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21ST CENTURY DIGITAL SKILLS AND ICT COMPETENCY AMONG TEACHERS IN CAMIGUIN: BASIS FOR INFORMATION TRAINING PROGRAM

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ABSTRACT

In today's digital era, teachers' possession of 21st-century digital skills and ICT competency is crucial for effectively engaging and educating students. This study aimed to assess the digital skills and ICT competency of junior high school teachers in Camiguin, with objectives to describe their characteristics, determine their level of digital skills, evaluate their ICT competency, examine the relationship between digital skills and ICT competency with their characteristics, and develop a technology-training program. The study used the descriptive-correlational method and included 250 junior high school teachers in Camiguin as respondents. A questionnaire by Lai et al. (2018) on 21st-century digital skills was used for measurement. Descriptive statistics and the Pearson product-moment correlation coefficient were employed to treat the data.

The findings revealed that most respondents were female, aged between 26 and 36 years. The majority held the position of Teacher 1, had completed master's degree units, and had been teaching for 5 to 10 years. The teachers displayed a positive attitude towards technology and attended school-level training and seminars. Generally, teachers demonstrated high proficiency in various 21st-century digital skills, including technical, information, communication, collaborative, creativity, critical thinking, and problem-solving skills. Competence in various areas of ICT, such as technology operations and concepts, social and ethical considerations,

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pedagogical strategies, and professional development, was good. Significant relationships were identified between teachers' digital skills and their age, teaching experience, and attitude toward technology. Therefore, it is recommended that a technology-training program may be considered to address the diverse needs of teachers, taking into account their age, experience, and attitude towards technology.

Keywords: *21st-century digital skills and ICT competency*

INTRODUCTION

It has become a challenge for teachers to help their learners improve their learning capacity, especially during the pandemic. So, integrating technology in delivering learning instruction is an important issue in many fields, including education. This is because technology has become the channel of knowledge and information in most countries. Our societies have gone through many transformations and innovations that have changed how people think, work, and live. As part of this, schools and other educational institutions that prepare students to live in "a knowledge society" must consider ICT integration in the classroom.

Therefore, it is important to determine teachers' technological preparedness in teaching with technology to provide intervention or training to teachers who lack ICT skills. There is a need to address this issue, for it will affect the school's performance, particularly in fulfilling the primary mandate of the learning institution. This is so basic that the impact cannot be taken for granted. The need to provide the necessary opportunities for the teachers who lack ICT skills to have it improved and upgraded is vital. Hence, this undertaking is a timely action for the given situation.

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Integrating Information, Communication, and Technology (ICT) in education refers to computer-based communication incorporated into daily classroom instruction. Teachers are the prime movers in using ICT in their daily classrooms to prepare students for the digital era. This is due to ICT's capability to provide a dynamic and proactive teaching-learning environment (Arnseth et al., 2017). While ICT integration aims to improve and increase the quality, accessibility, and cost-efficiency of imparting learning to students, it also refers to the benefits of networking the learning communities to face the challenges of current globalization (Albirini, 2016). The adoption process of ICT is not a single step but an ongoing and continuous step that fully supports teaching, learning, and information resources.

ICT integration in education generally means that teaching and learning are technology-based processes closely related to using learning technologies in schools. Because students are familiar with technology, they know that the issue of ICT integration in schools, specifically in the classroom, is vital within the technology-based environment. This is because technology in education contributes a lot to the academic aspects in which the benefits of ICT will lead to effective learning with the help and support of ICT elements and components. Almost all subjects starting from mathematics, science, languages, arts, cities, and other major fields, can be mastered more effectively through technology-based tools and equipment. In addition, ICT provides help and complementary support for teachers and students, involving effective learning with the help of computers to serve the purpose of learning aids.

Computers and technology are not replacing tools for quality teachers; they are considered add-on supplements needed for excellent teaching and learning. The advantages of ICT adaptation in education are crucial because, with the help of this, teaching and learning are not only occurring in the school environment but also can take place even if teachers and students are physically distant. However, ICT employment is not a one-step learning process but a continual learning process that provides a proactive teaching-learning environment.

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From the above premise, the researcher is interested in investigating the level of preparedness in teaching with technology among secondary teachers in the public secondary schools in the Division of Camiguin for the School Year 2022- 2023.

MATERIALS AND METHODS

Research Design

The study used descriptive-correlational research to examine and evaluate the significant relationship between 21st-century digital skills and ICT competency. The respondents were grouped based on different demographic characteristics to understand this relationship better. This research design was chosen as it provided a comprehensive study description. Chi's (2017) descriptive research study supported the decision to adopt this approach, which focused on identifying the development needs of students at a rural community college in the Southeast who lacked the necessary computer literacy skills for a basic computer course. The primary objective of this study was to explore "what is," which necessitated the use of observational and survey methods to collect descriptive data. Consequently, the study described the teachers' demographic characteristics, 21st-century digital skills, and ICT competencies while also determining the relationship between these variables.

