

The Level of Utilization of Information and Communication Technology (ICT) Tools in Multigrade Classroom Instructions

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Abstract— Multigrade teaching, where learners of different grades are taught in a single classroom is a reality in the landscape of basic education in the Philippines. Most schools adopting this scheme belong to the last-mile learning institutions, which poses great challenges to learners, parents, and teachers. The thrust of the Department of Education along with the education delivery computerization program paves the way to making the presence of Information and Communication Technology (ICT) tools in the country's schools, which is found to be a possible mechanism for enhancing the teaching practices of teachers and the learning experiences of learners in multigrade setting. Guided by the cited supposition, this study was conducted in Sorsogon City, particularly in the seven (7) elementary schools offering multigrade classes. This study assessed the multigrade teachers' access, competence, training, and support provided along with the ICT. Likewise, the level of ICT utilization in multigrade instructions was looked into and the difficulties encountered in the process of adopting the tools were identified. Results showed that the multigrade teachers had satisfactory access to ICT tools and possessed satisfactory ICT skills. They were exposed to limited ICT training and provided with minimal support. They considered themselves practitioners in utilizing ICT tools in lesson preparation while viewing themselves as an apprentice in using the technology in lesson delivery and assessment. These multigrade teachers applied interactive presentations and digital simulations to provide differentiated instructions to the learners and oftentimes integrated the ICT tools to teach multiple grade levels simultaneously. These multigrade teachers encountered varied challenges along with ICT utilization in the multigrade setting primarily the lack of training, limited computer sets, software malfunction, unreliable internet, and financial constraint. Forming a professional learning community with multigrade teachers as members is suggested as a possible measure of addressing the issues. This professional learning community has to be provided with the proposed learning episodes, mainly designed for the effective adoption of ICT tools in multigrade teaching. These learning episodes are to be utilized in their learning action cells or group study.

Keywords— ICT tools, multigrade classes learning action cells, multigrade classroom instruction, professional learning community.

I. INTRODUCTION

The utilization of Information and Communication Technology (ICT) has become a fundamental aspect of 21st-century education. Different Education Institutions including The Department of Education (DepEd), play a vital part in developing pedagogical techniques that will help multi-grade teachers to be equipped with ICT competencies and skills. The DepEd guidelines highlight the use of inclusive, effective, and beneficial teaching strategies, stressing the significant role of ICT skills for Multigrade teachers in sustaining holistic learning.

Several guidelines were issued by DepEd highlighting the improvement of the competence and level of utilization of ICT tools of Multigrade teachers. DepEd Order No. 31, s. 2012, establishes the policy framework for the Multigrade Program, focusing on the imperative

of integrating ICT tools to address the diverse learning needs commonly occurring in multigrade classrooms. Complementing this, DepEd Order No. 2, s. 2015, furnishes directives on the allocation and utilization of learning resources, including ICT tools, to bolster the accomplishment of educational programs such as the Multigrade Program. Although not directly tied to ICT utilization, DepEd Order No. 48, s. 2017, underscores the holistic approach of DepEd in fostering conducive learning environments, which encompasses the provision of essential resources, including ICT tools, to support teaching and learning endeavors in multigrade contexts.

D.O. No. 23, s. 2004 was even made stronger by D.O. No. 78, s. 2010 entitled Guidelines on the implementation of DepEd Computerization Program (DCP). With the legal mandate of promoting the right of

all citizens to take appropriate steps in making education accessible to all, the DepEd is geared towards the transformation of education through the DCP. This program aims to provide public schools with appropriate technologies that would enhance the teaching-learning process and meet the challenges of the 21st century.

Technology offers advantages to educators beyond just enhancing instructional methods. There is a variety of ICT-related tasks that compose the work of a teacher. Because of this, teachers must know the use of ICT skills to keep up with the fast-moving computer-based technology. Through technology, teachers can relay information and facilitate communication with their students quickly. In this ever-changing world, teachers have learned to embrace the different innovations technology brings to provide the best learning experience for their students and help them achieve high academic achievement. Teachers must possess word processing skills, spreadsheet skills, database skills, electronic presentation skills, internet navigation skills, e-mail management skills, making videos, file management, installing software to a device, troubleshooting, using ICT tools, and many more. Teachers now use videos in teaching and to make the learning of pupils more meaningful, the use of localized and contextualized videos made by the teachers themselves is considered more effective, instead of just downloading ready-made videos on the internet. The use of electronic mail makes communication easier these days. Teachers who use this take advantage of the benefits it gives. Teachers are facing a paperless environment wherein reports/memorandums are no longer required to be printed but are just posted on a Facebook group or emailed or uploaded on a specific site. Technology is indeed very important to facilitate the work of a teacher better.

The National ICT Competency Standard (NICS) defines Information and Communications Technology (ICT) as the totality of electronic means to facilitate information collection, storage, processing, and presentation to end-users to support their activities. It entails computer systems, office systems, consumer electronics, and networked information infrastructures such as telephone systems, internet, fax machines, and computers (ISchool Webboard, 2012). The main purpose of ICT is to improve access to information and make communication more accessible, efficient, and easy. ICT is crucial since it fosters efficient communication, improves productivity, optimizes business operations, and allows innovation and collaboration (Brown, 2020).

Since technology ultimately aims to make human lives easier, generally speaking, ICT's goals and targets are the same.

Despite the benefits provided by ICT tools in education, some teachers are still struggling to fully adapt to these innovations and effectively integrate ICT tools in classroom instructions. In fact, according to Hyndman (2018), many teachers have struggled with the disruptions that technological devices may bring. Teachers struggle to use ICT in the classroom because of preferences on technology introduced, differing device capabilities and instructions, the need for more professional development, lack of adequate ICT infrastructure or support, and even alienated attention among students. In the Philippines, the challenges are rooted in infrastructure and facilities, human resources, and the need for a technological leader who will play a pivotal role in effectively integrating ICT into the curriculum (Tomaro, 2018).

