

Learning Styles and Digital Competence of Senior High School Student in Filipino Subject

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Abstract

The emergence of new and growing technology has led to evolving student demands, which are poised to revolutionize the education sector. In the modern age of digital technology, being digitally literate is not just a skill but also a requirement for succeeding in school. Additionally, data suggests that pupils' digital literacy depends on their preferred learning style. This study is essential to determining local senior high school pupils' digital competency and learning styles. This quantitative study used a descriptive-correlational research design with 150 senior high school students who are currently enrolled in Matanao National High School for the 2023–2024 academic year, chosen at random. Two sets of standardized survey questionnaires were used to evaluate senior high school pupils' digital competency and learning styles. According to a study, seniors in high school display a significant affinity for different learning styles while also having a high degree of digital competency. The auditory learning style does not seem to have a significant role, especially in advanced digital tool usage, even though there is a significant association between learning style preferences and numerous areas of digital competence, particularly in using digital tools and managing platforms. In order to improve students' digital competency, the researcher advises educational institutions to implement a variety of teaching methodologies that meet the needs of visual and collaborative learners. When creating digital tools and platforms, technology developers and suppliers should take senior high school students' varied learning preferences into account. Legislators should also prioritize digital literacy programs when creating curricular frameworks and educational regulations so that all students, regardless of learning preferences, acquire fundamental digital skills. More studies are required to understand further the connection between digital competency and learning styles in various age groups and educational situations.

Keywords: learning style; digital competence, Filipino, descriptive, quantitative

I. INTRODUCTION

The education landscape is poised for transformation due to evolving student demands influenced by the advent of novel and developing technologies. Education has traditionally taken place within the confines of schools, with teachers assuming the primary role in facilitating digital learning activities. Nevertheless, in light of the pandemic, students and teachers need digital competence to facilitate their educational endeavours. Students who have these skills must be given assistance and guidance in navigating the educational landscape of the digital era. In addition, with today's reality that standardized tests are primarily administered through online platforms, learners must further realize their ability to improve in the face of potential technological disadvantages. In the contemporary world, where digital technology is a promise, possessing digital literacy is more than just a skill; it is also a significant factor in achieving success in education.

Moreover, it is also noteworthy that evidence has revealed that learners' digital proficiency has something to do with their learning styles. For instance, learners at Anadolu University in Turkey have a foundational level of digital competency, which makes them dependent on further instruction in optimizing digital resources for educational purposes (Ozdamar-Keskin et al., 2015). In Bosnia and Herzegovina, students display a pronounced inclination for technology-enhanced learning, and they prefer video as a medium for teaching the learning process (Huseinović, 2022). In the context of the Universidad Autónoma de Querétaro, it has been said that learning style is a facilitator for improving digital competencies (Palomé-Vega et al., 2020). Thus, it is crucial to stress that a comprehensive plan be devised to measure digital competencies and learning styles within the academe to foster digital technology's efficient and effective utilization.

In the national lens, the flourishing of the academic performance of Filipino students is significantly influenced by visual and audiovisual learning styles in the context of national digital literacy skills, as opposed to other learning preferences (Magulod, 2019). Students in 13 educational institutions in the Bicol Region display initial levels of digital competency (Fajardo, 2023). Concerning this matter, educators within the Dasmariñas, Silang, and Cavite School Divisions in the province of Cavite demonstrated a commendable level of digital literacy proficiency (Vidal et al., 2022). However, they need to enhance their utilization of advanced digital classroom tools. It was observed that their interest in employing these tools, which is crucial for fostering students' digital competence, could have been higher.

According to a study conducted in Davao del Norte, as technology becomes more interwoven into daily life, educators must adopt a new perspective on the use of technology in accordance with learning styles (Paja et al., 2020). Locally, the impact of digital competence on a student's learning methods is noticeable, but local studies have yet to study this subject. Digital literacy abilities have become prominent in the current dynamic educational environment. For years, the educational system has been trapped in time. While some advances have been made, there is still a long way to go until educational programs and institutions' ways of teaching and learning are appropriately suited to the new digital age and student profiles.

With these technological foundations in mind, we are transitioning from a brick-and-mortar learning environment to a virtual one (Sousa et al., 2022). This phenomenon leads to the emergence of diverse and advanced learning styles among students (Aguilar et al., 2022). Recognizing and supporting learning styles for all students is becoming a challenge due to the growing diversity in student populations and the rapid technological advancements (Alalwan, 2022). This, therefore, begs several questions. Henceforth, it is imperative to carry out this study to identify the learning styles and digital competence among local senior high school students.

Rationale of the Study

Literacy has redefined itself from only reading and writing to other literacy areas such as media, financial, and mainly digital competency. As a result, students' styles of learning and preferences have also shifted (Sánchez-Caballé et al., 2020). Numerous studies have laid the groundwork for the current inquiry, indicating that these variables significantly influence the learning process. To prevent a digital generation divide in online education, educational institutions and instructors must remain updated on emerging technologies and conscientiously develop digital proficiency (Cabero-Almenara et al., 2022). This enabled them to effectively enhance learning outcomes and foster a collaborative learning community accommodating diverse individual learning preferences. Therefore, the result of this study gives a scholarly perspective to the following stakeholders:

Department of Education. For the DepEd to effectively navigate the constant shift in the virtual

learning landscape, it is crucial for all people involved to learn and embrace the idea of the diversity of learners, especially their learning styles. Thus, it is anticipated that a welcoming atmosphere will be established that fosters mutual support and belongingness. The digital impact on society may have different perspectives among people, and they need to address this challenge and work together to alleviate potential risks and disadvantages of technology in the landscape of education, especially with the virtual platform growing around and as individuals across the board continue to adopt and embrace these technological advancements.

Teachers. In the context of digital learning, teachers must create and adopt a curriculum that could help address student's diversity, especially in their learning styles. Understanding learners, preferred learning styles is essential, as it guides them in tailoring and modifying instructional methods effectively. Having this more profound idea about student learning styles, teachers will eventually make sure to adjust their pedagogical techniques, giving aligned learners' needs and meaningful tasks that will surely cater to different sets of learners at different age groups, more particularly in developing digital competence.

Students. Learners who possess higher digital literacy abilities will have an advantage when using educational platforms. Furthermore, it is worth mentioning that students must develop this skill so that they do not encounter challenges in their academic endeavours due to their incompetence. In the education landscape, understanding learners' preferred learning styles optimizes the learning process. This study will determine how visual, kinesthetic, aural, and oral aptitudes are significant in developing student's digital competence.

