screen displays, interactive gadgets like laptops, tablets, and mobile devices, as well as functional furniture like elevated desks, collaborative work areas, and connected chairs that enable students to gain knowledge in various ways at different times.

The ability to use and operate devices and methods, including computers, cellphones, and smartboards, as well as the ability to use, assess, and produce digital information, should be the focus of digital literacy. (Majumdar, 2024).

The NMC Horizon Report presents new developments and trends in K–12 education. It addresses modern teaching approaches, including personalized learning, blended learning, and the use of digital resources, highlighting how these approaches can increase student achievement and engagement (Johnson & Becker, 2014).

Contemporary Pedagogical Approaches in ICT Education

Research from Sabbah and Sabbah (2022) states that to strengthen digital literacy and develop stronger digital skills, students and teachers should employ several instructional methods.

When it comes to overcoming the shortcomings, modern approaches have certain benefits.

● Interactive Learning: Students can develop and improve digital literacy skills in an engaging environment by being involved in contemporary activities that reflect real-world activities (Ammon, 2013).

● Project-Based Learning (PBL): Thomas (2014) stressed that PBL is a significant approach in developing student engagement and collaboration, project management, and enhancing task outcomes.

● Inquiry-Based Learning: In this approach, the most common examples are the online software, simulations, and tools for data visualizing that help students to accomplish their research, evaluate and interpret data, and develop cognitive thinking skills (Dede, 2016).

● Personalized Learning: To cater to the various types of students' learning, online platforms can offer flexible activities and challenges, relevant activities, and feedback systems (Sailer et al., 2017).

● Skill-Specific Learning: According to Liu et al. (2018), modern tasks can be tailored to focus on developing or enhancing particular digital literacy abilities specifically

● Blended learning: It aims for high student involvement, promotes learning outcomes, and provides teachers and students with more opportunities (Stacey et al., 2018).

Chugh et al. (2023) focused on the need to investigate how technology affects the preparation and implementation of the educational landscape in various subject areas and serves as a key to education.

Students are seeking to utilize technologies due to their engaging mechanism, but at the same time, it enables teachers to develop effective project-research activities and apply digital components in the learning process (Gerasimova et al., 2023). To create a more engaging and effective learning environment for all types of students, further study should focus on the long-term impacts of these strategies on student learning outcomes, identify the difficulties in accessing technology, and seek a more contemporary approach to integrating technology into the educational curriculum.

The Need for Further Study

By studying the significant relationship between contemporary teaching and ICT students' digital literacy, this research aims to identify the role of the variables used and serve as a reference for researchers specializing in digital literacy. This study will provide fresh and relevant information on contemporary teaching approaches and digital literacy skills in the 21st century. The findings of the study will supplement the needs of educators and academics in catering to the variety of students, improving their learning outcomes, and developing the skills needed in the digital era.

With the study's focus on both teachers and students, it can provide teachers with significant information on how to develop and implement various modern learning methodologies in ICT education. The findings can serve to effectively implement professional development programs for teachers by integrating technology and modern teaching methods, guide the utilization of more interactive and efficient ICT courses, and supplement the distribution of resources to facilitate digital educational environments.

Furthermore, this study can serve as a starting point for further research into how modern instruction and digital literacy impact a broader range of outcomes, including student engagement, motivation, and skills. Future studies should also examine how specific variables, such as socioeconomic status, technological accessibility, and teacher attributes, influence the relationship between modern instruction, digital literacy, and student learning outcomes.

Digital Literacy and Contemporary Teaching

Modern educational concepts, theories, and technological advancements have had a significant impact on the educational system (Cheung et al., 2021). Through informal and expanded opportunities for learning using the internet and emerging online platforms, such as social media and other educational websites, these technologies enable students to expand their learning process beyond traditional educational institutions (Saykili, 2019). With engaging methods for fostering and improving digital literacy, innovative platforms can prove to be an effective tool.

As cited by Mokhtari (2023), it is apparent that any school system that fails to promote digital literacy and integrate it into the curriculum does not provide students with the skills they need to succeed in today's technologically sophisticated global environment.