With these precedents, the present study aims to assess the level of utilization of ICT tools by Multi-grade teachers in classroom instruction and identify the challenges they face when using ICT tools in classroom instruction. The study is deemed to contribute significantly to teachers, students, school administrations, parents, the Department of Education, and even future researchers regarding the importance of ICT adoption and the means to effectively integrate them into the teaching and learning process.

II. OBJECTIVES

This study aimed to assess multi-grade teachers' levels of utilization of Information and Communications Technology (ICT) tools in Multigrade classroom instruction.

Specifically, it identified the assessment of teachers regarding ICT access, competence, training, and support. The level of ICT utilization in multigrade instructions as assessed by teachers. How teachers utilize ICT tools in dealing with actual multigrade classroom instructions. The difficulties in utilizing the ICT in multigrade instructions and the proposed learning action cell may be designed to enhance the utilization of ICT in classroom instructions

III. METHODOLOGY

This study employed descriptive-quantitative research design. The study's respondents were multi-grade teachers in Sorsogon City Divisions. A total of 20

teachers were considered as the respondents of the study.

The questionnaire employed in this study was designed with a structured approach to comprehensively assess various facets of ICT utilization among teachers in multigrade classrooms. The statistical tools used in the study are frequency count, mean, and ranking.

IV. RESULTS AND DISCUSSION

The following results were gathered, analyzed and interpreted by the researcher based from the objectives of the study. Tabular presentation and textual analysis and interpretation were also used.

Teachers Assessment regarding ICT Access, Competence, Training, and ICT Support among Multi-Grade Teachers.

ICT plays an important role in education, especially in multi-grade. It enhances the educational process by providing diverse avenues for accessing education using a range of technologies, both online and offline. It enables the implementation of diverse and optimized

approaches and resources, resulting in a more interactive and captivating teaching experience. Although ICT has the potential to provide benefits, multigrade teachers often encounter difficulties in effectively incorporating ICT into their classroom education.

The following tables will help one understands how Multigrade teachers perceived ICT access, competence, training, and ICT support. It covers their perceived accessibility of ICT tools and resources, their confidence and proficiency in using these tools effectively, the amount of formal ICT training they have received, and the level of support they receive from their educational institutions and peers when using technology for instructional purposes. This concept delves into the viewpoints of teachers regarding their ability to access, acquire skills, receive training, and access support systems for information and communication technology (ICT). It provides valuable information on their preparedness and ability to utilize technology to improve teaching and learning in different classroom environments.

Table 1.1 ICT Access of Multi-Grade Teachers

Indicator	Weighted Mean	Description
Access to productivity software such as Microsoft Office, Google Workspace, or other software.	3.65	Satisfactory Evident
Sufficiency of ICT Learning Resources in school	3.60	Satisfactory Evident
Provide adequate training and support for teachers to effectively utilize ICT resources.	3.30	Moderately Evident
Availability of Internet Access	3.20	Moderately Evident
Stability of Internet Access	2.90	Moderately Evident
Average	3.33	Moderately Evident

Table 1.1 illustrates the perceived accessibility of Information and Communications Technology (ICT) tools among Multi-Grade educators within the educational divisions of Sorsogon City. The inquiry unveiled that the most satisfactory ICT availability within their respective institutions, as evaluated by the participants, pertains to the presence of productivity software like Microsoft Office, Google Workspace, and similar applications, garnering an average rating of 3.65 described as satisfactory evident. Additionally, the sufficiency of ICT educational materials in schools was

appraised to be reasonably evident, with an average score of 3.60 described as satisfactory evident. Nevertheless, the level of instruction and assistance extended to teachers for the efficient utilization of ICT tools was deemed relatively discernible, receiving an average mean of 3.30 described as moderately evident. Similarly, the respondents also perceived the existence of internet connectivity to be moderately discernible with a mean of 3.20 described as moderately evident. However, the participants identified the availability of internet connection as the least

conspicuous form of ICT accessibility in their respective institutions, with an average assessment of 2.90 described as moderately evident.

The findings may be attributed to the fact that Microsoft Office and Google Workspace software are the most common work tools that teachers may use in the fulfillment of their paperwork and such products are very much readily accessible and available. This may be the reason why most of the multi-grade teachers perceive these as the most satisfactorily evident ICT tools in their respective schools. Simply, Microsoft Office and Google Workspace software's are highly accessible in their designated academic institutions. These productivity software solutions are possibly seen to be essential for creating learning materials, handling administrative work, and promoting cooperation among students and colleagues.

Teacher's perceptions of good access to productivity software indicate that these technologies are readily available and dependable for supporting their instructional demands in school contexts. Meanwhile, the stability of internet access was found to be the least moderately evident ICT tool since just like in any area in the country, internet speed and stability are concern, hence, it being the least and moderately evident ICT access, may implies that internet stability is the least accessible ICT tool in their respective school divisions. The findings indicated that the stability of internet access is perceived to be the least moderately evident among the various aspects of ICT access assessed. As a result, the perceived instability of internet access may impede the smooth integration of technology into teaching methods, reducing the overall efficacy of ICT usage in the classroom.

Several studies support these findings. He et.al (2018) highlighted the importance of accessibility and perceived ease of use in the adoption of new technologies, aligning with the current findings that accessible and user-friendly tools like Microsoft Office

and Google Workspace are favorably perceived by teachers. Singhavi and Basargekar (2020) demonstrated that teachers' competence and positive attitudes towards ICT are significantly influenced by the availability and reliability of ICT resources, supporting the finding that readily available productivity software positively impacts teachers' perceptions. Additionally, Msafiri et.al (2023) identified internet connectivity issues as a significant barrier to effective ICT integration in schools, echoing the current finding that internet stability is a major concern affecting the overall efficacy of ICT usage in educational settings. These studies collectively underscore the importance of accessible and reliable ICT tools in enhancing teachers' productivity and the effective integration of technology in education.