Future Researchers. The result of this study further gives empirical insights for future researchers about digital competence and learning styles. The findings functioned as a valuable resource for informing future academic pursuits, providing a solid foundation for further research, and offering methodical guidance within the framework of this well-structured research article. The findings of this study assist researchers in identifying, assessing, modifying, generating, and disseminating relevant literature using diverse sources and technologies to support their future research endeavours about the subject under investigation.

Statement of the Problem

This study was conducted to identify the learning style preferences and digital competence employed by Senior High School students and determine the relationship between these two variables.

Specifically, this research seeks to provide answers to the following questions:

1. What is the level of learning styles utilized by senior high school in terms of:
 - 1.1 Visual Learning Styles;
 - 1.2 Auditory Learning Styles; and
 - 1.3 Collaborative Styles?
2. What is the level of digital competence among Senior High School students in terms of:
 - 2.1 Ability to Use Digital Learning Tools;
 - 2.2 Managing Digital Learning Platforms;
 - 2.3 Ability to Use Advanced-Level Digital Tools and
 - 2.4 Security and Ethics?
3. Is there a statistically significant relationship between learning style preferences and digital competence among Senior High School students?

4. Which among the indicators of learning styles significantly influences the digital competence of senior high school students?

Hypothesis

The hypothesis of this study was tested at a 0.05 level of significance.

HO1. No significant relationship exists between learning style preferences and digital competence among senior high school students.

HO2. None of the indicators of learning styles significantly influence the digital competence of senior high school students.

Review of Related Literature

Several pieces of literature and studies have been published in the area of attitude and capabilities towards research. Information that is relevant to this research endeavour has been provided in this section.

Learning styles

There are many of the best learning styles for all students. Each person has a unique way of learning that works best for them. It is essential to look into different ways of learning and figure out which one works best for each student (Costa et al., 2020). Many people use the term learning styles to talk about how they take in knowledge, sort it, understand it, put it in order, draw conclusions from it, and "store" it for later use (Ariastuti & Wahyudin, 2022). The main idea behind learning styles is the same, even though the categories are different: we all have a preferred way of learning that works best for us, and we learn best when knowledge is presented in this way.

Understanding different learning styles is essential for both academic success and personal growth (Dantas & Cunha, 2020). Everyone has different learning preferences, like learning best by seeing, hearing, touching, or reading and writing. These preferences significantly impact how well people understand and remember things. Teaching methods can be changed to meet the needs of each student better if teachers are aware of and can accommodate these different learning styles. This eventually leads to better learning outcomes (Katsaris & Vidakis, 2021). Teachers can use various teaching methods to make classrooms welcoming to all students and meet their individual needs and preferences. This increases student engagement and overall academic success.

Learning about different learning types is also helpful outside of school in many areas of life, such as personal growth and career success. People who know their preferred learning styles can use that information to improve their learning, whether trying to learn new things, advance in their jobs, or pick up new hobbies (Shamsuddin & Kaur, 2020). People can improve their learning potential and speed up the process of taking in and processing knowledge by using strategies that work with the way they learn best. Ultimately, people and businesses can reach their full potential by recognizing and allowing different learning styles (Cabual, 2021). This led to constant growth and new ideas.

Visual learning styles. Being a visual learner involves cognitive processes that rely on mental imagery rather than linguistic representation. Visual learners excel in their learning process using visual aids such as graphs, tables, charts, maps, colours, and diagrams. In addition, they tend to acquire knowledge holistically rather than sequentially or fragmentedly (Salam & Arifin, 2020). An advantage of being a visual learner is the ability to perceive the whole perspective readily. Visual learning is a method in which pupils use

visual assistance to remember and understand information. Visual learners possess a natural ability to picture objects mentally, exhibit a strong sense of proportion and alignment, have a keen focus on colours, and effortlessly imagine visual representations (Halif et al., 2020).

It is essential to understand and meet the needs of students who learn best by observing things, especially when it comes to being tech-savvy. Photos, movies, infographics, and interactive interfaces are some of the main ways that information is shared visually these days. This gives people who like to learn by seeing things a clear advantage (Wahyudin & Rido, 2020). People who learn best by seeing things are better able to understand and remember what they are taught. This makes it easier for them to understand complicated ideas, use digital tools, and analyze data (Wahyudin & Wahyuni, 2022).

Auditory Learning Styles. Auditory learning refers to the learning style in which a student achieves optimal learning outcomes through listening (Masela & Subekti, 2021). They prefer attending a lecture rather than reading a textbook or receiving verbal directions for a project instead of learning it through practical experience. These individuals possess excellent listening skills and a remarkable ability to retain spoken knowledge (Mašić, Polz, & Bećirović, 2020). Auditory learners excel at acquiring knowledge through the acts of hearing and speaking. Therefore, when introducing novel concepts and ideas, it is more effective to convey information verbally. One can accomplish this by engaging in either group deliberations or individual dialogues.

It is essential to consider the needs of auditory learners when it comes to digital competence (Yotta, 2023). Visual aspects are essential in digital interfaces and content, but auditory learners excel when information is delivered with spoken words, sound effects, and directions. Regarding digital competence, those aural learners find audio-based learning tools, such as podcasts, audiobooks, and instructional films with distinct narration, advantageous (Rini, Adisya Putra, & Sigit, 2020). These aural mediums enable individuals to efficiently assimilate knowledge, enhance comprehension, and interact with digital content in a manner that corresponds to their preferred learning styles.

Collaborative Styles. Collaborative learning encompasses a range of pedagogical approaches that require students or teachers to engage in joint intellectual endeavours. Students typically collaborate in two or more groups to develop a product and seek understanding, solutions, meanings, or both. A collaborative learning system is an application that facilitates the exchange of knowledge and the acquisition of new, pertinent information among team members in a centralized location (Troussas et al., 2023). Typically, these systems are accessible through software or tools, facilitating universal access to identical information irrespective of one's work environment (Konrad, Wiek, & Barth, 2021).

Studies indicate that educational opportunities characterized by active participation, social interaction, real-world relevance, captivating content, and student autonomy result in more profound learning. Collaborative learning has several advantages, such as the cultivation of advanced cognitive abilities, improvement in verbal communication, enhancement of self-control, and the development of leadership aptitude (Sangari & Zerehsaz, 2020). Administrations frequently impose directives on teachers to utilize a specific technological product or application, regardless of its lack of suitability for their students. Proficient educators possess an understanding of how their students actively participate and acquire knowledge, enabling them to leverage this insight to advocate for the implementation of technology that will unleash innovative teaching capabilities (El-Amin, 2020).