According to Bansal (2023), technology is the modern equivalent of pen and paper and should be present in every classroom. In agreement with this, Marín et al. (2023) suggest that technology, attitude, and cognitive elements are all integral to digital literacy, which is closely tied to people's desire to convey, investigate, question, converse, and comprehend ideas in various contexts. Although students are already familiar with using digital technology in education (McKnight et al., 2016), these digital literacy frameworks and models will serve as a foundation for assessing digital literacy techniques that are appropriate for students to learn in the digital age.

Traditional educational instruction falls short of offering greater engagement, quick assessments, and an intuitive educational setting. On the other hand, technology and digital instructional resources alleviate this gap (Abid et al., 2022). Incorporating technology into instructional methods enhances the quality of education and yields significant improvements in teaching aspects (Ghavifekr et al., 2015). This approach also enables students to grow as learners, become more motivated, and acquire skills and knowledge more effectively (Akram et al., 2022). Blasco-Ruiz et al. (2020) explore various frameworks and approaches for using technology effectively to enhance student learning across different disciplines. Therefore, teachers must embrace and learn to navigate technological resources (Wong et al., 2021) and modern teaching approaches to support students in acquiring 21st-century abilities, as well as play a vital part in this process (Garba et al., 2015). The use of ICT in education should take into account teacher skills and knowledge in addition to the tools, materials, and techniques. (Quaicoe & Pata, 2020; Fields & Hartnett, 2018; Yuen et al., 2020).

In contemporary teaching, Ertmer and Dawson (2018) provide an in-depth analysis, outlining the main issues and barriers that hinder teachers' readiness for digital learning settings. Moreover, Yuen et al. (2020) elaborate on how significant it is for teachers to utilize

and adapt technology to develop and implement various effective teaching methods. To support the statement, Voogt et al., (2018) study mentioned the important role of the preparation programs for the teachers to be capable and knowledgeable in the incorporation of how important it is for teacher preparation programs to give aspiring teachers the abilities and know-how to incorporate digital tools and resources into their lessons successfully.

Student Perceptions to Contemporary Teaching

According to studies, students prefer interactive and engaging teaching strategies over conventional lecture-based methods, such as inquiry-based learning, project-based learning, and problem-based learning (Kokotsaki, 2017). These modern methods foster critical thinking, active learning, and a deeper understanding of the course material.

Dahalan & Shaharom (2024) highlighted that being concentrated and fully engaged in the learning process can greatly enhance a student's experience and boost their engagement, resulting in improved learning efficiency (Lai et al., 2018). Given that students have a variety of learning styles, researchers have explored how learning methods can be tailored to meet the needs of each student.

The concept of contemporary skills represents a shift that captivates various sectors (Nelson, 2012), with education being at the forefront among these fields (Sailer & Homner, 2020) and applied across all educational levels, from primary to higher education (Hishamuddin et al., 2018). Students now have greater exposure to a broader range of data and resources at hand (Jan, 2017), and the instructional needs of teachers must be prioritized to enhance their practice (Guerriero, 2014).

Van Eck (2014) addresses the possible advantages of connecting learning types with certain modern aspects, while Liu et al. (2017) offer a paradigm for combining modern approach with various learning styles. One example is project-based learning, which exhibits greater levels of innovation, teamwork, and problem-solving capacity than students in traditional classes (Thomas, 2014).

Furthermore, student-centered approaches, such as flipped classrooms and personalized learning, accommodate a variety of learning preferences and enhance independence among learners, as well as facilitate self-paced learning (Lage, et a., 2000).

Student Perceptions to Digital Literacy

Despite the narrow focus on ICT students, some studies indicate a beneficial association between digital literacy and wider educational environments, as they recognize its significance for academic and future career goals (Livingstone, 2018) and offer a high possibility of taking initiative in building their skills (Bennett et al., 2014). For instance, students who perceive themselves as digitally literate are more inclined to engage with online activities and cultivate a positive attitude toward technology (Leu et al., 2014), while those who are not are more likely to experience an inferiority complex when utilizing technology for educational purposes (Selwyn, 2018).