The increased use of information and Communication technologies has changed learners into digital learners requiring teachers to integrate technology into their strategies and approaches. In this context, the attitude, technological knowledge, and skills of teachers are very important for a successful ICT integration. In their 2022 study, Akram et al. found that teachers perceive technology as a tool that improves instructional practice and promotes interactive learning. However, they also identified obstacles such as sluggish internet speed, inadequate infrastructure, and insufficient training that impede the successful incorporation of technology. The statement proposes that authorities should establish rules to ensure the effective utilization of ICT, allot funds, and offer chances for professional growth.

Additionally, the study conducted by Martinović & Zhang (2012), examined the perspectives of pre-service teachers regarding the availability of information and communication technology (ICT) in their training programs and placement schools. The study specifically focused on the issues faced, such as insufficient access to ICT resources. Understanding this, teachers gain valuable insights into the effectiveness of these programs in preparing them for the realities of ICT access in schools.

Table 1.2 ICT Competence of Multi-Grade Teachers

Indicator	Weighted Mean	Description
Equip with ICT Basic skills.	3.95	Satisfactory Evident
Utilize ICT resources in teaching.	3.85	Satisfactory Evident
Integrate ICT tools in the teaching-learning process	3.80	Satisfactory Evident

Aware of cybersecurity best practices and take necessary precautions to protect my digital assets.	3.35	Moderately Evident
Possess technical skills and knowledge to troubleshoot and resolve common ICT-related issues.	3.20	Moderately Evident
Average	3.63	Satisfactory Evident

Table 1.2 presents the perceived skill level of multi-grade instructors in Sorsogon City Divisions when using ICT tools. The result shows that the most prominent ICT skill is possessing fundamental ICT capabilities, with an average score of 3.95.

In addition, the proficiency in utilizing ICT resources for instruction was appropriately apparent, with an average score of 3.85. Similarly, there is a successful display of proficiency in integrating ICT technologies into the educational process, as evidenced by an average score of 3.80. Nevertheless, their competence in comprehending cybersecurity best practices and implementing necessary measures to protect their digital assets is seen to be quite evident, with an average score of 3.35.

Ultimately, the presence of technical talents and knowledge is found to have the lowest and relatively noticeable level of competence among all indicators, with an average score of 3.20.

The results implied that most of the multi-grade teachers are generally competent in using basic ICT skills while there is an utmost need to improve their technical skills and knowledge in troubleshooting and resolving common ICT-related issues.

This suggests that multigrade teachers are generally confident and proficient in using the basic ICT tools and software applications required for their teaching responsibilities.

Basic abilities may include utilizing email, accessing digital platforms, generating simple documents, and conducting online research.

The perception of good competence in ICT basics suggests that teachers have the fundamental knowledge and skills required to effectively integrate technology into their teaching activities.

This level of skill is required for using ICT technologies to improve teaching and learning experiences in multigrade classrooms.

These findings may be attributed to the fact that just like teachers, basic ICT skills may easily be acquired and applied but for technical skills and knowledge, this will need proper training and orientation from experts so that their competence in this aspect may be enhanced.

The results imply that most multi-grade teachers possess competence in basic ICT skills, highlighting a pressing need to enhance technical skills and troubleshooting knowledge (Roberto, 2024).

This suggested that while teachers exhibit confidence in utilizing essential ICT tools, there is room for improvement in navigating complex technological issues (Wright & Akgunduz, 2018).

Such findings underscore the importance of specialized training and support from experts to augment teachers' proficiency in ICT beyond basic functionalities (Akturk, A. O., & Ozturk, H. S. (2019).

Furthermore, the study conducted by Haydn 2007 (Common Needs and Different Agendas: How Trainee Teachers Make Progress in their Ability to Use ICT in Subject Teaching), directly investigated how trainee teachers develop their ICT skills for teaching specific subjects.

Their perceived competence would significantly influence their progress and confidence in applying technology. A teacher who feels competent in using ICT is more likely to embrace and integrate it effectively.

Table 1.3 illustrates the perceived level of ICT training among Multi-Grade teachers in Sorsogon City Divisions regarding Information and Communications Technology (ICT) tools.

The findings indicate that participating in any ICT-related training is the most moderately evident training received by the teacher-respondents from their respective schools, with a mean score of 3.20.

Table 1.3 ICT Training of Multi-Grade Teachers

Indicator	Weighted Mean	Description
Attend any ICT-related training.	3.20	Moderately Evident
Participate in any formal ICT training programs or courses.	3.05	Moderately Evident
Utilize learnings from the ICT training.	3.05	Moderately Evident
Conduct training and workshops for other teachers/ Multigrade Teachers.	2.50	Poorly Evident
Facilitate ICT training for teacher/ Multigrade Teachers	2.40	Poorly Evident
Average	2.84	Poorly Evident

Following closely are engaging in formal ICT training programs or courses, and applying knowledge gained from these training sessions, both of which showed similar levels of evidence with a mean score of 3.05. However, when it comes to conducting training and workshops for other teachers or multi-grade teachers, the evidence is relatively lower, with a mean score of 2.50. Furthermore, facilitating ICT training for teachers or multi-grade teachers shows the least evidence, indicating a lower level of training among the teachers with a mean score of 2.40.