RESULTS AND DISCUSSIONS

Problem 1. What are the respondents' characteristics in terms of:

1.1 Age;

1.2 Sex;

1.3 Highest Educational Attainment;

1.4 Position;

1.5 Teaching Experience;

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1.6 Training/Seminars Related to Digital Skills

1.7 Attitude towards 21st Century Digital Skills?

Table 1

Distribution of Respondents' Age

Age	Frequency	Percentage
46 years old and above	27	10.8
37-45 years old	68	27.2
26-36 years old	135	54.0
25 years old and below	20	8.0
Total	**250**	**100.0**

Table 1 revealed that out of 250 respondents, more than half are 26-36 years old, with the highest frequency of 135 (54%) of the total respondents.

Table 2

Distribution of Respondents' Sex

Sex	Frequency	Percentage
Male	52	20.8
Female	198	79.2
Total	**250**	**100.0**

It can be gleaned from Table 2 that out of 250 respondents, 198 (79.2 %) were females and only 52 (20.8%) were males.

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Table 3

Distribution of Respondents' Highest Educational Attainment

Highest Educational Attainment	Frequency	Percentage
Doctorate	3	1.2
With Doctorate Degree Units	7	2.8
Master's Degree	64	25.6
Completed Academic Requirements in MA	29	11.6
With Master's Degree Units	84	33.6
Bachelor's Degree	63	25.2
Total	**250**	**100.0**

The data in Table 3 presents the distribution of respondents on their highest educational attainment. Out of 250 respondents, 84 (33.6%) of the respondents had units in master's degree courses.

Table 4

Distribution of Respondents' Position

Position	Frequency	Percentage
Master Teacher II	4	1.6
Master Teacher I	11	4.4
Teacher III	68	27.2
Teacher II	50	20
Teacher I	117	46.8
Total	**250**	**100.0**

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Table 4 shows the distribution of respondents' positions. It gives the highest frequency of 117 (46.8%) to the Teacher 1 position among the two hundred fifty (250) respondents.

Table 5

Distribution of Respondents' Teaching Experience

Teaching Experience	Frequency	Percentage
20 years above	15	6.0
11-20 years	51	20.4
5 to 10 years	130	52.0
Less than 5 years	54	21.6
Total	**250**	**100.0**

Table 5 reflects the distribution of respondents' teaching experience. It can be gleaned from the table, out of two hundred fifty (250) respondents, more than half are 5 to 10 years of teaching experience in the field with the highest frequency of 130 (52%).

Table 6

Distribution of Respondents' Training and Seminars Attended on Digital Skills

Trainings/Seminars	Frequency	Percentage
International	21	8.4
National	28	11.2
Regional	34	13.6

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Division	59	23.6
District	46	18.4
School	62	24.8
Total	**250**	**100.0**

Table 6 shows the distribution of respondents' training and seminars related to digital skills. The results revealed that training/seminars at the school level obtained the highest frequency of 62 (24.8%).

Table 7

Distribution of Respondents' Attitude towards

21st Century Digital Skills

Indicators	Mean	SD	Description
I am confident to apply my technological skills in my daily work.	3.42	0.60	Strongly Agree
I feel comfortable doing my task with the use of gadgets.	3.58	0.49	Strongly Agree
I feel happy when students can perform tasks with the use of technology.	3.70	0.46	Strongly Agree
I have a positive attitude toward emerging technology.	3.68	0.49	Strongly Agree
I am comfortable applying my skills in the use of technology to enhance the delivery of my lesson.	3.60	0.51	Strongly Agree
I am proud that technology shall be embraced by all teachers to make their teaching livelier and more meaningful.	3.66	0.48	Strongly Agree

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I find technology fulfilling in that learners can use them to develop their creative and higher-order thinking skills.	3.60	0.50	Strongly Agree
I am amazed to use interactive technology to maximize class participation.	3.58	0.52	Strongly Agree
I agree with the idea that maximizing the use of technology allows learners to understand the world and its challenges.	3.59	0.54	Strongly Agree
I feel that using technology is a continuous improvement of classroom instruction.	3.71	0.46	Strongly Agree
Overall	**3.61**	**0.50**	**Strongly Agree**

Legend:

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

Table 7 presents the distribution of respondents in attitude towards technology with the overall mean of 3.61 (SD=0.50) described as **strongly agree.** It means that teachers hold positive attitudes towards the use of ICT in teaching. It further denotes that teachers ought to give high priority to the use of technology in the delivery of learning. Teachers have recognized that with the constantly evolving global landscape, it is essential for them to embrace a growth mindset towards teaching and learning. By cultivating a positive attitude towards education, teachers can leverage this outlook to enhance the quality of their instructional practices, thereby providing students with more impactful and meaningful learning experiences.