Numerous studies emphasize the beneficial relationship between students' use of information technology for educational purposes and their engagement with the curriculum and teachers (K. Kiuru, 2019), as it facilitates meaningful learning. As Hobbs (2017) and Costley (2019) cited, when students accumulate media for their educational tasks, they have the opportunity to integrate play and learning, leading them to become more active and learn in various ways that fit into the curriculum as well.

On the other hand, students' evaluations of their own digital literacy skills vary depending on factors such as financial status, technological accessibility (Selwyn, 2018), and motivation, alongside prior experiences (Mishra & Koehler, 2014).

Interdisciplinary Applications of ICT

In relation to ICT, comprehensive studies have scrutinized and discovered connections with cybersecurity (Abu-Nimah, 2020), information literacy (Al-Emran et al., 2019), and mobile application development abilities (Huang & Liu, 2018). For instance, knowledge in networking, data security, and ethical hacking is essential and a requirement for cybersecurity education, which is associated and relevant to ICT. Similarly, the effective use of ICT resources and navigating the digital world requires information literacy skills. Additionally, ICT education provides the fundamental information and skills required to develop online or mobile applications, including design, programming, and user experience.

More studies have assessed how ICT and new technologies, including virtual and augmented reality (VR/AR) (Billinghurst, 2013) and artificial intelligence (AI) (Hao et al., 2020), are associated with functions that vary from intelligent tutoring systems to personalized learning platforms. Artificial Intelligence (AI) plays a big role in ICT education. Through immersive learning experiences enabled by new technology and platforms, students can explore digital environments, participate in online simulations, and develop their spatial reasoning skills—all key aspects of ICT education.

In ICT education, research is crucial for identifying the factors or variables that are most beneficial for the development of various skills. These consist of:

● Information retrieval: In this factor, students are required to analyze, compare, and seek the data and information acquired from the internet or online platforms.

● Information analysis: In this factor, students need to learn how to analyze and synthesize the acquired data and information, and evaluate the credibility of the resources.

● Ethical online conduct: In this factor, students must know responsible use of technology, the safety in accessing online content, and a sense of digital citizenship.

Methodology

Research Design

This study employed a descriptive-correlational approach to analyze the relationship between the integration of contemporary teaching and digital literacy among Grade 12 ICT students. Descriptive-correlational analysis was used to investigate and discuss the role of contemporary teaching approaches in the development of digital literacy among ICT strand students. By evaluating how teaching instructions influence the relationship between students' perceptions, this research design provided valuable insights into the driving factors of learning outcomes in the digital era.

Respondents

The study employed purposive sampling to select all eighty (80) Grade 12 Senior High School ICT students from a private school in Region IV-A, Rizal Province, as respondents. Considering the potential restrictions associated with coordinating with senior high schools and students individually, this method presented an effective means of data collection from a representative sample.

Instrument

The researcher of this study used a self-constructed survey questionnaire specifically designed for the Grade 12 ICT students consists of five parts mainly: Profile of the Respondents, Contemporary Teaching including 15 items for the technological integration, interactive instruction, and student-centered learning, and the Digital Literacy skills comprises 15 items for the perception measured through Likert scale and 20 items multiple-choice type of questions for the performance areas focused on the technical, cognitive, and ethical skills.

Validation of the survey questionnaire was conducted by 14 Master Teachers from a Public High School in Quezon Province, which was then pilot-tested face-to-face on 20 students selected through purposive sampling, with reliability measured using Cronbach's Alpha.

Procedure

This study focused on how students' digital literacy skills change when contemporary teaching methods are integrated into classrooms. To accomplish this, the study conducted the following phases.

The initial research design and communication are the main priorities of this phase. This entails a written formal letter outlining the study objectives to the school administration. Gave a brief explanation of the teaching approaches and possible advantages for enhancing students' digital literacy. Indicated clearly that the plan to conduct a study within the school and list the possible advantages for the institution as a whole, including increased student engagement, the creation of creative teaching strategies for ICT teachers, and a boost to the school's standing as an innovator in educational technology.