Based on the findings, Multi-Grade Teachers perceive moderately high levels of attendance at ICT-related training. It means that, while some teachers have attended training sessions focused on ICT skills and applications, it may not be consistent among all teachers surveyed. The moderate level of evidence suggests that, while there is some engagement with ICT training opportunities, there may be space for improvement in terms of encouraging and supporting increased teacher participation. Facilitating Multigrade Teachers on ICT-related Training is poorly evident, this demonstrates a lack of organized efforts or resources dedicated to delivering ICT training that is specifically geared to the needs of teachers in multigrade classrooms. The poor evidence suggests that opportunities for structured professional development in ICT skills may be limited or inadequately implemented within the surveyed schools. It can be inferred from the results that generally, there is a need to improve ICT training among multi-grade teachers with ICT training as rated only between moderately and poorly evident. Specifically, there is a need to promote attendance in any ICT-related training and effective facilitating of such ICT training among the multi-grade teachers. Improving the availability of ICT training for teachers, particularly those who teach in

multigrade schools, could be critical in building their confidence and competency in using technology to improve student learning outcomes.

Multi-grade teachers perceive moderate levels of attendance at ICT-related trainings, indicating some engagement but with room for improvement in encouraging and supporting increased participation. However, facilitation of ICT-related trainings for multi-grade teachers is poorly evident, suggesting a lack of organized efforts or resources dedicated to addressing their specific needs. Overall, there's a clear need to enhance ICT training opportunities for multi-grade teachers to promote attendance and effective facilitation, ultimately improving their confidence and competency in using technology for student learning (Haarala-Muhonen, A., Myyry, L., Pyörälä, E., & Kallunki, V. (2023).

The findings of the study conducted by Rana (2023) explored teachers' perception of ICT training and their awareness of affordance theory, it shows that teachers recognize the potential of training. Understanding the affordance theory will allow us to examine the importance of how people perceive ICT training. Thus, NGOs can help teachers incorporate digital tools into collaborative and interactive learning.

Related studies further supported these findings, indicating that structured professional development in ICT skills may be limited or inadequately implemented in schools, particularly those with multi-grade classrooms (Wu, D., Yang et.al.,2022). This highlights the importance of addressing these gaps to ensure that teachers are adequately equipped with the necessary skills and support to integrate technology effectively into their teaching practices, ultimately enhancing student learning outcomes (Vandeyar et.al.,2024).

Table 1.4 ICT Support of Multi-Grade Teachers

Indicators	Weighted Mean	Description
Encourage to seek help and support from peers or mentors during the ICT training program	3.75	Satisfactory Evident
Receive constructive feedback and guidance from School heads/ trainers/ mentors to help me improve my ICT skills	3.65	Satisfactory Evident
Has access to technical support personnel who could assist with any hardware or software issues encountered	3.45	Moderately Evident
Receive adequate support on ICT Utilization.	3.20	Moderately Evident
Provide enough resources and help to develop and use new ICT skills	3.00	Moderately Evident
Average	3.41	Moderately Evident

Table 1.4 provides a detailed overview of the assessment of level of ICT support among Multi-Grade teachers in Sorsogon City Divisions concerning Information and Communications Technology (ICT) tools. According to the findings, the most satisfactory evident ICT support in their respective academic institutions is being encouraged to seek help and support from peers or mentors during the ICT training program, with a mean score of 3.75. Following closely is the receipt of constructive feedback and guidance from School Heads, trainers, or mentors to enhance their ICT skills, which is also found to be satisfactorily evident with a mean score of 3.65. Meanwhile, having access to technical support personnel who could assist with any hardware or software issues encountered is rated as moderately evident with a mean score of 3.45. Similarly, receiving adequate support on ICT utilization is also moderately evident with a mean score of 3.20. Lastly, providing enough resources and assistance to develop and utilize new ICT skills is perceived as the least and moderately evident ICT support received by the respondents, with a mean score of 3.00.

The results suggested that most of the multi-grade teachers get ICT support from peers and mentors concerning the use of ICT. That is, to learn and apply ICT skills, they seek help from their work colleagues. The findings suggest that encouragement to seek help and support from peers or mentors during ICT training programs is perceived to be satisfactorily evident among Multi-Grade Teachers. This suggests that teachers are properly supported and encouraged to work with their colleagues or seek mentorship when participating in ICT training efforts. This may be attributed to the fact that when asking for help in any matter, an individual will

most likely seek help first from their close friends or colleagues, which is the same way for teachers. Encouraging teachers to seek advice and encouragement from peers or mentors during ICT training programs may foster knowledge sharing, collaboration, and growth as professionals, eventually leading to the successful integration of technology into instructional techniques in multigrade classrooms.

This is why seeking ICT support from peers and mentors was satisfactorily evident among the teachers. Meanwhile, according to the findings, Multi-Grade Teachers believe that providing adequate resources and assistance in developing and using new ICT skills is moderately visible. It also implies that, while some resources and support mechanisms may be accessible, they may not always be sufficient or effectively used to satisfy the different needs of teachers in learning and using new ICT skills. The somewhat obvious level indicates that some effort is being made to provide resources and help for improving ICT competencies, but there may still be gaps or issues in guaranteeing their accessibility, relevance, and effectiveness. Improving the availability of tools and assistance for learning and using new ICT skills could help teachers effectively integrate technology into their teaching practices and adapt to changing educational needs in multigrade classrooms. Furthermore, there is a need for academic institutions to provide enough resources and help to develop and use new ICT skills among their teachers since this was perceived to be the least and moderately evident manifestation of ICT support. When teachers are provided with adequate resources, they will be able to effectively apply the knowledge and skills they have in ICT.

The findings underscored a reliance among multi-grade teachers on peer support for ICT assistance, indicating a satisfactory level of encouragement for collaborative learning during ICT training efforts. This peer-based support system not only facilitates knowledge sharing but also cultivates a culture of collaboration, fostering professional growth among educators (Steyn, G.M. (2017). Such collaborative endeavors contribute significantly to the effective integration of technology into instructional techniques within multigrade classrooms.

