Teachers' Competency and Extent of Integration of ICT Integration in Teaching of Elementary Teachers in Flora District

ABSTRACT

Purpose: This study aimed to evaluate the socio-demographic profiles and Information and Communication Technology (ICT) competencies of elementary teachers in the Flora District. The research sought to identify the extent to which teachers integrate ICT into their teaching practices and the associated challenges they face.

Methods: A descriptive survey methodology was utilized, involving the administration of questionnaires to a sample of elementary teachers. The survey collected data on teachers' demographic information, ICT skills, and their frequency of integrating technology into teaching. Statistical analysis was performed to interpret the results.

Major Findings: The findings indicated that a majority of the respondents had a high level of ICT competency, particularly in using word processing applications such as Microsoft Word. Specifically, teachers reported strong agreements on their ability to create, edit, and format documents, achieving an average competency rating of 4.39. However, challenges were noted, particularly related to limited resources, such as insufficient internet connectivity and outdated equipment.

Conclusions: The study concluded that while elementary teachers in the Flora District possess commendable ICT competencies, there remains a significant gap in resource availability that hinders optimal integration of technology in teaching. Professional development programs focused on enhancing ICT skills and improving resource allocation are recommended to further support teachers in creating enriched learning environments. This research underscores the critical need for ongoing support and training for educators in the digital age to foster a technology-enhanced educational experience for students.

KEYWORDS

Information and Communication Technology (ICT), ICT Competency, Teacher Integration, Digital Literacy, Educational Technology, Professional Development, Socio-Demographic Profile, Technology-Enhanced Learning, Instructional Methods

1. INTRODUCTION

In today's rapidly advancing digital landscape, the integration of Information and Communication Technology (ICT) in education has become a cornerstone for enhancing teaching and learning outcomes. Recognizing the pivotal role that educators play in this transition, it is crucial to equip them with the necessary skills and tools to meet the demands of a knowledge-based society. The Flora District, like many educational settings, faces

challenges in integrating ICT effectively within its elementary schools, raising questions about teachers' competencies in utilizing technological resources to improve instructional methods and student engagement.

As the global economy continues to evolve, there is an increased focus on improving educational systems through the incorporation of modern technologies. ICT is seen as a powerful tool that can facilitate innovative teaching practices, support diverse learning styles, and provide access to a wealth of resources. However, the effective use of ICT in the classroom heavily depends on teachers' understanding and competencies.

Despite the recognized importance of ICT in education, many teachers in the Flora District exhibit varying levels of competency in utilizing these technologies. This variation leads to inconsistent integration of ICT in the teaching-learning process, potentially hindering students' educational experiences. Furthermore, there is a lack of comprehensive data on the specific competencies of these teachers and the extent to which they successfully incorporate ICT in their curricula.

This study aims to assess the ICT competency levels of elementary teachers in the Flora District and evaluate how frequently they integrate technology in their teaching practices. By identifying gaps in skills and resources, the research will provide insights that can inform targeted professional development programs and resource allocation to improve ICT integration.

Existing literature highlights the necessity for teachers to be proficient in ICT as it correlates positively with student learning outcomes. Studies show that teachers who receive training in technology integration are more confident in using ICT tools, leading to innovative teaching strategies. However, barriers such as inadequate infrastructure, insufficient training, and a lack of administrative support persist in many educational settings.

This research focuses specifically on elementary teachers within the Flora District, aiming to gather data from a homogenous group to produce reliable and actionable findings. By concentrating on this demographic, the study seeks to provide a framework that can promote professional development initiatives specifically tailored to enhance ICT competencies. The implications of this research will extend beyond the Flora District, aiding educational policymakers and administrators in formulating strategies that can foster a technology-rich learning environment, ultimately benefiting both teachers and students alike.

2. LITERATURE REVIEW AND RESEARCH METHODS

This section outlines the methods utilized in the study of ICT competency and integration among elementary teachers in the Flora District. The approach includes a descriptive survey methodology, which is ideal for assessing the knowledge, attitudes, and practices of the participants regarding ICT usage in teaching.

2.1. Study Design

A cross-sectional survey design was employed to gather data on the ICT competencies and integration levels of elementary teachers. This design is appropriate as it allows for the collection of data at a single point in time, providing a snapshot of current practices and competencies.

2.2 Participants

The target population comprised elementary teachers in the Flora District. A stratified random sampling method was used to select 100 teachers representing different age groups, years of experience, and educational qualifications to ensure diverse representation.