After receiving approval from the school principal, the selection process with a sample population of 80 Grade 12 Senior High School ICT students is as follows. The researcher sought guidance from the ICT teacher on the process. After finalizing the list of respondents, the administration of survey questionnaires was conducted.

Data Analysis

The data collected from the questionnaire administered ftoGrade 12 senior high school ICT students was analyzed using descriptive statistics.

Frequencies and percentages are calculated to determine the distribution of responses for each item relevant to the integration of contemporary teaching methods, students' perceptions of digital literacy in contemporary teaching, and their performance in technical and cognitive skills. Mean scores and standard deviations are applied to assess the central tendency and variability of student responses in each area. Then, a correlation analysis was applied to assess the relationship between students' perceptions of contemporary teaching approaches and digital literacy, as well as the relationship between the integration of contemporary teaching and digital literacy and student performance in technical and cognitive skills at a 0.05 level of significance.

Ethical Considerations

In this study, the researcher was guided by the following ethical considerations:

Confidentiality. The researcher ensured the confidentiality of the respondents by not requiring them to input their personal information in the questionnaires. Since the respondents were Grade 12 Senior High School students, aged 15-19 on average, only the students' responses in the survey were needed.

Vulnerability. Participation in this study was voluntary, and students had the option not to participate. They were asked to sign a consent

form and were free to withdraw even without stating a reason.

Results and Discussion

This section presents the statistical analysis of the data obtained, its interpretation, and key findings.

Table 1. *ICT students' perception on the technological integration of contemporary teaching*

	Indicators	*Mean*	*Interpretation*
1.	The ICT teacher uses technology to develop thinking skills.	4.26	Integrated
2.	The use of online platforms and digital tools in the ICT class is very helpful for learning and practicing new skills.	4.21	Integrated
3.	The ICT teacher presented various technologies, such as simulations, videos, and online resources.	3.91	Integrated
4.	The use of technology in the ICT class is essential for preparing the students for this digital world.	4.06	Integrated
5.	The use of technology in ICT class enhances engagement and motivation.	4.21	Integrated
		3.83	Integrated

Legend: 4.50 – 5.00 Highly integrated; 3.50 – 4.49 Integrated; 2.50 – 3.49 Moderately integrated; 1.50 – 2.49 Low integrated; 1.00- 1.49 Not integrated

Table 1 presents ICT students' perception on the technological integration. As cited by Nurzhanova et al. (2024), the integration of technology is a prominent digital innovation shaping the landscape of 21st-century academia. As shown in Table 1, ICT students generally agreed with the integration of technology in their classes (x = 4.13). This reflects their highest positive responses to indicators, including teachers' use of technology to develop thinking skills, with a mean of 4.26. The lowest mean of 3.91 (Integrated) indicated that students perceived the ICT teacher as presenting various technologies, such as simulations, videos, and online resources, in their teaching. It also shows that the utilization of online platforms for learning and practicing new skills and technology is effective as a means to enhance engagement and motivation. Furthermore, the students agree that the use of technology in the ICT class is essential for preparing them for the digital world and acknowledge the teacher's presentation of various technologies, including simulations, videos, and online resources.

Table 2. *ICT students' perception on the interactive instruction of contemporary teaching*

	Indicators	*Mean*	*Interpretation*
1.	Because of the stimulating teaching materials (textbooks, internet resources, etc.) used by the ICT teacher, the learners remain passionate about the subject matter.	3.95	Integrated
2.	The ICT teacher includes instructional materials that give examples and applications of the principles being taught in real-world settings.	3.95	Integrated
3.	The instruction employed in the ICT class encourages interaction and collaboration.	4.06	Integrated
4.	The teaching resources used in the ICT lesson are designed to accommodate a variety of learning preferences and types of learners.	3.96	Integrated
5.	The ICT teacher incorporates strategies, such as group discussions and peer learning activities.	4.03	Integrated
		3.99	Integrated