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Problem 2. What is the respondents' level of 21st century digital skills in terms of:

2.1 Technical;

2.2 Information;

2.3 Communication;

2.4 Collaborative;

2.5 Creative Thinking;

2.6 Creativity; and

2.7 Problem-solving?

Table 8

Distribution of Respondents' 21st Century Digital Skills in terms of Technical

Indicators	Mean	SD	Description
I know the basic functions of computer hardware components.	3.30	0.64	At All Times
I know how to use keyboard shortcuts.	3.31	0.68	At All Times
I can make PowerPoint presentations.	3.67	0.56	At All Times
I create documents and save files.	3.64	0.61	At All Times
I can draw a picture by using graphic editing software.	2.71	0.88	Most of the Time
I use audio, graphics, and animation in my presentations	3.16	0.75	Most of the Time
I can adjust computer screen brightness and contrast.	3.56	0.66	At All Times

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I can minimize, maximize, and move windows on the computer screen.	3.56	0.65	At All Times
I can convert adobe files to MS word.	3.20	0.83	Most of the Time
I can make reports like computing grades by using MS excel.	3.69	0.57	At All Times
Overall	**3.38**	**0.68**	**At All Times**

Legend:

3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low

2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

Table 8 presents the respondents' level of 21st century digital skills based on technical skills with the overall mean of 3.38 (SD=0.68) described as **at all times.**

Table 9

Distribution of Respondents' 21st Century Digital Skills in terms of Information

Indicators	Mean	SD	Description
I integrate internet as part of learner's instruction and activities.	3.39	0.66	At All Times
I download learning materials and do research using internet.	3.70	0.55	At All Times

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I utilized tablet, computer, (iPad) in Web searching, watching videos and playing educational games in the classroom.	3.39	0.65	At All Times
I suggest a change not only in schools' Internet and students' "acceptable use" policies.	3.24	0.62	Most of the Time
I allow learners to use social networking services (e.g., Facebook), watch Blogs (e.g., Blogger), Podcasts (e.g., Apple Podcasts) as part of the lesson.	3.12	0.70	Most of the Time
I allow students to use Internet Explorer, Safari, Chrome, and Firefox to search information.	3.45	0.60	At All Times
I created a filing system using OneDrive for the entire office to organize online documents	2.86	0.77	Most of the Time
I am proficient in HTML coding language and applied HTML coding to various front-end development websites.	2.22	0.80	Sometimes
I am skilled in website troubleshooting.	2.03	0.81	Sometimes
I can fix cybersecurity breaches for a network server.	1.90	0.82	Sometimes
Overall	**2.93**	**0.70**	**Most of the Time**

Legend:

3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low
2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

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Table 9 shows the distribution of respondents 21st century digital skills in terms of information skills with the overall mean 0f 2.93 (SD=0.70) described as **most of the time.**

Table 10

Distribution of Respondents' 21st Century Skills

in terms of Communication

Indicators	Mean	SD	Description
I send letters and other communications through email list and social networks.	3.32	0.67	At All Times
I use digital technology in communicating with my colleague.	3.54	0.58	At All Times
I adopt with the rise of social media and instant communications.	3.42	0.58	At All Times
I use digital devices in making communications.	3.22	0.64	Most of the Time
I am confident in recognizing phishing and spam in email.	2.92	0.78	Most of the Time
I am aware of social networking sites and online collaboration tools.	3.21	0.66	Most of the Time
I can share files and content using simple tools.	3.28	0.68	At All Times
I can communicate with others using mobile phone, Voice over IP (e.g. Skype) e-mail or chat – using basic features (e.g. voice messaging, SMS, send and receive e-mails, text exchange).	3.22	0.90	Most of the Time

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I can use digital technologies to interact with services (as governments, banks, hospitals).	2.94	0.90	Most of the Time
I am aware that when using digital tools, certain communication rules apply (e.g. when commenting, sharing personal information.	3.06	0.96	Most of the Time
Overall	**3.21**	**0.74**	**Most of the Time**

Legend:

3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low
2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

Table 10 shows the distribution of respondents' 21st century digital skills on communication with the overall mean of 3.21 (SD=o.74) described as **most of the time.**

Table 11

Distribution of Respondents' 21st Century Skills in terms of Collaborative

Indicators	Mean	SD	Description
I boost learning through collaborative practices such as guiding the students through the contexts of learning.	3.36	0.59	At All Times
I update other teachers with the new literacies of the 21st century.	3.02	0.63	Most of the Time
I increase comprehension and learning through collaborative online reading and writing practices.	3.10	0.66	Most of the Time

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I watch together with stakeholders' blogs and other online videos in connection to teaching-learning.	2.88	0.72	Most of the Time
I enrolled in online courses and take advantage of its convenience along with other teachers.	3.10	0.67	Most of the Time
I collaborate with officials for professional development.	2.91	0.72	Most of the Time
I engage with new technologies and advancements like blogging, podcasts, educational app and others.	2.84	0.73	Most of the Time
I offer opportunities with peers to collaboratively read, share and create content.	2.90	0.75	Most of the Time
I cooperate in local school-based online networks that share and exchange resources with parents.	2.85	0.74	Most of the Time
I collaborate with stakeholders to discuss new technologies that aid learning.	2.74	0.73	Most of the time
Overall	**2.97**	**1.00**	Most of the Time

Legend:

3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low
2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

Table 11 shows the distribution of respondents' 21st century digital skills in terms of collaborative skills with an overall mean 0f 2.97 (SD= 1.00) described as **most of the time**.