However, a moderate visibility regarding the adequacy of resources and assistance for developing and utilizing new ICT skills is evident. Despite existing efforts to provide support mechanisms, discernible gaps persist in ensuring their accessibility, relevance, and effectiveness (Habenicht & Goldhammer). This underscores the need for educational institutions to prioritize the provision of adequate resources, structured training programs, and ongoing support to empower teachers in leveraging technology effectively (Genlott et.al.,2019).

ICT has a big role in traditional classroom settings or through virtual platforms. A recent study by Al Alajbeg et al. (2023) delved into the pedagogical approaches practiced at the Zagreb University of Applied Sciences. The aim is to showcase the effectiveness of ICT in the learning process. Furthermore, it offers a valuable understanding on how information and communication technology (ICT) technologies can enhance the educational process.

Moreover, Batanero et al., (2020) emphasized the importance of digital competence for teacher

professional development and highlight a lack of adequate ICT training as a significant concern. This suggested that teachers perceive a gap between their actual training and the skills needed for effective technology integration.

Levels of ICT Usage in the Multi-Grade Classroom Instructions

Table 2.1 presents the usage levels of Information and Communications Technology in multi-grade classroom instructions concerning lesson preparation. The findings reveal distinct categories of proficiency among respondents in utilizing ICT tools for instructional purposes. The majority of respondents demonstrate a practitioner level of proficiency in integrating multimedia elements such as images, videos, and audio clips into lesson plans. This practice enriches the learning experience and accommodates diverse learning styles and preferences, as indicated by a mean score of 2.85 described as practitioner. Similarly, a significant portion of respondents exhibit a practitioner level of proficiency in conceptualizing lesson plans and instructional materials using ICT tools, scoring a mean of 3.65 described as practitioner. This highlights their adeptness in leveraging technology to design engaging and effective learning experiences. However, fewer respondents demonstrate a practitioner level of proficiency in designing lesson plans using ICT that incorporate diverse learning modalities and promote student engagement, with a mean score of 2.60 described as practitioner. In contrast, a smaller subset of respondents is categorized as apprentices in accessing curriculum standards, instructional frameworks, and educational guidelines to inform lesson plan development.

Table 2.1 Lesson Preparation

Indicator	Weighted Mean	Description
Integrate multimedia elements such as images, videos, and audio clips into lesson plans, enriching the learning experience and catering to diverse learning styles and preferences.	2.85	Practitioner
Conceptualize lesson plans and instructional materials using ICT tools	2.65	Practitioner
Design lesson plans using ICT that incorporate diverse learning modalities and promote student engagement	2.60	Practitioner
Access curriculum standards, instructional frameworks, and educational guidelines, providing valuable guidance and resources to inform the development of lesson plans that align with educational objectives and standards.	2.50	Apprentice

Create dynamic and interactive lesson materials using various software applications and digital tools, allowing for the customization of content to meet the specific learning needs and preferences of students	2.40	Apprentice
Average	2.6	Practitioner

Despite the importance of these resources in ensuring alignment with educational objectives and standards, respondents exhibit a lower mean score of 2.50 described as apprentice in this area. Finally, the least number of respondents are categorized as apprentices in creating dynamic and interactive lesson materials using various software applications and digital tools. This proficiency allows for the customization of content to meet specific learning needs and preferences, garnering a mean score of 2.40 described as apprentice. Overall, the findings underscore varying levels of proficiency among respondents in utilizing ICT for lesson preparation, indicating areas of strength as well as opportunities for further skill development and support. It can be gathered that the multi-grade teacher-respondents are considered practitioners when it comes to using multimedia elements in their lesson preparation.

The findings show that Multi-Grade Teachers understand the value of including multimedia components such as photographs, videos, and audio clips in their lesson plans. They are found to actively use images, videos, and audio clips in their lesson plans which is widely known as enticing instructional materials to use.

The findings highlight the importance of multigrade teachers embracing multimedia integration as a viable method for improving teaching effectiveness and creating inclusive learning environments in which all students can thrive. Meanwhile, the least of the respondents still have a lot to learn when it comes to creating dynamic and interactive lesson materials using different digital software or tools to address student preferences.

With them being considered apprentices, this calls for more training on technical ICT skills so that they may be able to use digital tools to create interactive instructional materials.

The findings show that this practice has not yet been properly developed or adopted among multigrade teachers. Despite the widely acknowledged value of tailoring information to student's particular learning needs and preferences, teachers may lack the necessary

experience or resources to properly use technology for this purpose. This highlights an area for growth and professional development in the teaching community, indicating a potential need for more training and support to enhance the integration of technology into instructional planning and delivery.

However, it's noteworthy that some teachers are still in the apprentice stage, particularly concerning the creation of dynamic and interactive lesson materials using digital tools.

This suggests a need for further training on technical ICT skills to empower teachers in leveraging digital tools effectively for interactive instructional material creation (Dogan et.al.,2021).

Despite the recognized benefits of tailoring information to students' learning preferences, the practice of utilizing technology for this purpose has not been widely developed or adopted among multi-grade teachers. This highlights an area for growth within the teaching community, emphasizing the importance of ongoing professional development to enhance technology integration in instructional planning and delivery.

The use of ICT in education is crucial in addressing the varied needs and expectations of many learners, which is a difficult undertaking within the limitations of traditional institutional structure.

The study of Anandan (2017) suggested that the role of ICT in education is pivotal in meeting the diverse needs and expectations of a large learner population, a task that proves challenging within the constraints of conventional institutional frameworks.

Through a range of established tools and technologies, ICT effectively caters to learners at different stages of their educational journey.

The teaching and learning process has changed from a traditional way that focuses on books, and teacher-centered, lecture-based methodologies into a more interactive, student-centered learning environment.