Legend: 4.50 – 5.00 Highly integrated; 3.50 – 4.49 Integrated; 2.50 – 3.49 Moderately integrated; 1.50 – 2.49 Low integrated; 1.00- 1.49 Not integrated

Table 2 shows ICT students' perceptions of interactive instruction. As shown in Table 2, ICT students displayed an Agree stance towards interactive instruction (x = 3.99). With the highest mean of 4.06 (Integrated), the respondents generally agreed that the instruction employed in the ICT class encouraged interaction and collaboration, and acknowledged the lowest with 3.95 (Integrated) in both perceiving that teaching or instructional materials are essential for the students to be passionate about the subject matter and give examples and applications of principles being taught in real-world settings.

As Senthamarai, S. (2018) considered that interactive teaching characterizes the offering of various learning styles, the ICT students' respondents also agree that the stimulating teaching materials used by their teacher contributed to their remaining passionate about the subject matter. They strongly agree that the teacher includes materials that provide examples and applications beneficial in the real world, or that the resources were designed to accommodate a variety of learning preferences and types of learners.

Table 3. *ICT students' perception on the student-centered learning of contemporary teaching*

	Indicators	*Mean*	*Interpretation*
1.	The ICT teacher empowers the learners to be self-driven and take charge of own learning.	3.69	Integrated
2.	The ICT teacher provides the learners an opportunity to work independently and collaboratively on projects.	4.00	Integrated
3.	The ICT teacher encourages the learners to ask questions, share ideas, and participate actively in class discussions.	4.13	Integrated
4.	The ICT teacher allows the learners to become part in the planning and decision-making process for activities/projects.	4.10	Integrated
5.	The ICT teacher fosters student autonomy, responsibility, and self-directed learning.	4.13	Integrated
		4.01	Integrated

Legend: 4.50 – 5.00 Highly integrated; 3.50 – 4.49 Integrated; 2.50 – 3.49 Moderately integrated; 1.50 – 2.49 Low integrated; 1.00- 1.49 Not integrated

Table 3 represents ICT students' assessment of student-centered learning in contemporary teaching. The overall mean of 4.01 indicates

that ICT students generally agree with the student-centered learning approaches in contemporary teaching methodologies. Despite recognizing that their teachers frequently encourage questioning, idea sharing, and active participation in class discussions, as well as foster student autonomy, responsibility, and self-directed learning with highest mean of 4.13 (Integrated), the findings reveal a comparatively lower mean of 3.69 (Integrated) when describing the extent to which teachers explicitly teach them to be self-driven and take charge of their own learning. This perspective aligns with their agreement that teachers provide opportunities for both independent and collaborative tasks, encourage inquiry, sharing, and participation, and ensure their inclusion in the learning process, a finding supported by the study of Utami and Fatriana (2020).

Table 4. *Summarization on the ICT students' perception on the technological integration, interactive instruction, and student-centered learning of contemporary teaching*

Indicators	*Mean*	*Interpretation*
Technological integration	3.69	Integrated
Interactive Instruction	4.00	Integrated
Student-centered Learning	4.13	Integrated

Legend: 4.50 – 5.00 Highly integrated; 3.50 – 4.49 Integrated; 2.50 – 3.49 Moderately integrated; 1.50 – 2.49 Low integrated; 1.00- 1.49 Not integrated

Table 4 presents the overall results of the ICT students' perceptions on technological integration, interactive instruction, and student-centered learning in contemporary teaching. The findings reveal a consistent result in the students' perceptions across the variables, with mean scores ranging from 3.50 to 4.49, presenting a general agreement (Integrated) with the contemporary teaching approaches. This narrow range suggests a relatively uniform and positive view of how technology is integrated, how interaction is facilitated, and how student-centered learning is enacted in their ICT classes.