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Table 12

Distribution of Respondents' 21st Century Skills

in terms of Creativity

Indicators	Mean	SD	Description
I subscribe to digital journals and publications and introduce to learners.	2.62	0.75	Most of the Time
I localized and applied creatively educational publications.	2.69	0.71	Most of the Time
I keep up with current research to share with learners.	2.88	0.72	Most of the Time
I benchmark on best practices of new literacies in education.	2.86	0.73	Most of the Time
I allow learners to watch blogs as part of their learning activities.	3.04	0.61	Most of the Time
I assist learners to become critical consumers.	3.06	0.59	Most of the Time
I teach learners to critically evaluate the accuracy and reliability of information created online.	3.16	0.58	Most of the Time
I integrate new instructional models as part of instruction.	3.12	0.57	Most of the Time
I support struggling readers, especially in an online context.	2.95	0.67	Most of the Time

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I explore and develop new literacy skills in the classroom.	3.08	0.59	Most of the Time
Overall	**2.95**	**0.65**	**Most of the Time**

Legend:

3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low
2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

Table 12 shows the distribution of respondents' 21st century skills on creativity with the overall mean of 2.95 (SD=0.65) described as **at all times**.

Table 13
Distribution of Respondents' 21st Century Skills
in terms of Critical Thinking

Indicators	Mean	SD	Description
1. I provide interest-driven opportunities for learners' explorations.	3.20	0.56	Most of the Time
2. I implement inquiry base projects to encourage critical thinking of students.	3.15	0.59	Most of the Time
3. I help learners understand complex topic through video presentation or graphics.	3.26	0.57	At All Times

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4. I equip myself in a technology-based planning to meet students' academic needs.	3.19	0.58	Most of the Time
5. I make new technologies available in the classroom sufficient for learning.	3.06	0.61	Most of the Time
6. I effectively integrate new technologies into the curriculum.	3.09	0.57	Most of the Time
7. I research new instructional strategies that effectively use ICTs in the classroom.	3.12	0.67	Most of the Time
8. I administer professional development to teachers.	2.76	0.79	Most of the Time
9. I innovate teaching strategies through ICTs available.	3.01	0.71	Most of the Time
10. I infuse ICTs to ensure that teachers use new literacies for instruction.	2.93	0.67	Most of the Time
Overall	**3.08**	**0.63**	Most of the Time

Legend:

3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low
2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

Table 13 shows the distribution of respondents' 21st century digital skills in terms of critical thinking skills with the overall mean of 3.08 (SD=0.63) described as **most of the time**.

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Table 14

Distribution of Respondents' 21st Century Skills in terms of Problem-Solving

Indicators	Mean	SD	Description
I establish network to become more active and have good relationship among colleagues.	3.07	0.69	Most of the Time
I connect with other person and send a message if something important comes up.	3.38	0.55	At All Times
I adopt with the rise of social media and instant communications.	3.23	0.59	Most of the Time
I share about oneself with regards to particular problem.	3.10	0.67	Most of the Time
I guide the learners to at least, learn how to properly react socially to avoid trouble with someone.	3.30	0.58	At All Times
I keep up with a business like environment that's constantly evolving and changing.	2.97	0.65	Most of the Time
I impart to the school leaders the 21st-century skills to help solve some dilemma that arises.	2.96	0.66	Most of the Time
I manage to deal with the problem through the use of technology.	3.04	0.54	Most of the Time

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I apply etiquette, manners, and politeness in dealing with someone online to avoid dispute.	3.44	0.56	At All Times
I can figure out better solutions to a specific problem through the help of ICT.	3.10	0.59	Most of the Time
Overall	**3.16**	**0.61**	**Most of the Time**

Legend:

3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low
2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

Table 14 shows the distribution of respondents' 21st century skills in terms of problem-solving skills with an overall mean of 3.16 (SD=0.61) which is described as **most of the time**.

Table 15

Summary of the Respondents' 21st Century Digital Skills

Variables	Mean	SD	Description
Technical Skills	3.38	0.68	At All Times
Information Skills	2.93	0.70	Most of the Time
Communication Skills	3.21	0.74	Most of the Time
Collaborative Skills	2.97	1.00	Most of the Time
Creativity Skills	2.95	0.65	Most of the Time
Critical Thinking Skills	3.08	0.63	Most of the Time
Problem Solving Skills	3.16	0.61	Most of the Time
Overall	**3.10**	**0.72**	**Most of the Time**

Legend:

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3.26-4.00 – At All Times/Very High 1.76-2.50 – Sometimes/Low

2.51-3.25 – Most of the Time/High 1.00-1.75 – Never/Very Low

Table 15 presents the summary of the respondents' 21st century digital skills with an overall mean of 3.10 (SD=0.72) described as **most of the time**.