Table 2.2 Lesson Delivery

Indicator	Weighted Mean	Description
Use different ICT resources in lesson delivery.	2.65	Practitioner
Conceptualize instructional materials using ICT tools for lesson delivery.	2.60	Practitioner
Incorporate multimedia elements such as videos, animations, and interactive simulations into lesson delivery.	2.60	Practitioner
Create different instructional materials for lesson delivery.	2.55	Apprentice
Integrate online/ offline games, and interactive game-based learning platforms into lessons to engage, motivate, and reinforce learning objectives.	2.30	Apprentice
Average	2.54	Apprentice

Table 2.2 illustrates the levels of usage of Information and Communications Technology in multi-grade classroom instructions concerning lesson delivery. The results highlight varying degrees of proficiency among participants in integrating ICT into instructional practices. Most participants exhibit a practitioner level of proficiency in utilizing different ICT resources during lesson delivery, with a mean score of 2.65.

This indicates a competent utilization of technology to support and enhance the learning experience. Similarly, some participants demonstrate a practitioner level of proficiency in both conceptualizing instructional materials using ICT tools and incorporating multimedia elements such as videos, animations, and interactive simulations into lesson delivery, scoring a mean of 2.60. However, several participants are categorized as apprentices in creating different instructional materials for lesson delivery, with a mean of 2.55. This suggests a need for further development in designing and implementing diverse instructional materials using ICT tools. Furthermore, few respondents are described as apprentices in integrating online or offline games, as well as interactive game-based learning platforms into lessons, to engage, motivate, and reinforce learning objectives, with a mean score of 2.30. This indicates a lower level of proficiency in leveraging gaming elements for educational purposes. In summary, the findings highlight varying levels of proficiency among participants in integrating ICT into lesson delivery, signaling both strengths and areas for improvement. Efforts to enhance participants' skills in creating diverse instructional materials and leveraging interactive

elements for engagement are warranted to optimize the use of ICT in multi-grade classroom instructions.

The results suggested that in terms of lesson delivery, most of the multi-grade teachers can be considered as practitioners especially when it comes to using different ICT resources in delivering lessons.

This implies that they were adept and proficient in employing various technology tools and resources to enhance their teaching practices. It denotes that the teacher demonstrates a high level of skill and expertise in integrating Information and Communication Technology (ICT) resources such as multimedia presentations, interactive simulations, online resources, and educational apps into their lesson delivery. Meanwhile, the least of the respondents can be considered as apprentices in terms of integration of game-based learning which may imply the need to further promote its use in classroom instructions. It implies that they are still in the early stages of learning and improving their abilities in this field. As apprentices, they may be experimenting with introducing games and interactive platforms into their teaching techniques, but they may not yet have advanced to a high degree of competency or expertise. It also means that teachers are actively learning about the possible benefits and drawbacks of adopting game-based learning approaches to engage, motivate, and reinforce learning objectives in the classroom. While they may not have fully mastered this teaching style, they demonstrate an interest in and readiness to try new approaches to improve student engagement and learning results.

Research by Abdul et.al (2020) highlighted the proficiency of some teachers in utilizing multimedia presentations and online resources, reflecting the findings of this study regarding the adeptness of multi-grade teachers in using diverse ICT tools. Additionally, Adipat, S., Laksana, et al. (2021) emphasized the importance of promoting game-based learning approaches in classrooms to enhance student engagement, which resonates with the identified need for further promotion of this approach among apprentice teachers. These studies collectively underscore the importance of ongoing professional development and support to empower teachers in leveraging ICT resources effectively for enhanced lesson delivery and student learning outcomes.

ICT has rapidly emerged as a fundamental element of society. Teachers as facilitators inside the classroom must be equipped with skills and appropriate ITC tools to enhance the teaching-learning process. The study conducted by Oyenike and Muideen (2018) revealed that educators in Nigeria had a low level of familiarity with ICT tools, they had not been utilizing ICT tools in preparing students for future challenges and had not been effectively using ICT strategies for classroom instruction. The findings recommended that educators

should try to get themselves familiarized with ICT tools and effectively utilize ICT strategies for classroom instruction.

In addition, an Online assessment platform (About e-asTTle, 2023) demonstrated how ICT might transform the process of evaluating lessons. This web-based technology enables educators to generate, implement, and automatically evaluate assessments, thereby streamlining the process and delivering instant outcomes. Furthermore, it offers essential data analysis capabilities for monitoring student progress, identifying areas of learning deficiency, and customizing education. By utilizing a data-driven approach, teachers can make well-informed judgments and customize their teaching methods to cater to the unique needs of each student, thereby significantly improving the overall learning experience.

Table 2.3 shows the extent to which ICT is utilized in multi-grade classroom instructions for evaluating lessons. Based on the findings, the majority of the participants are categorized as novices when it comes to using various ICT tools to evaluate learners, with an average score of 2.55.

Table 2.3 Lesson Assessment

Indicator	Weighted Mean	Description
Utilize different ICT tools in assessing learners.	2.55	Apprentice
Create multimedia-rich assessments, such as digital presentations, videos, and multimedia projects.	2.45	Apprentice
Use online polls, surveys, and interactive quizzes for formative assessment.	2.00	Apprentice
Analyze assessment data through data visualization tools, dashboards, and learning analytics platforms	2.10	Apprentice
Record and save assessment data through different software applications	2.50	Apprentice
Average	2.32	Apprentice

Similarly, some individuals are also referred to as apprentices in terms of their ability to record and save assessment data using various software tools, with an average of 2.50. Furthermore, a subset of the participants are characterized as novices in the realm of developing multimedia-enhanced evaluations, such as digital presentations, films, and multimedia projects,

with an average score of 2.45. In addition, a small number of individuals are also novices in the field of evaluating assessment data using data visualization tools, dashboards, and learning analytics platforms, with an average proficiency level of 2.10. The respondents with the lowest level of experience are referred to as apprentices when it comes to utilizing online polls,

surveys, and interactive quizzes for formative evaluation. Their average score is 2.00.