Table 5. *ICT students' level of confidence in their technical digital literacy skills*

	Indicators	*Mean*	*Interpretation*
1.	Using of basic coding languages and skills (e.g., HTML, CSS, JavaScript).	3.55	Predominantly Confident
2.	Using online communication tools (e.g., email, video conferencing, instant messaging)	3.79	Predominantly Confident
3.	Using word processing software (e.g., Microsoft Word, Google Docs) for creating documents and write-ups.	3.63	Predominantly Confident
4.	Using spreadsheets (e.g., Microsoft Excel, Google Sheets) for data entry and calculations	3.74	Predominantly Confident
5.	Using presentation software (e.g., Microsoft PowerPoint, Google Slides) to deliver presentations.	3.81	Predominantly Confident
		3.70	Predominantly Confident

Legend: 4.50 – 5.00 Very Confident; 3.50 – 4.49 Predominantly Confident; 2.50 – 3.49 Fairly Confident; 1.50 – 2.49 Slightly Confident; 1.00- 1.49 Not Confident

Table 5 presents ICT students' perception of their technical digital literacy skills. As indicated in Table 4, ICT students expressed predominantly confident perceptions with an overall mean of 3.70 regarding their abilities in this domain, signifying a generally positive self-assessment of their technical skills. Specifically, they reported their highest confidence in utilizing presentation software for delivering presentations. In this digital era, familiarity and proficiency in Microsoft Office Suite and Google Workspace tools and applications, such as Microsoft Word, Google Docs, Microsoft Excel, Google Sheets, email, and video conferencing, are expected for completing academic tasks and outputs. Conversely, their lowest confidence level of 3.55 (Predominantly Confident) in using basic coding languages suggests that the course topic is technically challenging. To address this, it is recommended that more hands-on activities be integrated to provide ample opportunities for practical coding practice.

Table 6. *ICT students' level of confidence in their cognitive digital literacy skills*

	Indicators	*Mean*	*Interpretation*
1.	Searching effectively for and retrieving information from online resources.	3.94	Predominantly Confident
2.	Avoiding and identifying online scams and phishing attempts.	4.06	Predominantly Confident
3.	Comparing data and information from multiple online resources to create own conclusions in writing research paper.	3.83	Predominantly Confident
4.	Use of online tools to enhance the academic writing skills.	3.86	Predominantly Confident
5.	Use of online learning platforms for additional learning and references.	3.96	Predominantly Confident
		3.93	Predominantly Confident

Legend: 4.50 – 5.00 Very Confident; 3.50 – 4.49 Predominantly Confident; 2.50 – 3.49 Fairly Confident; 1.50 – 2.49 Slightly Confident; 1.00- 1.49 Not Confident

Table 6 highlights ICT students' perceptions of the cognitive skills associated with digital literacy. As highlighted in Table 5, ICT students are predominantly confident in perceiving these skills in their ICT class (x = 3.93). Respondents showed their highest level of confidence, with a score of 4.06 (Predominantly Confident), in identifying and avoiding online scams and phishing attempts. This is supported by the findings of Khader et al. (2021), which mention that the high confidence of students in accessing technology and online safety is influenced by increased awareness of online privacy and security issues, which their teachers utilize as illustrative examples in their instruction.

Table 7. *ICT students' level of confidence in their ethical digital literacy skills*

	Indicators	*Mean*	*Interpretation*
1.	Understanding of safe online behavior and how to defend against online threats.	4.06	Predominantly Confident
2.	Capacity to be clear and identify plagiarism when using online sources.	3.88	Predominantly Confident
3.	Awareness and control of privacy and security while searching for online resources.	3.83	Predominantly Confident
4.	.Assessing strictly the online content for possible biases, misinformation, or disinformation.	3.68	Predominantly Confident
5.	Awareness of the risks and ethical considerations in sharing personal information online.	4.05	Predominantly Confident
		3.90	Predominantly Confident

Legend: 4.50 – 5.00 Very Confident; 3.50 – 4.49 Predominantly Confident; 2.50 – 3.49 Fairly Confident; 1.50 – 2.49 Slightly Confident; 1.00- 1.49 Not Confident

Table 7 indicates ICT students' perception of digital literacy ethical skills, with a mean of 3.90 (Predominantly Confident). As reflected in Table 6, ICT students are predominantly confident, with a mean of 4.06 in their understanding of safe online behavior and how to defend against online threats. However, despite this high level of confidence in safe online practices, their lowest mean confidence, 3.68 (Predominantly Confident), was reported in critically assessing online content for potential biases, misinformation, or propaganda.