Problem 3. What is the respondent's level of ICT competency considering the following:

3.1 Technology Operations and Concepts;

3.2 Social and Ethical;

3.3 Pedagogical; and

3.4 Professional?

Table 16

Distribution of Respondents ICT Competency Considering

Technology Operations and Concepts

Standard 1

Indicators	Mean	SD	Description
I can Identify and define the functions of the main components (i.e. monitor, CPU, keyboard, mouse) of the computer.	3.50	0.59	Very Competent

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I can Identify and define the functions of computer peripherals (i.e. printer, scanner, modem, digital camera, speaker, etc.).	3.37	0.65	Very Competent
I can properly connect main components, configure peripherals and install drivers when required.	3.04	0.72	Competent
I can configure computer settings of various software and hardware.	2.74	0.77	Competent
I understand the basic functions of the operating system.	3.05	0.68	Competent
I organize and manage computer files, folder and directories.	3.42	1.88	Very Competent
I use storage devices (i.e. hard disk, diskette, CD, flash memory, etc.) for storing and sharing computer files. Create back-ups of important files.	3.37	0.62	Very Competent
I protect the computer from virus, spyware, adware, malware, hackers etc.	3.08	0.67	Competent
I use online and offline help facilities for troubleshooting, maintenance and update of applications.	2.90	0.78	Competent
Overall	**3.16**	**0.82**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 16 presents the distribution of respondents ICT competency in terms of technology operations and concepts - Standard 1 with an overall mean of 3.16 (SD=0.82), described as **competent**.

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Table 17

Distribution of Respondents' ICT Competency Considering

Technology Operations and Concepts

Standard 2

Indicators	Mean	SD	Description
I use a word processor to enter and edit text images.	3.35	0.72	Very Competent
I can format text, control margins, layout, and tables.	3.50	0.63	Very Competent
I can print, store and retrieve text documents from a word processor.	3.46	0.65	Very Competent
I use a calculation spreadsheet to enter data, sort data, and format cells into tables.	3.32	0.73	Very Competent
I can make computations, use formulas, and create graphs using spreadsheets.	3.29	0.71	Very Competent
I can print and store data tables using a spreadsheet application.	3.30	0.75	Very Competent
I use a presentation package to add text and sequence a presentation.	3.26	0.75	Very Competent

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I enhance slide presentations by adding sound, customizing animations, and inserting images.	3.30	0.75	Very Competent
I print presentation handouts and store slide presentations.	3.36	0.67	Very Competent
I make effective class presentations using slides and LCD projectors to acquire digital images and other media from web websites, flash drives, etc.	3.32	0.68	Very Competent
I crop scale, color correct, and enhance digital images.	3.24	0.72	Competent
I can play various media files using appropriate media players.	3.25	0.72	Competent
I can stitch together video footages and soundtracks and add sample enhancements transitions, title, etc.	3.07	0.79	Competent
I can attach and configure scanners, cameras, and cell phones to acquire digital images.	3.15	0.79	Competent
I store digital images using optical media (DC, DVD, flash disk) and online repositories.	3.16	0.78	Competent
Overall	**3.29**	**0.72**	**Very Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

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Table 17 presents the distribution of respondents ICT competency in terms of technology operations and concepts - Standard 2 with an overall mean of 3.29 (SD=0.72), described as **very competent**.

Table 18

Distribution of Respondents' ICT Competency Considering Technology Operations and Concepts Standard 3

Indicators	Mean	SD	Description
I can connect to the internet via dial-up of LAN	2.96	0.78	Competent
I can configure and use Web Browser and Help applications	2.74	0.76	Competent
I send and receive emails with attachment, manage emails and use LAN and Web-based email servers	3.06	0.71	Competent

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I effectively use synchronous and asynchronous web-based communication tools like instant messengers, voice and teleconferencing	3.02	0.72	Competent
I can connect and use shared printers, shared folders and other devices within a network	3.05	0.72	Competent
I Effectively use search engines, web directories and bookmarks	3.00	0.73	Competent
I download and install relevant applications including freeware, shareware, updates, patches, viewers and support applications	2.98	0.73	Competent
Overall	**2.97**	**0.73**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 18 presents the distribution of respondents ICT competency in terms of technology operations and concepts - Standard 3 with an overall mean of 2.97 (SD=0.73), described as **competent**.