Digital competence

In recent years, the concept of digital competence has emerged as a crucial topic in the discourse

surrounding the necessary skills and information individuals should possess in a knowledge-based society. The notion is primarily political, representing opinions and aspirations regarding future requirements. It originates from economic competition, where new technology is seen as both an opportunity and a solution (Zhao, Llorente, & Gómez, 2021). Digital competence refers to the latest idea that encompasses abilities related to technology. In recent years, various terms have been employed to delineate the proficiency and expertise in utilizing digital technologies, including ICT skills, technology skills, information technology skills, 21st-century skills, information literacy, digital literacy, and digital skills (Sánchez-Caballé, Gisbert Cervera, & Esteve-Mon, 2020).

Furthermore, the impact of advancements in technology on society and culture leads to changes in terminology. The content and breadth are anticipated to undergo further modifications (Sillat, Tammets, & Laanpere, 2021). A practical framework facilitates the identification of particular competencies that need to be addressed. It also anticipates learning outcomes and proficiency levels. Additionally, it serves as a tool for creating valid and reliable measurement and assessment instruments to track the improvement of a country's talent pool in terms of digital skills over time (Núñez-Canal, de Obesso, & Pérez-Rivero, 2022). Digital competence is a dynamic notion that pertains to the advancement of digital technology and the political goals and expectations of citizenship in a knowledge-based society.

Digital competence encompasses a diverse range of skills and competencies, and its breadth is extensive, spanning from media studies and computer science to library and literacy studies. By using diverse digital tools and resources that cater to various learning styles, one can develop digital competence by providing accessible and captivating educational materials for all learners (Erstad, Kjällander, & Järvelä, 2021). In this new educational landscape, many students do not have the skills they need to use digital tools in the classroom when they start college or university because of the changes in the way education works. Digital competence has become an essential idea in recent years when people talk about what skills and knowledge people need to succeed in today's information society (Cattaneo, Antonietti, & Rauseo, 2022). (Cattaneo, Antonietti, & Rauseo, 2022).

Ability to use digital learning tools. Digital competence has been looked at from different language, cultural, and academic points of view. In the past few years, many critical foreign contributions have been made to the definition of digital competence. This concept has become a central idea in discussions about the skills and knowledge people need in the digital age (Alenezi, 2020). Technology that is used for teaching and learning has the potential to change the way schools work. Digital learning can let students be in charge of their learning, encourage them to think deeply and help them work together (Aguilera-Hermida, 2020). As a teacher, digital learning and the technology that supports it can help students learn faster, remember what they have learned, and get involved socially and emotionally.

Digital learning makes it easy for people to learn at their own pace and when it is most convenient for them. In addition, digital learning helps people acquire new skills and knowledge that are useful in this digital age. These tools make it possible for users to access vast amounts of information, take part in engaging learning experiences, and learn crucial digital literacy skills (Núñez-Canal, de Obesso, & Pérez-Rivero, 2022). Digitally literate students possess the necessary skills and knowledge to utilize digital content and tools in their educational endeavours effectively. Having digital literacy abilities allows individuals to locate and retrieve digital content that is suitable for a specific purpose (Lestiyawati, 2020). Digital competence empowers users to effectively navigate diverse digital learning platforms, assess the reliability of online content, and differentiate pertinent information from the extensive collection of digital resources.

Managing digital learning platforms. Digital learning offers individuals a convenient and flexible method of acquiring knowledge according to their timetables and pace (Amin & Sundari, 2020). Furthermore,

digital learning facilitates the acquisition of novel proficiencies and abilities that are indispensable in the contemporary digital era. Effectively overseeing digital learning platforms is essential to digital proficiency, specifically within academic establishments, corporate training initiatives, and virtual learning settings. Efficient administration of these platforms necessitates supervision of diverse facets, such as the generation of content, interaction with users, provision of technical assistance, and analysis of data, in order to maximize the educational experience and attain the intended results (Cattaneo, Antonietti, & Rauseo, 2022).

In addition, it is essential to safeguard user engagement and participation in order to achieve success with digital learning initiatives. Users should utilize various tactics to encourage active engagement, including practicing virtual dialogues, integrating gamification components to stimulate learning, and involving virtual gatherings (Al-Mamary, 2022). In addition, through honest feedback and assisting students, a classroom environment conducive to learning is cultivated, increasing their motivation and retention. Furthermore, knowledge of others is required for effective management of digital learning platforms. They are responsible for ensuring the smooth operation of the platform, addressing technical complications, and ensuring security protocols to ensure user information and privacy (Decuypere, Grimaldi, & Laundry, 2021).

Ability to use advanced-level digital tools. Digital literacy is an essential living skill that affects more than just academic success. It also affects social progress and job readiness. Technology is becoming more and more important in kids' and adults' lives, so learning digital literacy skills is becoming more and more essential for them, too (Manco-Chavez et al., 2020). A significant part of figuring out someone's digital competence is how well they can use complex digital tools. Being good at using new digital tools is essential for success in personal, academic, and professional life in a world where technology is changing all the time (Zhao, Llorente, & Gómez, 2021).

Advanced digital tools are also necessary in fields like engineering, data science, and computer programming, where individuals use software and algorithms to look at data, come up with new ideas, and build very complicated systems. If people fully understand these tools, they can draw valuable conclusions from massive datasets, make operations run more smoothly, and come up with cutting-edge solutions that encourage progress and creativity in many areas (Jorge-Vázquez et al., 2021). In conclusion, being able to use complicated digital tools is an integral part of digital competence because it lets people solve complex problems, show their creativity, and use technology to reach their goals. People who decide to learn how to use cutting-edge digital tools can get into new markets, improve their skills, and stay ahead of the competition in a society that is becoming more and more affected by technology (Štaka, Vuković & Vujović, 2022).

Ethics and security. It is essential to keep users safe from harm like identity theft, damage to their image, and financial losses by honestly handling this information. Misusing or illegally sharing personal information can hurt people's trust in a brand, hurt its image, and even get people in trouble with the law. Understanding digital ethics gives students the tools to make intelligent decisions and take necessary steps to protect themselves and their friends from online dangers like identity theft, cyberbullying, and scams (Christen, Gordijn, & Loi, 2020). Understanding and using security means to protect digital assets, data, and systems from cyber threats, intrusions, and people who are not supposed to be there is an essential part of being digitally competent (Zhao, Llorente, & Gómez, 2021).