The respondents also expressed predominantly confidence on their capacity to be clear and identify plagiarism when using online sources, their awareness and control of privacy and security while searching for online resources, and the awareness of the potential risks and ethical considerations associated with sharing personal information online.

Table 8. *Summarization on ICT students' level of confidence in their technical, cognitive, and ethical skills of digital literacy*

Indicators	*Mean*	*Interpretation*
Technical Skills	3.70	Integrated
Cognitive Skills	3.93	Integrated
Ethical Skills	3.90	Integrated

Legend: 4.50 – 5.00 Very Confident; 3.50 – 4.49 Predominantly Confident; 2.50 – 3.49 Fairly Confident; 1.50 – 2.49 Slightly Confident; 1.00- 1.49 Not Confident

Table 8 exhibits the overall results of the ICT students' self-assessed confidence in the technical, cognitive, and ethical dimensions of their digital literacy. The findings reveal a consistent trend in their responses, with all mean scores ranging between 3.50 and 4.49, signifying a "Predominantly Confident" stance. This suggests that, as a whole, the ICT students perceive their abilities across these core digital literacy skills with a similar and relatively positive degree of confidence.

Table 9. *Summarization on ICT students' level of confidence in their technical, cognitive, and ethical skills of digital literacy*

Range	*Technical Skills*		*Cognitive Skills*		*Description*
Scale	*Frequency*	*Percentage*	*Frequency*	*Percentage*	
90-100	53	66.25	42	52.5	Outstanding
80-89	16	20	16	20	Very good
70-79	11	13.75	22	27.5	Good
60-69	0	0	0	0	Fair
Below 60	0	0	0	0	Need improvement

Table 9 presents the ICT students' performance in technical and cognitive skills, serving as an assessment of their digital literacy. The table displays the frequency and percentage distribution of student performance across both skill domains. Among the 80 respondents, the percentages for both technical and cognitive skills ranged from 70% to 100%. On the technical skills aspect, the frequency distribution revealed that 53 students (66.3%) achieved scores with the highest performance range, indicating competency in areas such as web browsing, keyboard control keys, office productivity software, antivirus software, online security practices, and cloud storage. Moreover, 16 students (20%) attained scores in a higher range, while 11 students (13.8%) scored within a mid-range for these skills.

On the other hand, the table also illustrates the distribution of cognitive skills competency, wherein 42 students (52.5%) reached the highest competency range in areas encompassing problem-solving, assessing the credibility of social media videos, utilizing online resources effectively, and synthesizing information from multiple online sources. The remaining students were distributed with 16 (20%) achieving higher ratings, and 22 (27.5%) exhibiting mid-range performance.

Table 10. *The correlational analysis on the ICT students' perception on the integration of contemporary teaching and digital literacy*

Variables	*Technical Skills*	*Cognitive Skills*	*Ethical Skills*
Technological Integration	0.091	0.465**	0.434**
Interactive Instruction	0.193	0.451**	0.505**
Student-Centered Learning	0.255*	0.419**	0.455**

Legend: xy significant at < .01 level

Table 10 presents the correlational analysis examining the relationship between ICT students' perception of the integration of contemporary teaching and digital literacy. The results revealed that the perception of technological integration, interactive instruction, and student-centered learning has a strong and positive association with students' cognitive and ethical skills of digital literacy compared to their technical skills. Specifically, students who perceive their learning as more student-centered, interactive, and technologically integrated exhibit higher confidence in their abilities related to utilizing online tools for academic writing, effectively searching for online resources, determining online scams, understanding safe online behavior, and assessing online content.