Table 19

Distribution of Respondents' ICT Competency Considering

Technology Operations and Concepts

Standard 4

Indicators	Mean	SD	Description
I effectively use search engines, directories, crawlers and agents to locate information sources.	2.97	0.74	Competent

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I search and collect textual and non-textual information from online and offline sources.	3.00	0.68	Competent
I efficiently store and organize collected information using directories, drives, or databases.	3.02	0.62	Competent
I distribute, share, publish and print information via print or web.	3.01	0.73	Competent
I properly acknowledge information sources – online and offline.	3.10	0.66	Competent
Overall	**3.02**	**0.69**	Competent

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 19 presents the distribution of respondents ICT competency in terms of technology operations and concepts - Standard 4 with an overall mean of 3.02 (SD=0.69), described as **competent**.

Table 20

Distribution of Respondents' ICT Competency

Considering Social and Ethical

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Standard 1

Indicators	Mean	SD	Description
I understand the legal implications of software licenses and fair use.	3.06	0.69	Competent
I understand and explain the basic concepts of Intellectual property rights.	3.16	0.68	Competent
I can differentiate and identify the copyright, trademark, patent of various products.	2.97	0.79	Competent
Overall	**3.06**	**0.72**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 20 presents the distribution of respondents ICT competency in terms of social and ethical - Standard 1 with an overall mean of 3.06 (SD=0.72), described as c**ompetent**.

Table 21
Distribution of Respondents' ICT Competency
Considering Social and Ethical
Standard 2

Indicators	Mean	SD	Description
I detect plagiarism in students work.	3.10	0.66	Competent
I properly acknowledge sources used in own work.	3.16	0.62	Competent

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I can be an anti-piracy advocate for all products with IPR like music, data, video and software.	2.97	0.71	Competent
I advocate the responsible use of various technologies like computers and cell phones, etc.	3.26	0.63	Very Competent
I show respect for privacy and cyber etiquette, phone etiquette and similar use of technology.	3.34	0.62	Very Competent
Overall	**3.17**	**0.65**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair

2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 21 presents the distribution of respondents ICT competency in terms of social and ethical - Standard 2 with an overall mean of 3.17 (SD=0.72), described as **competent**.

Table 22

Distribution of Respondents' ICT Competency

Considering Social and Ethical

Standard 3

Indicators	Mean	SD	Description
I can demonstrate proper handling of computer devices and use of applications.	3.26	0.63	Very Competent
I monitor how students use the computer specifically on software, hardware, computer games, and internet activities.	3.01	0.65	Competent

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I maintain a clean and orderly learning environment for students.	3.42	0.59	Very Competent
I promote and implement rules and regulations on properly using computers.	3.26	0.64	Very Competent
I accurately report malfunctions and problems with computer software and hardware.	3.03	0.67	Competent
Overall	**3.19**	**0.64**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair

2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 22 presents the distribution of respondents ICT competency in terms of social and ethical - Standard 3 with an overall mean of 3.19 (SD=0.64), described as **competent**.

Table 23

Distribution of Respondents' ICT Competency

Considering Social and Ethical

Standard 4

Indicators	Mean	SD	Description
1. I design class activities to minimize the effect on students being disadvantaged or left-cut.	3.08	0.63	Competent
2. I help minimize the effects of digital divide by providing access to digital materials for all students.	2.99	0.69	Competent

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3. I prepare lessons and activities appropriate to the level of learning and cultural background of students.	3.22	0.62	Competent
4. I adapt activities using specialized hardware and software for physically disadvantaged students.	3.00	0.64	Competent
Overall	**3.07**	**0.64**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 23 presents the distribution of respondents' ICT competency in terms of social and ethical - Standard 4 with an overall mean of 3.07 (SD=0.64), described as competent.

Table 24

Distribution of Respondents' ICT Competency Considering Pedagogical Standard 1

Indicators	Mean	SD	Description
I make students use databases, spreadsheets, concept mapping tools and communication tools, etc.	2.86	0.71	Competent
I encourage students to do data analysis, problem solving, decision making and exchange of ideas.	3.03	0.71	Competent
Overall	**2.95**	**0.71**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

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Table 24 presents the distribution of respondents' ICT competency in terms of pedagogical - Standard 1 with an overall mean of 2.95 (SD=0.71), described as competent.

Table 25

Distribution of Respondents' ICT Competency Considering Pedagogical Standard 2

Indicators	Mean	SD	Description
I use appropriate slide presentations, videos, audio and other media in the classroom	3.38	0.62	Very Competent
I teach students to use various multimedia materials for the reports and class presentations	3.22	0.64	Competent
Overall	**3.30**	**0.63**	**Very Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 25 presents the distribution of respondents' ICT competency in terms of pedagogical - Standard 2 with an overall mean of 3.30 (SD=0.63), described as very competent.

Table 26

Distribution of Respondents' ICT Competency Considering Pedagogical Standard 3

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Indicators	Mean	SD	Description
I use various synchronous and asynchronous communication tools (email, chat. White boards, forum, blogs).	3.06	0.69	Competent
I facilitate cooperative learning and exchange of ideas and information.	3.22	0.61	Competent
Overall	**3.14**	**0.65**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair

2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 26 presents the distribution of respondents' ICT competency in terms of pedagogical - Standard 3 with an overall mean of 3.14 (SD=0.65), described as **competent**.