People who are good with computers should know about the best ways to keep their data safe online. These include encryption, managing passwords, two-factor authentication, and safe viewing. Additionally, they should know about common cyber threats like phishing, social engineering, and malware and take strategic steps to lower risks and protect both personal and business data (Karale, 2021). Also, being good with technology means being honest and safe. People need to be able to handle the problematic world of technology in a good way (Raab, 2020). By promoting a culture of cybersecurity and ethical behaviour and

adding security and ethics into digital literacy programs, people can learn how to use technology in a way that is both up-to-date on ethical standards and lowers risks.

Theoretical Framework

The research centers on Fleming's 1987 VARK Framework. The letters VARK stand for visual, aural, written, and kinesthetic. Fleming's VARK learning style model includes a questionnaire designed to determine an individual's preferred sensory modality during the learning process (Lehman, 2019). This assessment facilitates learning by providing individuals with tailored study recommendations that align with their preferred learning style (Paturusi, 2022). Researchers have discovered that in comparison to standard learning methods, visual and audiovisual learning styles have a more significant impact on students' digital literacy skills (Romprasert, 2023).

The leading theory framework used in this study is also connected to the Digital Competence Framework. This framework's primary goal is to help people become responsible digital citizens who can make positive impacts on the digital world (Vuorikari et al., 2022). The framework also aims to teach students valuable ways to communicate electronically, stress the value of creativity in creating digital content, and emphasize the need for students to be able to handle data and information (Mattar et al., 2022). The proposition posits that the four degrees of competency in digital competence, namely foundation, intermediate, advanced, and highly specialized, exhibit variations among individuals due to their distinct learning preferences (González-Pérez & Ramírez-Montoya, 2022).

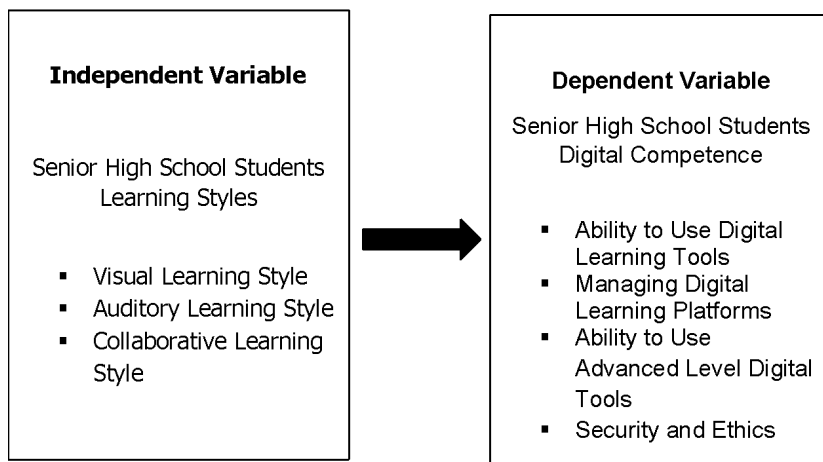


Figure 1. Schematic Diagram of the Variables of the Study

Figure 1 depicts the independent and dependent variables of the research investigation. The independent variable in this study was the learning styles of senior high school students, which were measured using three indicators: personal learning preferences, problem-solving preferences, and project work preferences. The dependent variable, which is the senior high school student's digital competence, is as follows: ability to use digital learning tools, managing digital learning platforms, ability to use advanced-level digital tools, and security and ethics.

II. METHOD

This section outlines the research methodology and process utilized in this investigation, encompassing the research design, research site, research participants, research instruments, data collection process, and data analysis.

Research Design

The researchers followed a descriptive-correlational research approach to better understand the objectives of this quantitative investigation. Under this method, the two main variables are described and the degree of correlation between them is investigated without the researcher controlling either variable (Seeram, 2019). The purpose of this study was to find out which learning style senior high school students favored and whether these learning styles affect their digital competence. Finding if these factors are positively or negatively correlated is the goal (Bloomfield & Fisher, 2019). Thus, the descriptive and objective documentation of the research results as well as the thorough examination and interpretation of the interrelationships that occurred between the two main variables make this specific design suitable for use (Siedlecki, 2020).

Research Locale

The study took place in the province of Davao del Sur, inside the boundaries of Digos City. Coastal in the province of Davao del Sur, Digos is a component city. The province's administrative center is housed there. The target population is senior high school students who are currently enrolled for the 2023–2024 school year. Public schools are the classification given to every educational institution that is part of this study. Moreover, the schools have implemented K–12 basic education curricula that include junior and senior high school levels.

Research Respondents

Senior high school students were selected for this study through a simple random sampling approach. Using random selection, this study chose a portion of people from a bigger group (Bhardwaj, 2019). All members of the population have an exact and equal chance of being chosen in this sampling process (Zaman & Toksoy, 2019). Because it depends only on one random selection and requires little prior knowledge about the population, this strategy is regarded as the most straightforward among the numerous probability sampling procedures (Mahmud, Huang, Salloum, Emara, & Sadatdiynov, 2020). Academic research is thought to benefit most from this specific approach since it can reduce possible biases and produce better results. For the academic year 2023–2024 the researcher selected 150 senior high school students from public secondary schools using a straightforward random selection process. The 100 samples chosen are judged appropriate for statistical analysis of the data gathered to answer the research questions of the study.

Research Instrument

The researcher utilized an adapted survey questionnaire to measure the level of digital competencies and learning styles of senior high school pupils. This is an adapted questionnaire of a 2015 study by Nilgun Ozdamar-Keskin, Fatma Zeynep Ozata, and Kerim Banar titled "Examining digital literacy competencies and learning habits of open and distance learners." The first part of the questionnaire measures the learning style preferences with three different indicators that are as follows; Visual Learning Styles; Auditory Learning Styles; and Collaborative Styles. A 5-point Likert scale was used for the whole the survey. A rating of 1 means "never or almost never," which is the least descriptive answer. A score of five, on the other hand, means "always or almost always," which is the most accurate way to describe it.

RANGE OF MEANS	LEVEL	DESCRIPTION	DESCRIPTIVE MEANING
4.21-5.00	5	Always or Almost Always	The preference for learning styles among senior high school students is very high.
3.41-4.20	4	Usually	The preference for learning styles among senior high school students is high.
2.61-3.40	3	Sometimes	The level of learning style preference among senior high school students is average.
1.81-2.60	2	Rarely	The level of preference for learning style among senior high school students is low.
1.00-1.80	1	Never or Almost Never	The level of preference for learning style among senior high school students is very low.