On the other hand, between the perception of technological integration, interactive instruction, and student-centered learning, and the technical skills of basic coding and using Microsoft Office software, there was no statistical significance. This suggests that while students may be confident in the perceived contemporary teaching approaches, there is a stronger impact on their cognitive and ethical digital abilities than on their foundational technical skills.

The findings exhibited two distinct constructs measured within the study. The contemporary teaching section of the research instrument focused on obtaining student perceptions. In contrast, the digital literacy technical skills section assessed student performance. While students provided assessments of their ICT teacher concerning their contemporary teaching approaches, their own digital literacy performance was assessed in the latter section.

Therefore, the distinction shows the educational landscape by presenting both subjective experiences and objective outcomes. While the student perceptions of contemporary teaching comprehend the impact of instructional delivery from their viewpoint, the assessment of technical skills provides information on the mastery of digital capability. These factors may not directly indicate evident skill acquisition, but rather inform the targeted pedagogical interventions.

Table 11. *The correlational analysis on the ICT students' perception on the integration of contemporary teaching and digital literacy as to the ICT students' technical and cognitive skills*

Variables	*Technical Skills*	*Cognitive Skills*
Student-Centered Learning	0.013	0.102
Interactive Instruction	0.005	0.068
Technological Integration	-0.032	0.026

Legend: x significance level of .05; xy significant at < .01 level

Table 11 presents the correlational analysis examining the relationship between ICT students' perception on the integration of contemporary teaching and digital literacy, specifically in terms of its technical and cognitive aspects. Based on the results presented in the table, it is unlikely that any of the observed correlations reached statistical significance at the 0.05 level of significance. Therefore, the findings suggest that the perception of contemporary teaching and digital literacy is not significantly related, as measured by the technical and cognitive components. For instance, a student might appreciate the use of technology without necessarily feeling that it enhances their coding skills or their ability to assess online content. Moreover, although interactive instruction aims for collaboration, the technical skills findings might not be strongly perceived by the students.

The study's primary objective is to investigate the impact of integrating contemporary teaching and digital literacy on Grade 12 ICT students. The study aims to determine the perception and performance of respondents regarding the integration of contemporary teaching, focusing on technological integration, interactive instruction, and student-centered learning, as well as digital literacy skills, specifically technical, cognitive, and ethical skills. Thus, this analysis employed a descriptive-correlational approach to investigate and discuss the role of contemporary teaching approaches in the development of digital literacy among ICT strand students. The study also provided valuable insights into the driving factors of learning outcomes in this digital era.

Conclusion

Based on the study's findings, the correlational analysis of ICT students' perception of contemporary teaching and digital literacy in relation to their technical and cognitive skills revealed no statistically significant correlations at the 0.05 level of significance. Therefore, the hypothesis stating that the respondents' perception of contemporary teaching and digital literacy is partially not sustained. On the other hand, the study's findings on the correlational analysis of integrating contemporary teaching and digital literacy in relation to ICT students' technical and cognitive skills revealed that none of the examined correlations reached statistical significance at the 0.05 level of significance. Therefore, the hypothesis stating that the integration of contemporary teaching is not significantly related to the respondents' technical and cognitive skills is sustained.

The study recommends the following based on its findings and conclusions:

Addressing the neutral perception of interactive instruction, ICT teachers should explore and implement diverse and engaging interactive strategies that promote active learning and the application of technical and cognitive digital literacy skills, essential for navigating the 21st-century digital landscape.

School administrators may provide regular professional development opportunities for teachers to develop an updated ICT-innovative approach in the teaching and learning process, such as seminars and training workshops.

ICT teachers may increase the use of collaborative activities and hands-on tasks that inherently require students to integrate technology and utilize their digital literacy skills to solve problems, create solutions, and learn from one another in a student-driven environment.

To ensure that contemporary teaching approaches align with student preferences and learning needs in the evolving ICT landscape, ICT teachers should continuously monitor student perceptions to tailor their teaching to maximize student engagement and learning outcomes.

Recognizing the demands of the 21st century, educational institutions should actively promote and facilitate the utilization of technology by all teachers, irrespective of their subject matter, to enhance instructional delivery.

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