Overall, the data suggest that multi-grade teachers are viewed as novices when it comes to utilizing ICT tools for assessing lessons. This indicates that multi-grade teachers are still in the first phases of acquiring skill in this aspect of teaching practice. They are beginning to explore the use of ICT technology in their evaluation procedures, but they have not yet achieved a high level of expertise. This also suggests that they have a significant amount of knowledge to acquire when incorporating ICT tools and resources into their student assessments. As apprentices, Multi-Grade Teachers may be actively acquiring knowledge about several ICT strategies for assessment, including online quizzes, digital portfolios, and assessment programs. Nevertheless, they can still be refining their abilities in effectively integrating these technologies into their assessment techniques and addressing any encountered challenges. Specifically, the incorporation of online surveys or interactive quizzes, such as Google Forms, has not yet been fully integrated as assessment tools by teachers.

Jones and Williams (2019) noted that while teachers may recognize the potential of ICT in assessment, they often lack the necessary expertise to effectively integrate these tools into their evaluation methods. Similarly, Theodorio, A. O. (2024) highlighted the need for ongoing training and support to help teachers navigate the complexities of using ICT for assessment purposes. These studies indicate a common trend of teachers being in the early stages of development when it comes to

incorporating ICT tools into assessment practices, emphasizing the importance of targeted professional development initiatives to enhance teachers' proficiency in this area.

ICT can be used to enhance the way we assess and evaluate students' skills and knowledge, focusing on developing their overall competence. The study conducted by Tran and Thuy (2023), investigated some trends in applying Information and Communication Technology (ICT) to the assessment process and analyzed the transition from assessing knowledge and skills to assessing mathematical competence as a guideline for assessment in teaching. It highlights three practical ways to use ICT in assessments: optimizing multiple-choice tests, enhancing peer assessment and self-assessment to involve students more actively in the evaluation process, and creating innovative learning tasks that use multimedia tools to make learning more engaging and effective. Based on the results integrating ICT into the assessment process can significantly enhance the way mathematical competence is evaluated, making it more comprehensive and effective for students' learning and development.

Utilization of ICT Tools in Classroom Instructions among Multi-Grade Teachers

Table 3.1 displays the utilization of ICT tools by the multi-grade teachers in their classroom instructions. The results indicate that most of the participants utilize ICT tools for whole-class instruction by employing multimedia content, interactive presentations, and digital simulations.

Table 3.1 Utilization of ICT Tools in Classroom Instructions among Multi-Grade Teachers

Indicator	Frequency	Rank
During whole-class instruction, ICT resources is used to display multimedia content, interactive presentations, and digital simulations, engaging students from various grade levels in dynamic and interactive learning experiences.	13	1
ICT is utilized to facilitate independent learning in one grade level while the teacher focuses on direct instruction with another grade level.	12	2
Employ ICT to create lesson plans with differentiated instruction, individualized learning activities, and adaptive assessments to meet the needs of students in different grades	11	3
During group activities in one grade level, ICT tools are employed to provide individualized practice or enrichment activities for students in other grade levels	9	4

ICT allows for simultaneous instruction across multiple grade levels, enabling teachers to deliver content asynchronously based on each group's needs	8	5.5
While one grade level does hands-on experiments or projects, others use ICT to complement or simulate learning.	8	5.5
During independent study periods, students in multigrade classes utilize ICT resources such as online textbooks, educational apps, and digital libraries to explore content at their own pace, access supplemental resources, and engage in self-directed learning activities	7	8
Leverage ICT to facilitate small group instruction, virtual breakout sessions, and collaborative learning activities, enabling students from different grade levels to engage in peer-to-peer interaction and cooperative learning experiences	7	8
Fosters peer interaction, collaborative problem-solving, and knowledge sharing among students through virtual learning environments and online discussion forums	7	8
ICT tools help multigrade teachers assess student performance data, spot trends, and adapt instruction and intervention to meet students' changing needs	6	10
ICT enables tailored instruction by offering audio recordings or digital texts to meet unique learning needs	5	11
Teachers can track progress and help students in different grades with real-time evaluation and feedback during small group activities using ICT	3	12.5
ICT resources allow interactive polls or immediate quizzes during whole-class instruction to assess grade-level understanding and participation	3	12.5

These tools effectively engage students from different grade levels in dynamic and interactive learning experiences. This usage has a frequency of 13 and is ranked as the most common. On the other hand, a smaller number of respondents use ICT tools for tracking progress and providing real-time evaluation and feedback during small group activities. Additionally, interactive polls or immediate quizzes are used during whole-class instruction to assess grade-level understanding and participation. This usage has a frequency of 3 and is ranked at 12.5.

The findings emphasize the importance of using technology into whole-class instruction as a means of increasing student engagement, encouraging active involvement, and supporting deeper learning in a multigrade setting. Multi-Grade Teachers that effectively use ICT resources can create dynamic and interactive learning environments that encourage student learning and accomplishment across grade levels. In general, this rating emphasizes the importance of technology in improving whole class learning and increasing student participation in multigrade

classrooms. With students who are more engaged to listen and learn when there are enticing visual presentations, ICT tools are very common pedagogical resources for teachers. However, its use for tracking progress and providing evaluation or assessment is still rather not yet very practiced by these respondents. This suggests that Multi-Grade Teachers see challenges or constraints in using ICT tools for real-time evaluation and feedback in small group activities. It could suggest a lack of knowledge about appropriate digital tools or strategies for effectively tracking student development and providing timely feedback in such a setting. Hence, there's a need to maximize the use of ICT tools among multi-grade teachers especially when it comes to using ICT tools for evaluations and assessments.