Furthermore, the second part is to measure the level of digital competence that includes four indicators: understanding of security and ethical issues, administration of digital learning platforms, competency in using advanced-level digital tools, and use of digital learning tools. On the 5-point Likert Scale used in the survey, 1 (Definitely Not) denotes the least descriptive equivalent and interpretation and 5 (Definitely) the maximum. This has been depicted in the table presented below.

RANGE OF MEANS	LEVEL	DESCRIPTION	DESCRIPTIVE MEANING
4.21-5.00	5	Definitely	The level of digital competence among Senior high school students is very high.
3.41-4.20	4	Probably	The level of digital competence among Senior high school students is high.
2.61-3.40	3	Possibly	The level of digital competence among Senior high school students is average.
1.81-2.60	2	Probably Not	The level of digital competence among Senior high school students is low.
1.00-1.80	1	Definitely Not	The level of digital competence among Senior high school students is deficient.

Ethical Considerations

Incorporating ethical considerations in implementing this study is imperative to safeguard the participants from any damage. Hence, the investigator took measures to ensure meticulous adherence and observation of the subsequent indicators for protocol assessment: social value, informed consent/assent, risks, benefits, and safety, information privacy and confidentiality, justice, transparency, researcher qualification, adequacy of facilities, and community involvement.

Social Value. The concept of social value refers to the positive impact or benefit an individual, organization, or activity has on society. The researcher asserts that this study holds significance for local communities and the nation, as it benefits all individuals involved in the academic sphere. Proficient teacher-researchers might carry out further investigations pertaining to enhancing community development. This study aims to provide valuable insights to Department of Education officials and school administrators regarding learning styles and digital competence.

Informed Assent. Researchers ensure an individual's voluntary agreement to participate in a research study after being provided with all relevant information. The participants must possess a comprehensive understanding of their involvement in the research. The participant's parents or guardians and responders received comprehensive details regarding the research's objectives, methodology, and potential outcomes through the informed consent form provided in print. Furthermore, they retain the prerogative to discontinue their involvement in the study at any point, irrespective of the rationale behind their decision.

Risks, Benefits, and Safety. The study was conducted face-to-face. In-person contacts facilitate improved rapport-building and communication between participants and researchers, which may result in more comprehensive data gathering. Proper wearing of face masks and physical distancing protocols were maintained at all times during the duration of the research premises. The threat of immediate contact and possible infectious disease transmission is reduced when physical distance is maintained.

Privacy and Confidentiality of Information. The researcher adhered to the provisions outlined in the Data Privacy Act of 2012, ensuring the safeguarding of respondents' identities by maintaining anonymity for their names and preserving the confidentiality of their information. The participants have the option to decide whether or not they wish to provide information, including sensitive data. The collected data will be utilized solely for this research and will not be disclosed to other parties.

Justice. Justice is a fundamental principle in various disciplines, including law and philosophy. The researcher intends to employ a basic random sampling technique to select the participants for this investigation. The participants for this study were selected under the specified inclusion criteria, which require that they be senior high school students attending a secondary public school. Furthermore, selecting respondents was influenced by criteria such as ethnicity, socioeconomic background, or any other variables that could compromise the study's integrity and objectivity.

Transparency. The researcher did not disclose any potential conflicts of interest that may develop and take appropriate measures to address them to mitigate bias. The researcher intends to engage in dialogue with the respondent, who has expressed concern, in order to address and find a resolution to the dispute at hand. The researcher employed the random sample procedure to select a substitute respondent if deemed essential.

Qualification of Researcher. The researcher is currently enrolled in English—310 Academic Writing for research and publication. Having a research adviser provides the researcher with invaluable guidance, mentorship, research experience, and networking opportunities, all of which contribute to a successful graduate school application and a strong foundation for future academic or professional career.

Adequacy of Facilities. Hands-on activities pertaining to digital competency and learning styles were held in conventional classroom settings or in specialist training facilities furnished with the equipment that's required, including desks, seats, whiteboards, projectors, and internet access that is available in the researcher's target locale. Assessments of digital proficiency and learning styles may need access to specialized research spaces, including focus group discussion rooms, interview rooms, observation rooms, or usability testing labs.

Community Involvement. Considering the dominant learning styles in a community helps teachers to adapt their teaching methods better to suit the needs and preferences of the pupils. The research can address the many learning styles and degrees of digital proficiency in the community, therefore promoting inclusivity and empowerment. Better educational experiences can follow from this, and eventually, learning results may rise.

Data Gathering Procedure

The investigation was carried out methodically and in order. The researcher methodically carried out a number of procedures and processes in order to get the required information.

Research Ethics Committee approval. First, the School Division Superintendent (SDS) and the relevant school principal must provide their approval before the Dean of the Graduate School at Holy Cross of Davao College can endorse the application. The researcher guaranteed that the research has completed a rigorous review process and has received approval from the Research Ethics Committee. Once the Research Ethics Committee had reached a decision and provided their consent for data collection, the distribution of survey questionnaires was carried out among the participants.

Validation and Administration of the Instrument. After obtaining the necessary consent to proceed with the study, the survey questionnaires must undergo a process of revalidation, which involves the assistance of a single expert, before being distributed. The form provided has detailed instructions on how to respond to the questions accurately.

Request for Ethical Approval to Conduct the Study. In order to undertake a study, it was necessary to obtain an endorsement letter from the Dean of the Graduate School of Holy Cross of Davao College, with the adviser's agreement. Subsequently, accompanied by an endorsement letter from the Dean, the researcher submitted a formal request letter to the Office of the Schools Division Superintendent of Digos City, seeking clearance to conduct the study within several secondary schools in the area. Subsequently, the researcher sought approval from the school principals in the schools mentioned above through a formal letter.

Obtaining Informed Consent and Assent in Research Administration. Upon obtaining the necessary authorization from the School's Division Superintendent and the school administration, the researcher collaborated with the senior high school class advisers to facilitate the distribution of informed consent forms to the parents. This step is crucial as the respondents are under 18 and need more legal capacity to make independent decisions. The process of obtaining informed permission was conducted during a face-to-face meeting of the Homeroom Parent-Teacher Association at the school, specifically with the parents or guardians of the participants. The researcher comprehensively discussed the proper response method for the

provided questionnaires with the learners and their teachers.

Collation and Organization of Data. After successfully administering and retrieving the survey questionnaires, the survey findings were collected, tabulated, evaluated, and subjected to statistical analysis. After the data has been collected and organized, it is necessary to speak with a research statistician to compute and allocate it appropriately. Upon the presentation of the data, the subsequent steps involve the interpretation and analysis of the data outcomes. This entails offering commentary on the findings derived from the inquiry.