Table 27

Distribution of Respondents' ICT Competency Considering Professional Standard 1

Indicators	Mean	SD	Description
I can identify educational sites and portals suitable to their subject area.	3.10	0.68	Competent
I join online communities, subscribe to relevant mailing lists and online journals.	2.94	0.73	Competent
I review new and existing software for education.	2.85	0.69	Competent
I recommend useful and credible website to colleagues.	3.00	0.70	Competent
Overall	**2.97**	**0.70**	**Competent**

Legend:

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3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 27 presents the distribution of respondents' ICT competency in terms of professional - Standard 1 with an overall mean of 2.79 (SD=0.70), described as **competent**.

Table 28

Distribution of Respondents' ICT Competency Considering Professional Standard 2

Indicators	Mean	SD	Description
I conduct research on the use of technology in the classroom	2.75	0.81	Competent
I follow online tutorials or online degree programs	2.79	0.73	Competent
I actively participate in online forums and discussion	2.78	0.73	Competent
Overall	**2.77**	**0.76**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair
2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 28 presents the distribution of respondents' ICT competency in terms of professional - Standard 2 with an overall mean of 2.77 (SD=0.76), described as competent.

Table 29

Distribution of Respondents' ICT Competency Considering Professional Standard 3

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Indicators	Mean	SD	Description
I publish (formal/ informal) research on the use of ICT in education.	2.47	0.83	Less Competent
I share lesson plans, worksheets, templates and teaching materials through course web sites.	2.77	0.78	Competent
Overall	**2.62**	**0.81**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair

2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

Table 29 presents the distribution of respondents' ICT competency in terms of professional - Standard 3 with an overall mean of 2.62 (SD=0.81), described as competent.

Table 30

Summary of Respondents' ICT Competency

Indicators	Mean	SD	Description
Technology Operations and Concepts	3.11	0.71	Competent
Social and Ethical	3.12	0.66	Competent
Pedagogical	3.13	0.67	Competent
Professional	2.79	0.75	Competent
Overall	**3.04**	**0.70**	**Competent**

Legend:

3.26-4.00 – Very Competent/Very Good 1.76-2.50 – Less Competent/Fair

2.51-3.25 – Competent/Good 1.00-1.75 – Incompetent/Poor

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Table 30 shows the summary of respondents' ICT competency with an overall mean of 3.04 (SD=0.70) described as **competent**.

4. Is there a significant relationship between the respondents' 21st century digital skills and their ICT competency and each of the following:

4.1 Age;

4.2 Sex;

4.3 Highest Educational Attainment;

4.4 Position

4.5 Teaching Experience;

4.6 Training/ Seminars Related to digital skills; and

4.7 Attitude Towards 21st century digital skills?

Table 31

Result of the Test on the Relationship between the Respondents' 21st Century Digital Skills and Each of Their Characteristics

Teacher-Respondents Profile	21st-Century Digital Skills Indicators							OVER ALL
	Techni-cal Skills	Infor ma-tion Skills	Com munic ation Skills	Collab o-rative Skills	Creat i-vity Skills	Critica l Thinki ng Skills	Proble m-Solving Skills	

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Age	0.209 0.001 S	0.083 0.191 NS	0.167 0.008 S	0.200 0.001 S	0.162 0.010 S	0.146 0.021 S	0.136 0.032 S	0.158 0.038 S
Sex	0.013 0.838 NS	-0.008 0.900 NS	0.051 0.422 NS	0.073 0.250 NS	0.066 0.299 NS	0.072 0.257 NS	-0.015 0.813 NS	0.036 0.540 NS
Highest Educational Attainment	-0.132 0.037 S	-0.203 0.001 S	-0.145 0.022 S	-0.095 0.134 NS	-0.140 0.027 S	-0.147 0.020 S	-0.063 0.321 NS	-0.132 0.080 NS
Position	0.195 0.002 S	0.075 0.237 NS	0.097 0.126 NS	0.073 0.250 NS	0.040 0.529 NS	0.016 0.801 NS	0.042 0.509 NS	0.077 0.351 NS
Teaching Experience	0.219 0.000487 S	0.113 0.075 NS	0.198 0.002 S	0.168 0.008 S	0.218 0.001 S	0.201 0.001 S	0.200 0.001 S	0.188 0.013 S
Training/Seminars Attended	-0.013 0.838 NS	0.011 0.863 NS	-0.048 0.450 NS	0.096 0.130 NS	-0.028 0.660 NS	0.004 0.950 NS	0.026 0.682 NS	0.007 0.653 NS
Attitude Towards Technology	0.398 0.00001 S	0.348 0.00001 S	0.409 0.00001 S	0.128 0.043 S	0.217 0.001 S	0.301 0.00001 S	0.327 .00001 S	0.304 0.006 S

Legend: *significant at p<0.05 alpha level S – significant NS – not significant

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Table 31 shows the relationship between the respondents' 21st century digital skills when grouped according to their characteristics. Overall, the results displayed that respondents' 21st century digital skills is significantly related to their age, teaching experience, and attitude towards technology as indicated by the Pearson r valued and the probability valued which is less than 0.05 which led to the rejection of the hypothesis.