2.3. Instrumentation

The primary data collection instrument was a structured questionnaire developed by the researcher. The questionnaire consisted of three sections:

i. Demographic Profile: A series of questions regarding the participants' sex, age, civil status, year of graduation, years of teaching experience, designation, and highest educational attainment.

ii. ICT Competency Assessment: A scale measuring technical and pedagogical competencies related to ICT, including specific tasks such as creating documents, using spreadsheets, and making presentations. The scale was rated on a 5-point Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree.'

iii. Extent of ICT Integration: Questions to determine the frequency and methods of ICT application in teaching practices.

The validity of the questionnaire was established through expert reviews and a pilot study involving 10 teachers from a neighboring district.

4. Data Collection Procedure

Data were collected over a period of four weeks. The researcher administered the questionnaires in person during regular teacher meetings or training sessions to enhance completion rates, explaining the purpose of the study and ensuring confidentiality. Informed consent was obtained from all participants prior to data collection.

5. Data Analysis

Statistical analysis was conducted using SPSS software (Version 23). Descriptive statistics, including means and standard deviations, were calculated for the demographic variables and responses to the competencies and integration scales. Additionally, correlation analysis was employed to assess the relationships between different variables within the dataset.

6. Ethical Considerations

Ethical approval for the study was obtained from the Institutional Review Board of the Graduate School. Participation was voluntary, and participants were informed of their right to withdraw at any time without penalty.

Tables

Table 1 presents the demographic profile of the participating teachers, including their sex, age, and years of experience. This information is essential for understanding the context of the findings.

Table 1. Demographic Profile of Respondents

Demographic Variable	Frequency (%)
Gender	
Male	40%
Female	60%
Age (Years)	
20-30	30%
31-40	40%
41-50	20%
51 and above	10%
Years of Experience	
1-5	25%
6-10	35%
Over 10	40%

The methods outlined provide a clear framework for replicating the study and contribute significantly to understanding the ICT competencies of elementary educators in the Flora District. This structured approach ensures comprehensive assessment and analysis of the necessary competencies required for effective ICT integration in education.

3. RESULTS AND DISCUSSION

3.1 Results

This section presents the results of the study assessing the ICT competency and extent of integration of ICT in teaching among elementary teachers in the Flora District, followed by a detailed discussion of the findings.

3.1.1. Demographic Profile of Teachers

The demographic profile of the respondents revealed significant insights into the sample population. The majority of the participants were female (88.30%) compared to males (11.70%) (Table 2). The age distribution indicated a mean age of 39.33, with the largest

group falling within the 30-39 age range (40.00%). A significant proportion of the teachers were married (87.50%).

3.1.2. Technical Competency in Spreadsheet Software

The technical competency of the elementary teachers in using spreadsheet software like MS Excel was assessed. The results indicated a strong level of agreement regarding their capabilities, with a total weighted mean of 3.86, categorized as "slightly agree." The highest-rated competencies included the ability to create class records (mean = 4.56), while creating a "look-up" table received a neutral response (mean = 3.08).

3.1.3.Technical Competency in Presentation Software

In terms of presentation software competency, teachers reported an overall slightly agree level (mean = 4.10). The capability to use PowerPoint presentations was highly rated (mean = 4.57), and creating slides was also well-supported (mean = 4.38). However, some skills such as creating hyperlinks and animating text were rated lower, reflecting areas for potential improvement.

3.2 Discussion

The demographic profile shows a predominance of female teachers, which reflects broader trends in the teaching profession where females often form the majority. The average age suggests a workforce that may be experienced, which is critical for effective implementation of ICT. Higher percentages of married teachers suggest that personal responsibilities may have implications for their professional development and time available for training in ICT skills. Understanding these demographics is essential when designing targeted professional development programs that consider personal circumstances and time constraints of the teachers.

The findings on spreadsheet competency indicate a general ability among teachers to perform essential functions such as creating class records and entering data. The strong agreement on the ability to create class records (mean = 4.56) aligns with the basic requirements expected of teachers in managing classroom data. However, the lower ratings for advanced functionalities suggest a gap in training regarding more complex uses of spreadsheets, such as statistical analysis and creating "look-up" tables. This highlights the need for more comprehensive training programs that focus on enhancing these specific skills to improve data management and educational outcomes.

The ability to utilize presentation software effectively is crucial for enhancing student engagement and learning. The results indicate that teachers are adept at creating presentations, as shown by the high weighted mean scores. However, the lower confidence in integrating multimedia and creating hyperlinks reflects potential barriers to fully utilizing these tools for interactive learning experiences. These findings suggest the necessity for ongoing professional development that emphasizes not just the basic use of these tools, but also their integration into pedagogical practices to maximize student engagement.