Data Analysis

The researcher employed several statistical approaches to provide mathematical representations of the data collected from the participants.

Mean. This was utilized to address the issues presented in problem statements 1 and 2. This study aimed to assess and provide a rationale for the degree of learning style preference and digital competency among senior high school students.

Pearson r. Using this instrument, the current study seeks to ascertain the statistical significance of the relationship between the chosen learning style and digital competency among the chosen participants.

Linear Regression. This study used linear regression to get its results since it sought to find out how different learning style markers affected senior high school students' digital proficiency.

III. RESULTS AND DISCUSSIONS

The findings of the statistical study are presented in this part. The conclusion is presented, followed by a thorough discussion of the significance and implications of numerical data.

Learning Styles of Senior High School Students

Table 1. Learning Styles of Senior High School Students included in the study.

Indicators	Mean	SD
Visual	3.54	0.56
Auditory	3.59	0.67
Collaborative	3.58	0.58

In Table 1, the learning styles of senior high school learners are detailed. The information given reveals a complete biographical outline of the senior high school students who took part in the study. This is especially important for knowing learners' backgrounds because each one is different. In general, the results show that high school seniors like an excellent way to learn. From this study, we can see that high school seniors have a strong preference for specific ways to learn. For these students, this means that they have certain habits or traits that affect how they learn and remember things.

It has been seen that many high school seniors have a favourite way to learn. This means that teachers and people who make lessons should think about how to change their materials and lessons to fit these tastes. Additionally, students who clearly learn best by seeing may benefit from including movies, diagrams, and other similar tools in their lessons. This might help them learn better and be more interested

(Dantas & Cunha, 2020). Making it possible for students who learn best by hearing to talk to each other and use audio-based tools could also help those students. Teachers need to know which learning styles senior high school students like best if they want to make the classroom a better place to learn for everyone (Katsaris & Vidakis, 2021). Because students can use the learning methods that work best for them, they can do their best in these kinds of settings. This shows how important it is to understand and accommodate various learning styles in order to help students do well and achieve their goals (Shamsuddin & Kaur, 2020).

Visual Learning Style. Based on the information given, senior high school students have a visual learning style score of 3.54, which, along with a standard deviation of 0.56, means they are pretty good at or aware of visual learning. This finding shows that, on average, high school seniors remember things better when they are shown to them visually, like in diagrams, videos, pictures, and other visual aids. People who have this skill are more likely to understand and remember things that are shown to them visually.

The result only implies that it is significant to understand how crucial visual learning is as a preference for students. If the students are visual, they think in pictures instead of words. Graphs, tables, charts, maps, colours, and pictures are the best ways for visual learners to learn. They also learn best when they look at things as a whole rather than in stages or pieces (Salam & Arifin, 2020). It is essential to find and support the visual learning style in order to make learning spaces that work for all students and meet their needs and desires (Wahyudin & Rido, 2020). It is possible that using visual learning methods in the classroom will get students more involved, help them understand, and help them do better in school and at work (Wahyudin & Wahyuni, 2022).

Auditory Learning Style. As for auditory learning style, it has an average score of 3.59 with a standard deviation of 0.67, which shows that senior high school students are very good at conversational learning styles. The results of this study show that high school seniors learn better when they hear things like lectures, recordings, spoken directions, and audio-based tools. People in this group understand and remember what you say to them very well. For many high school seniors, hearing things is the best way to learn them. It is essential to be aware of and adapt to a lot of different learning styles so that learning places are helpful and friendly for everyone.

According to Masela and Subekti (2021), the result supports the idea that teachers and instructional designers should think about using auditory learning strategies in their lessons to meet better the needs of senior high school students who strongly prefer to learn this way. This could mean using lectures, audio recordings, spoken directions, and other auditory materials in class to help hearing learners understand and remember what they are learning (Mašić, Polz, & Bećirović, 2020). Also, debates, group events, and conversations can help people who learn best by hearing more. Yotta (2023) says that teachers can get students more interested in learning, help them understand, and help them do better in school by using audio learning techniques along with traditional methods.

Collaborative Learning Style. The standard deviation for senior high schools that use collaborative learning is 0.58, and the average grade is 3.58. Still, this shows that senior high school students have clear preferences when it comes to learning styles. This finding shows that high school seniors do well in school by emphasizing working together to solve problems, communicating clearly, and working together. Additionally, they have a strong tendency to work together on projects with their peers, where they share ideas, have conversations, and work together to reach common goals.

In addition, the fact that senior high school students are very interested in working together to learn suggests that instructional designers and teachers should think about adding collaborative learning strategies to their lessons in order to meet the needs of this group (Konrad, Wiek, & Barth, 2021). According to Sangari

and Zerehsaz (2020), setting up a collaborative learning space could include collaborative initiatives, collaborative instructional exercises, and tasks where students come together to uncover solutions. If high school seniors get the chance to work on their speech, teamwork, and social skills, El-Amin (2020) says they will be better prepared for college.

Young kids in their last year of high school like to learn in many ways. High school students have vastly distinct preferences when it comes to how they like to learn. Some like to see, hear, touch, or work with others. People who work in digital classrooms need to know about and be able to accommodate different ways of learning (Costa et al., 2020). Students can experience many ways to learn through digital competency projects. This helps them build skills that are useful in a wide range of situations.

In conclusion, the different ways that high school students learn show how important it is for programs that teach digital skills to understand and accommodate these variations (Ariastuti & Wahyudin, 2022). By understanding the different ways people learn, teachers may be able to make digital learning settings that are stronger, more effective, more interesting, and more open to everyone (Cabual, 2021). Finally, this will help students become more tech-savvy and give them the skills they need to do well in a world that is becoming more and more digital.

Digital Competence of Senior High School Students

Table 2. Digital Competence of Senior High School Students

Indicators	Mean	SD
Ability to use digital Learning Tools	3.66	0.69
Managing digital Learning Platforms	3.59	0.67
Ability to use advance level of digital tools	3.46	0.72
Security and Ethics	3.74	0.73
Overall	3.61	0.70

The digital competency of senior high school learners appears in Table 2. A score of 3.61 and a standard deviation of 0.70 are shown in the outcome. Senior high school learners generally indicate a high degree of digital competency. They know how to use standard software programs, navigate digital devices, access online information, and communicate successfully in digital settings. Although most senior high school students demonstrate a high degree of digital proficiency, the standard deviation of 0.70 indicates some variation in competence levels across individuals within the group. Scores may vary around the average because some students may exhibit higher levels of digital proficiency while others may show lower levels of competence.