Table 32

Result of the Test of the Relationship between the Respondents' ICT Competencies and Each of Their Characteristics

Teacher-Respondents Profile	ICT Competency Indicators				OVER ALL
	Technology Operations and Concepts	Social and Ethical	Pedagogical	Professional	
Age	0.149 0.018 S	0.173 0.006 S	0.232 0.000215 S	0.166 0.009 S	0.180 0.008 S
Sex	-0.068 0.284 NS	-0.103 0 .104 NS	0.002 0.975 NS	0.011 0.863 NS	-0.040 0.707 NS
Highest Educational Attainment	-0.122 0.054 NS	-0.162 0.010 S	-0.055 0.387 NS	-0.080 0.207 NS	-0.105 0.165 NS
Position	0.115	0.096	0.137	0.103	0.113

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	0.069 NS	0 .130 NS	0.030 S	0.104 NS	0.068 NS
Teaching Experience	0.185 0.003 S	0.117 0.065 NS	0.208 0.001 S	0.116 0.067 NS	0.157 0.034 S
Trainings/Seminars Attended	0.023 0.717 NS	-0.004 0 .949 NS	-0.066 0.299 NS	0.076 0.231 NS	0.007 0.416 NS
Attitude Towards Technology	0.465 0.00001 S	0.436 0.00001 S	0.375 0.00001 S	0.230 0.000245 S	0.377 0.00069 S

Legend: *significant at p<0.05 alpha level S – significant NS – not significant

Table 32 shows the relationship between the respondents' ICT competency when grouped according to their characteristics. Generally, the results divulged that ICT competency is significantly related to teachers' age, teaching experience, and attitude towards technology as indicated by the Pearson r value and the probability value which is 0.05 leading to the rejection of the hypothesis.

Table 33

Results of the Test of the Relationship between the Respondents' 21st Century Digital Skills and ICT Competencies

ICT Competency Indicators	21st-Century Digital Skills Indicators							OVER ALL
	Technical Skills	Informa-tion Skills	Communi-cation Skills	Collabo-rative Skills	Creativity Skills	Critical Thinking Skills	Problem-Solving Skills	

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Technology Operations and Concepts	0.632 0.000 S	0.519 0.000 S	0.590 0.000 S	0.384 0.000 S	0.502 0.000 S	0.554 0.000 S	0.513 0.000 S	**0.530** **0.000** **S**
Social and Ethical	0.603 0.000 S	0.614 0.000 S	0.599 0.000 S	0.440 0.000 S	0.571 0.000 S	0.636 0.000 S	0.541 0.000 S	**0.572** 0.000 **S**
Pedagogical	0.534 0.000 S	0.583 0.000 S	0.570 0.000 S	0.505 0.000 S	0.600 0.000 S	0.628 0.000 S	0.547 0.000 S	**0.567** **0.000** **S**
Professional	0.392 0.000 S	0.571 0.000 S	0.530 0.000 S	0.624 0.000 S	0.597 0.000 S	0.595 0.000 S	0.524 0.000 S	**0.548** **0.000** **S**

Legend: *significant at p<0.05 alpha level S – significant NS – not significant

Table 33 presents the relationship between the respondents' 21st century digital skills and ICT competencies. Results indicated that technology operations and concepts, social and ethical, pedagogical, professional are significantly related to the ICT competencies of the respondents as indicated by the Pearson r value and the probability value which is 0.05 leading to the rejection of the hypothesis.

Conclusions

Based on the indicated findings, the following conclusions were drawn:

The teaching workforce in this context is relatively young and early in their careers, but also relatively experienced. Pursuing further education is valued, as evidenced by the high percentage of respondents who had completed master's degree units.

The high level of technical proficiency exhibited by teachers suggests that they are well-equipped to integrate technology into their teaching practice. These skills are essential for effective teaching and learning in the digital age and can lead to improved student outcomes.

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The pedagogical competency of the teachers indicates that they possess effective skills and knowledge in integrating technology into their teaching methods to enhance student learning. This competency is crucial for ensuring that technology is used to enhance student learning and outcomes.

The significant relationship between teachers' 21st-century digital skills and their age, teaching experience, and attitude toward technology suggests that targeted professional development programs are needed to improve their digital skills regardless of age or experience.

Similarly, the significant relationship between teachers' ICT competency and their age, teaching experience, and attitude toward technology highlights the importance of designing professional development programs that meet the diverse needs of teachers. The programs should consider their age, experience, and attitude toward technology to help them develop and enhance their ICT competencies.

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