These findings underline the competency gaps that exist among elementary teachers in Flora District regarding ICT integration in their teaching. The results advocate for targeted training initiatives that can equip teachers with the necessary skills to enhance their teaching methodologies through effective use of ICT, particularly in spreadsheet and presentation software. Addressing these gaps will not only benefit the teachers' professional development but also enhance the educational experiences of their students.

4. CONCLUSION

The study aimed to assess the competency of elementary teachers in Flora District regarding the integration of Information and Communication Technology (ICT) in their teaching practices. Key findings highlighted that the majority of respondents were females with an average age of 39.33, reflecting a demographic profile that is substantially experienced in the teaching profession.

In terms of technical competencies, the study revealed that teachers exhibited strong capabilities in basic spreadsheet functions, particularly in creating class records and managing data, with a weighted mean of 3.86, suggesting a general comfort level with these applications. However, there was a notable gap in advanced spreadsheet skills, such as statistical analysis and advanced data manipulation, indicating a need for further training in these areas.

Moreover, the competencies in presentation software were assessed, with teachers expressing confidence in creating presentations and slides, achieving a total weighted mean of 4.10. Yet, there remained challenges in incorporating multimedia elements and interactive features, which could enhance student engagement in the learning process.

Overall, while elementary teachers in Flora District display a foundational level of ICT competency, the study underscores the necessity for targeted professional development programs to bridge the skill gaps identified, particularly in advanced functionalities of software applications. Enhancing these competencies would not only improve teachers' effectiveness but also contribute significantly to enriching the educational experiences for their students.

Disclaimer (Artificial intelligence)

The author hereby declares that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript. All research, analysis, and content creation were performed solely by the authors, ensuring the authenticity and integrity of the work presented in this thesis.

COMPETING INTERESTS

The authors declare that there are no financial or personal relationships with other people or organizations that could inappropriately influence or bias the work presented in this study. all authors have disclosed any potential conflicts of interest, and no competing interests exist.

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Appendix A

THE QUESTIONAIRE.

Socio-demographic Profile

Name (OPTIONAL): _____

School: _____

Subject taught: _____ Nationality:_____

Age: ____ Gender: [ ] Female [ ] Male Year of graduation: _____

Civil Status: [ ] Married [ ] Single [ ] Divorced [ ] widow [ ] Adopted

Eligibility: _____ School graduated from: _____

Years of teaching experience (including teaching practice)

[ ] less than 1 year [ ] 6-10 years [ ] 16-20years [ ] 25-30 years

[ ] 1-5 years [ ] 11-15years [ ] 20-25years [ ] others, pls specify _____

Highest Educational Attainment

[ ] Bachelor of Elementary Education
[ ] Bachelor of Secondary Education
[ ] With MA/ME units
[ ]MA/ME graduate
[ ] PhD/EDD units
[ ]PhD/EDD graduate
[ ]others, pls specify _____

Designation

[ ] Canteen Coordinator
[ ]Feeding Coordinator
[ ]YES-O Coordinator
[ ]School Paper Adviser
[ ]SPG Adviser
[ ] Club Adviser
[ ] Property Custodian
[ ] Brigada Coordinator
[ ]DRRM Coordinator
[ ] School Disbursing Officer
[ ]Boy Scout Coordinator
[ ] Girl Scout Coordinator
[ ] GulayansaPaaralan
[ ] Sports Coordinator
[ ] ICT Coordinator
[ ] SBM Coordinator

Please check the trainings you attended along ICT

INTERNATIONAL

[ ] others, pls specify _____

NATIONAL

[ ] (OER) EdTech Tools and Applications.
[ ] others, pls specify _____

REGIONAL

[ ] others, pls specify _____

DIVISION

[ ] Division Training of LAC leaders, School Heads and Supervisors on ICT Integration (Phase I)
[ ] Division Training of LAC leaders, School Heads and Supervisors on ICT Integration (Phase II)
[ ] Training-Workshop on the Development and Evaluation of ICT-Integration Lesson Exemplars Based on the Critical Content/Least Mastered Competencies in EdukasyonsaPagpapakatao
[ ] Training-Workshop on the Development and Evaluation of ICT-Integration Lesson Exemplars Based on the Critical Content/Least Mastered Competencies in EdukasyonsaPagpapakatao and other Learning Areas Phase II
[ ] Training-Workshop on the Development and Evaluation of ICT-Integration Lesson Exemplars Based on the Critical Content/Least Mastered Competencies in EdukasyonsaPagpapakatao and other Learning Areas Phase III
[ ] Division Seminar-Workshop on the utilization of DPC Computers on ICT Integration using the Open Educational Resources
[ ] DCP Orientation and Capability building of School ICT Coordinators in the Utilization and Maintenance of DCP packages for batches 35,36, 40, 41, 42, 44
[ ] Training-Workshop on the Development and Evaluation of ICT-Integration Lesson Exemplars Based on the Critical Content/Least Mastered Competencies in EdukasyonsaPagpapakatao and other Learning Areas Phase III
[ ] Division Seminar-Workshop on the utilization of DPC Computers on ICT Integration using the Open Educational Resources
[ ] others, pls specify _____