Given the variation in digital competency levels across senior high school pupils, this only suggests a need for individualized support and initiatives (Sánchez-Caballé, Gisbert Cervera, & Esteve-Mon, 2020). Teachers and educational facilities might have to give students who need more help to enhance their digital abilities and more resources, training, or support to close any deficiencies in competence. Even if senior high school students have a high average level of digital competency, there is always space for growth and continued skill development (Zhao, Llorente, & Gómez, 2021).

Students need to keep improving their digital abilities because digital technologies are developing so quickly that they can keep up with the needs of society, the workforce, and education (Cattaneo, Antonietti, & Rauseo, 2022). Senior high school students must possess a high degree of digital competency to be

well-prepared for success in postsecondary education, the workforce, and daily life in the digital age (Núñez-Canal, de Obesso, & Pérez-Rivero, 2022). The substantial amount of digital ability among senior high school students and the wide range of competency levels highlight the significance of ongoing support, skill development, and digital literacy initiatives to ensure that all students have the digital skills they need for success in the digital age (Erstad, Kjällander, & Järvelä, 2021).

Ability to use digital learning tools. The senior high school students' capacity to use digital learning tools is 3.66, with a deviation from the mean of 0.69, indicating a high degree of digital competence under the ability to use digital learning tools. In essence, this means that most senior high school students know how to use digital learning tools effectively. Scores around this average are spread out or varied, as shown by the standard deviation.

The fact that senior high school students are good at using digital learning tools shows that schools have done an excellent job of using technology in the classroom (Lestiyanawati, 2020). Students find it easy to use digital platforms and tools in their lesson plans and teaching methods because they are used to them (Aguilera-Hermida, 2020). Senior high school students are very good at using digital learning tools. This shows how important it is to use technology in the classroom and how important digital literacy programs are for getting students ready for future academic and professional goals in a world that depends more and more on technology (Alenezi, 2020).

Senior high school students are very good with technology because they scored 3.59 on a scale of 1 to 10 for their ability to handle digital learning platforms. This means they know how to use digital materials, collaborative tools, and online learning management systems to help them with their schoolwork. The low standard deviation of 0.67 shows that there is not a slight variation in how well senior high school students can use digital learning tools.

Students in their senior year of high school are very good at using digital learning tools, which means they know how to use technology to improve their education (Al-Mamary, 2022). Senior high school students who know how to use digital learning platforms have more power over their education (Cattaneo, Antonietti, & Rausero, 2022). Senior high school students are very good at using digital learning platforms. This shows how valuable it is to use technology in the classroom and how important digital literacy programs are for getting students ready for a future where they will be dependent on technology (Amin & Sundari, 2020).

Ability to use advanced-level digital tools. There is a standard deviation of 0.72, which shows that high school students are at level 3.46 when it comes to using innovative digital tools. With a total score of 3.46, high school seniors are very good at using advanced digital tools. For tough jobs and projects, this means they know how to use complicated computer languages, video editing software, or other cutting-edge tech.

By the time they are seniors in high school, students who know how to use modern technology better can think more deeply, come up with new ideas, and solve issues. Manco-Chavez et al. (2020) say that they can learn about and use cutting-edge technology to come up with new ideas, creative projects, and digital objects that show how skilled and resourceful they are. Many high school students learn better how to use and understand technology when they use more advanced digital tools (Jorge-Vázquez et al., 2021). They understand technology better and can use it in new ways. This helps them adjust to new digital trends and technologies that are still being created (Štaka, Vuković, & Vujović, 2022).

Ethics and security. This group of senior high school students really knows how important it is to have good computer skills, as shown by their average score of 3.74 and their standard deviation of 0.73. In

general, this means that high school students know and understand how important it is to be safe and honest online. The standard deviation shows how different the numbers are from the mean.

Seniors in high school can make better choices about the people they meet and the things they do online if they know how vital safety and ethics are in cyberspace (Christen, Gordijn, & Loi, 2020). People in this group are more likely to use two-factor authentication, make strong passwords, and avoid doing dangerous things online that could put user data at risk (Zhao, Llorente, & Gómez, 2021). Students in their last year of high school know a lot about internet ethics and safety. This shows how important it is for schools to teach digital skills, ethics, and good digital citizenship (Raab, 2020).

Correlation of Learning Styles and Digital Competence

Table 3. Test of Relationship Showing the Correlation of Learning Styles and Digital Competence.

Variables	Visual	Auditory	Collaborative
Ability to use digital Learning Tools	0.342**	0.326**	0.423**
Managing digital Learning Platforms	0.328**	0.327**	0.41**
Ability to use advance level of digital tools	0.243**	0.099	0.287**
Security and Ethics	0.388**	0.299**	0.349**
Overall	0.42**	0.337**	0.473**

* $p < 0.05$, ** $p < 0.01$

Table 3 shows the test of the relationship, which shows how learning styles and digital skills are connected. When the data are added together, they show a strong link between the ways that senior high school students choose to learn and how well they can use technology. Some of these factors are managing digital learning tools, using up-to-date digital technologies, and knowing about ethics and security. However, there needs to be a clear link between being able to use modern digital tools and learning to learn through hearing.

The idea that people's chosen ways of learning affect how well they can use technology is what the relationship between students' digital competency and their preferred learning styles means. Different types of learners may be drawn to digital tools and systems that work well with the way they like to learn (Guillén-Gámez et al., 2021). Knowing the type of learner in each class can help you create individualized lessons that meet each student's needs and tastes. Teachers can make learning paths for each student that fit their chosen learning style with the help of personalized learning platforms and adaptive learning technologies (Heidari, Mehrvarz, Marzooghi, & Stoyanov, 2021). This makes students more interested and motivated and helps them learn computer skills.

There is a strong link between a high school senior's ability to use cutting-edge digital tools and the way they learn best through hearing. This shows that there needs to be more discussion on how students who learn best through hearing interact with modern digital technology (Cabero-Almenara et al., 2022). Auditory learners do very well with listening to classes or following spoken instructions, but they need help to use complex digital tools and instead rely on visual or tactile touch (Lucas et al., 2021). This difference shows how important it is for digital competency programs to find and accommodate different learning styles. For example, students who learn best by listening may need extra help or different ways of being taught to master complex digital tools.