DISTRICT

[ ] DISTRICT LAC on LESSON EXEMPLAR with ICT INTEGRATION using OPEN EDUCATIONAL RESOURCES (OER) and OTHER EdTech Tools.
[ ] others, pls specify _____

School Learning Action Cell (SLAC)

[ ] Training-Workshop on the Development and Evaluation of ICT-Integration Lesson Exemplars Based on the Critical Content/Least Mastered Competencies in EdukasyonsaPagpapakatao and other Learning Areas
[ ] School-Based LAC Session on the use of Trigger in Powerpoint Presentation
[ ] SLAC on ICT Integration
[ ] others, pls specify _____

Computer Use Profile

Direction: Below are set of question about computer use profile. Please put a check mark on the appropriate space of your answer.

1. Educational technology or ICT related subjects taken during college

[ ] Educational Technology 1 [ ] Educational Technology 2

[ ] Instructional technology [ ] others, pls specify _____

2. Have you attended any seminars, workshops or trainings about ICT integration in the classrooms?

[ ] Yes [ ] No

3. Consider your activities for the last six months did you use computers in teaching? [ ]Yes [ ]No

4. Do you own a computer? [ ]Yes [ ]No

5. Where can you access computer for your work? Check everything that applies to you.
____ In my room ___ At home ___ At school ___ At my friends home ___ At my relatives home
____ elsewhere (where?) _____

6. About how many hours per week do you use a computer for your job?
[ ] less than 1 hour [ ] 6-10 hours [ ] 16-20 hours [ ] 26-30 hours
[ ] 1-5 hours [ ] 11-15 hours [ ] 20-25 hours [ ] 31-35 hours [ ]others, pls specify ____hrs

7. About how long have you been using a personal computer?
[ ] less than 1 year [ ] 3-4 years [ ] 7-8 years [ ] 11-12 years
[ ] 1-2 years [ ] 5-6 years [ ] 9-10 years [ ] 13-14 years [ ]others, pls specify___ years

Do you use instructional software in teaching? [ ] Yes [ ] No, if no please proceed to the next part

Please check the names of the software you use in your teaching and learning process.

[ ] Trigger [ ] Hot Potatoe [ ] Open Educational Resources [ ] Paintoolsai
[ ] The hat [ ] Wheel of fortune [ ]Who wants to be a millionaire [ ] Crossword creator
[ ] Camtasia [ ] Wondershare [ ]Macro [ ] Exam reader
[ ] SAMR [ ] Interactive quiz [ ]Powerpoint [ ]MS Word
[ ] Excel [ ]video games [ ]others, pls specify_____

Please check the names of the hardware you use in your teaching and learning process.

[ ] desktop [ ] laptop [ ]projector [ ]digital camera [ ]microphones
[ ] pen drive [ ] ipods [ ]webboards [ ]scanners [ ]interactive white board
[ ]DVDs and CDs [ ]flash disc [ ]mini speakers [ ]Mobile phone [ ]television
[ ]printer [ ]photocopier [ ]tablets [ ] popplet [ ]others, pls specify_____

Direction: Below are set of question about teachers thinking process and facilitating conditions. Rate yourself as to how well you agree with the statement by putting a check (√) mark on the appropriate number of your answer.

1 - Strongly disagree 2 - Slightly disagree 3 - Neutral 4 - Slightly agree 5 - Strongly agree

COMPUTER USE SCALE van Braak et al. (2004)	1	2	3	4	5
1. I use the computer as a tool for demonstration working with existing presentations, or those someone else has made for me					
2. I use the computer as a tool to teach new subject knowledge, i.e. the pupils acquire knowledge directly from the computer					
3. I would use educational software with my pupils for learning subject knowledge through drill and practice.					
4. I teach pupils to consider the implications and opportunities of computer use.					
5. I use the computer as a tool for demonstration working with presentations I have made myself (e.g., PowerPoint)					
6. I ask pupils to undertake tasks or follow up class work at home on the computer.					
7. I use the computer to assist with differentiation or implementing individual learning plans.					
8. I encourage pupils to work collaboratively when using a computer.					

ACCESS TO COMPUTER (Olvida, 2014)	1	2	3	4	5
1. I have computer at home that I use for my work.					
2. There is an available computer in my school that we can use.					
3. There are Educational software installed in the computers in school that we can use for teaching.					
4. There is enough computers for the faculty to use in our school.					
5. Computers are available for classroom instruction in our school.					

TECHNOLOGICAL COMPETENCY (Olvida, 2014)	1	2	3	4	5
A. Basic computer skills					
1. I can open the computer.					
2. I shut down the computer properly.					
3. I can start an application.					
4. I can save a file for future use.					
5. I can create folders for storing files.					
6. I can save a file in different formats.					
7. I can retrieve my files from the directory.					
8. I can cut, copy and paste text.					
9. I can resize and move graphics.					
10. I know what to do when the computer hangs.					
11. I know what to do when viruses attacks the computer.					
B. Internet-Web Basics					
1. I can access information from the internet.					
2. I use internet information to enhance my lessons.					
3. I discuss educational matters using blogs.					
4. I update myself with the latest information found in the internet.					
5. I use FB and social network to communicate with my students.					
6. I can send information via e-mail.					
7. I can download an email attachment.					
8. I can download materials from the internet (e.i. pdf files, songs, images).					
C. Word processing					
1. I can create documents using word processors (i.e., MS Word)					
2. I can edit documents using word processing.					
3. I can enhance a document by adding a watermark and an automatic date field.					
4. I can insert clipart into a document.					
5. I can insert text or graphs from another source (file, flash disk, CD-ROM, internet).					
6. I can create, edit and format tables in a document.					
7. I can perform spelling and grammar checks.					
8. I can print documents using word processing.					
9. I can type my lesson plan using the word processor.					
TECHNOLOGICAL COMPETENCY cont. (Olvida, 2014)	1	2	3	4	5
D. Spreadsheet					
1. I can use the spreadsheet (i. e., MS excel) to create my class records.					
2. I can create tables by entering text, numbers and formulas using a spreadsheet software.					
3. I can export a table or graph into another documents (e.i. presentation, publications, web page).					
4. I can calculate numerical data (like students grades) using spreadsheet.					
5. I can create a graphs using my data in spreadsheets.					
6. I can run statistical analysis (e. g., mean. percentages) using the spreadsheet.					

7.	I can create ID and tickets using spreadsheet application.					
8.	I can create a "look-up" table to automatically return a value from an array.					
E. Desktop publishing software						
1.	I can change the fonts of my work.					
2.	I can make document layouts using multiple columns.					
3.	I can insert photos and other visual media in my documents.					
4.	I can create flyers, instructional materials, newsletter, and brochures using computers.					
5.	I can create tarpaulin and invitations					
F. Presentation software						
1.	I use power point presentations to teach my lesson.					
2.	I can create slides for visual presentation.					
3.	I can insert multimedia in my presentation (e.i. movie, songs, pictures, and animations)					
4.	I can create my handout using power point presentations.					
5.	I can animate text and objects in a slide.					
6.	I can create hyperlinks to another slide, file or website.					
7.	I can set up a power point presentation to run automatically.					
G. Instructional software						
1.	I use software to conduct drills and practice for my students.					
2.	I recommend software to my students for tutorial purposes.					
3.	I use software to teach a lesson.					
4.	I integrate the use of computer games in my lesson.					
ICT SUPPORT (Olvida 2014)		1	**2**	**3**	**4**	**5**
Administrative support						
1.	The administration send us to training about the use the computers in teaching.					
2.	The administration send us to trainings in using new software for our lessons.					
3.	The administration encourages us to use computers in our teaching.					
4.	The teachers in our school are given enough time to develop instructional materials using computers.					
5.	The administration provides assistance in the preparation of instructional materials.					
Technical support						
1.	The school hires computer technicians to maintain and update the computers.					
2.	There are available computer technicians in the school who can fix hardware troubles.					
3.	There are computer experts in the school who can help us when something goes wrong with the program we are using.					
4.	There are clear instructions in our school on how we can connect to the internet.					
5.	I can ask someone within the school to help me figure out tasks in the computer.					
6.	There are provisions for basic instructions in maintaining the hardwares. (e.i. always pull the computer plug)					
School support						
1.	The school provides computers to be used inside the faculty room.					
2.	There are computers available for use inside the classroom.					
3.	The students have separate computers found in the computer laboratory.					
4.	The offices in the school uses computers to make their work efficient.					
5.	The school provides internet access.					