Personal learning experiences, cognitive tastes, and how one learns best can all change the

complicated and delicate link between digital competence and learning styles (Mehrvarz et al., 2021). There is a strong link between the ways that senior high school students prefer to learn and a lot of digital competencies. This has important implications for teachers, instructional designers, and lawmakers. The link between digital competence and learning styles shows how important it is to understand and help students with their unique learning styles in order to make them more interested, better at understanding, and better able to use technology for learning and growth (Martzoukou et al., 2020).

Regression Analysis for Digital Competence

Table 4. Regression Analysis for Digital Competence.

Predictor	Estimate	SE	t	p
Intercept	0.342**	0.326**	0.423**	
Visual	0.328**	0.327**	0.41**	
Auditory	0.243**	0.099	0.287**	
Collaborative	0.388**	0.299**	0.349**	
R ² = .518	0.42**	0.337**	0.473**	
Adjusted r ² + .268				
RMSE = .465				

The regression analysis results for digital ability can be seen in Table 4. According to the findings, there is a strong link between digital competence and learning style traits. It is important to note that both the visual and collaborative predictors have statistical importance ($p = 0.013$ and $p < .001$, respectively). Higher levels of digital skills are more likely to be found in people who prefer visual learning to other methods. Additionally, a vital link has been found between digital skills and cooperative learning methods. This shows that students' strong desire for group learning and their higher levels of digital proficiency are strongly linked. Group projects, discussions, and tasks where people work together are all parts of collaborative learning. Because it is not statistically significant ($p = 0.55$), it looks like the auditory predictor does not have much of an effect on digital ability.

With the result that the audio predictor is not very useful, teachers and instructional designers may focus on other learning styles, like what people like to see or work together, when making digital competency treatments and training programs. Zhao et al. (2021) say that strategies and tools that focus on kinesthetic, visual, or interactive learning styles may work better at helping students become digitally competent than those that focus on auditory learning. The R-squared value of 0.518 shows that the three model predictors—visual, auditory, and collaborative learning styles—account for about 51.8% of the variation in digital ability. This means that differences in these learning styles are likely to account for more than half of the differences in digital skill scores among the people being studied. However, the adjusted R-squared value of 0.268, which takes into account the model's complexity and the number of predictors, shows that the variables only explain 26.8% of the variation in digital ability. This shows that the learning styles that are looked at do have a significant effect on how digital competence is explained. However, there may be other, less well-known factors that affect senior high school students' digital competence results.

Root mean square error, or RMSE, shows the average difference between what the model said the level of digital skill would be and what it actually was. People say that the model's predictions are more accurate when the RMSE number is low because they are more in line with what was actually seen. With an RMSE of 0.465, we can see that the model's predicted scores are off by an average of 0.465 units from the

actual scores. To get a better idea of how accurate the prediction was, look at the dataset that was used and the predictions that were made. A smaller RMSE values a better estimate. Getting rid of the root mean square error (RMSE) makes the model more practical and better at guessing how well senior high school students will do on digital skills tests. The discovery that the way high school seniors learn visually and collaboratively has a significant impact on their digital skills but not on how they learn through hearing has many important implications for how we teach and help students learn. For starters, it shows how important it is for programs that aim to improve digital skills to know about and work with all kinds of learning types. Since visual and group learning are so important, teachers can change the digital classrooms and the way they teach to suit these styles better. To get students more interested in and good at using technology, it might be necessary to add collaborative projects, visual aids, and interactive activities to digital learning settings (Cabero-Almenara, Guillén-Gámez, Ruiz-Palmero, & Palacios-Rodríguez, 2022).

Also, the fact that the auditory style did not have little effect suggests that traditional audio-based teaching methods, like lectures or audio-based resources, might not be as good at helping senior high school students improve their digital skills (demerger & Konrad, 2021). Teachers need to think again about how much they rely on audio-focused lessons and find other ways to teach that take into account how much their students like visual and collaborative learning. This could include using multimedia resources, hands-on activities, and collaborative platforms to improve digital literacy and skill development. What these look like will depend on how the students like to learn (Hämäläinen et al., 2021). The fact that different learning styles have different effects on digital skills also shows how important it is to teach digital literacy in a way that includes everyone and is tailored to each student. It is important to include students who learn best by hearing in digital competency programs. On the other hand, some teaching methods and digital learning tools may be better for students who learn best by seeing and working together (Portillo et al., 2020). Teachers should try to make the classroom a warm, fair, and welcoming place to learn that gives all students, no matter what learning style they prefer, equal access to digital resources and chances and the tools they need to do well in the digital age.

IV. CONCLUSIONS AND RECOMMENDATIONS

There are clear patterns in how senior high school students learn and remember things, and they also strongly support particular ways of teaching. A lot of the time, these kids also have a high level of digital competence, which means they know how to use digital tools, apps, and online resources well. This shows that senior high school students learn in different ways and are good at managing the digital world, which is essential in today's culture that depends on technology.

To add to that, there is a strong connection between preferred learning styles and digital literacy, which includes knowing about ethics and security, being able to run digital learning platforms, and using complex digital tools. However, there is not a strong link between the ability to use advanced digital tools and the way people learn best—auditory learning—the regression analysis of digital competency. The visual and collaborative learning style indicators are statistically significant. However, the auditory predictor is not, indicating that it has no discernible impact on digital competence.

Senior high school students show clear preferences regarding their preferred learning methods, even if they typically possess a high degree of competency with digital technologies. The auditory learning style has a minor role, especially in advanced digital tool usage, even though there is a considerable association between learning style preferences and numerous areas of digital competence, particularly in using digital tools and managing platforms. The regression analysis results support the hypothesis that educators should prioritize visual and collaborative learning styles when creating digital literacy interventions for students, as

they significantly impact digital competence.

In order to improve students' digital competency, the researcher advises educational institutions to implement a variety of teaching methodologies that meet the needs of visual and collaborative learners. This could entail incorporating interactive exercises, group projects, and multimedia materials into online learning settings. When creating digital tools and platforms, technology developers and suppliers should consider senior high school students' varied learning preferences. User interfaces should be clear, visually appealing, and collaborative to support many learning styles properly.

Legislators should prioritize digital literacy programs when creating curricular frameworks and educational regulations so that all students, regardless of learning preferences, acquire fundamental digital skills. Funding and resources should also go toward professional development courses for teachers, which will improve their ability to incorporate technology and accommodate different learning styles in the classroom. More studies are required to understand further the connection between digital competency and learning styles in various age groups and educational situations. Studies that follow participants over time can show how well different teaching strategies and digital literacy initiatives promote digital competency.

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