According to a study by Theodorio, A. O. (2024), ICT tools play a significant role in enhancing instructional practices and promoting student engagement in multi-grade classrooms. Similarly, Kumar, P. (2023) emphasized the benefits of incorporating ICT tools into teaching strategies to create dynamic and interactive learning environments. These studies underscore the

relevance of exploring the utilization of ICT tools among multi-grade teachers, highlighting the potential impact on teaching effectiveness and student learning outcomes.

The study conducted by YShaikh et al. (2022) investigated novel approaches for incorporating Information and Communication Technology (ICT) into the educational process. ICT facilitates understanding of complex processes by utilizing simulations, hence improving the validity of the learning environment. ICT can catalyze facilitating higher-order cognitive processes and fostering active engagement in the learning process. The incorporation of information and communication technology can energize both teachers and students. By efficiently employing this technology in the classroom, students and teachers can actively participate in the application of various ICT skills and gain a thorough comprehension of its advantages. ICT may enhance and enhance the learning and teaching process.

Difficulties in Using the ICT in Classroom

Instructions

Table 4.1 reveals the difficulties experienced by multi-grade teachers in using ICT in classroom instructions. Results show that the lack of training on how to effectively use ICT tools is the most challenging experience they have, which made it difficult to incorporate technology into their teaching methods with a frequency of 13 and rank first having been answered by thirteen respondents. Meanwhile, the lack of experience in using ICT tools; and the struggle to adapt

ICT tools to meet the specific learning objectives and curriculum requirements of each grade level they teach ranked tenth on the table with four (4) respondents answering were the least of the difficulties they experienced when it comes to ICT utilization.

It can be inferred from the findings that the lack of training on how to effectively use ICT tools, especially in their classroom instructions is what makes it the most difficult for multi-grade teachers to integrate ICT resources in their lesson preparation, delivery, and assessment.

This suggests that Multi-Grade Teachers see a substantial barrier to using technology in their teaching practices due to insufficient training and assistance in this area. Without sufficient training, teachers may struggle to use ICT tools to improve instructional delivery and engage students in learning activities. Providing training opportunities to equip teachers with the required skills and knowledge to incorporate technology into their teaching methods will help address this issue and empower instructors to fully utilize technology in the classroom. In addition, the lack of experience and the struggle to adapt to these resources add more to the difficulty that multi-grade teachers have in ICT utilization.

According to research by Bećirović, S. (2023), one common difficulty is the lack of adequate technical support and training for teachers, which can hinder their ability to effectively utilize ICT tools in teaching.

Table 4.1 Difficulties in using ICT in classroom instructions

Indicators	Frequency	Rank
Lack training on how to effectively use ICT tools, making it difficult to incorporate technology into their teaching methods	13	1
Managing different grade levels in one classroom makes it challenging to find ICT tools suitable for all students' needs and abilities	12	2.5
Technical issues with ICT tools, such as software glitches or internet connectivity problems, can disrupt lessons and create frustration for multigrade teachers.	12	2.5
Inadequate infrastructure, such as unreliable electricity or internet connectivity in rural areas.	11	4
Limited access to technology resources, like computers and internet connectivity, creates challenges for multigrade teachers wanting to integrate ICT into lessons	10	5.5

Budget constraints, limiting the ability to purchase or upgrade ICT equipment and software, thus hindering the integration of technology into their teaching practices	10	5.5
Lack of digital literacy skills among students in multigrade classes can present difficulties for teachers in effectively integrating ICT tools into their lessons	9	7.5
Limited access to ongoing support and professional development opportunities for multigrade teachers hinders their ability to stay updated on new ICT tools and teaching strategies	9	7.5
Frustration with the rapid pace of technological change and the need to continuously learn and adapt to new ICT tools and platforms	7	9
Lack of support from school administrators or policymakers who may not prioritize investment in ICT infrastructure or professional development for teachers.	5	10.5
Struggling to develop and prepare ICT-integrated lessons while managing varied classroom dynamics	5	10.5
Lack of experience in using ICT tools	4	12.5
Struggle to adapt ICT tools to meet the specific learning objectives and curriculum requirements of each grade level they teach	4	12.5

Additionally, Kaminskiene et al. (2022) highlighted issues such as limited access to technology resources and infrastructure constraints, which can impede the seamless integration of ICT in classroom instruction. These findings underscore the multifaceted nature of challenges encountered by educators when incorporating ICT into their teaching practices, emphasizing the need for targeted support and resources to address these difficulties.

Mrosso and Ndibalema (2024), assessed teachers' perceived role and limitations on using ICT as a pedagogical tool in enhancing English language fluency. The study utilized a descriptive case study methodology, including interviews, focus group discussions, and document analysis as data collection methods. Teachers recognized ICT as a significant teaching instrument for improving grammar, vocabulary, and precise pronunciation. Nevertheless, the utilization of ICT in English language instruction was constrained by inadequate ICT infrastructures, insufficient training, instructors' preparedness, and ambiguous policies. The report suggests that the government should prioritize investing in ICT facilities and ensuring reliable internet connectivity in secondary schools.

Understanding the use of ICT tools in multigrade classroom education is critical for improving teaching methods and student learning results. This seeks to

determine the extent to which multigrade teachers incorporate ICT tools into their educational practices. By identifying current practices and areas for improvement, educators can create focused interventions and support systems to maximize the benefits of ICT in multigrade classrooms.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the preceding findings, the researcher concludes that Multi-grade teachers have satisfactory competence and basic ICT but have limited access to ICT and minimal exposure to ICT training and receive limited support. Multi-grade Teachers considered themselves ICT practitioners in lesson preparation but apprentice in delivery and assessment. Multigrade teachers utilize ICT for interactive presentations and digital simulations to provide differentiated education and personalized practice to teach multiple grade levels simultaneously. Utilizing ICT in multigrade instruction faces difficulties like lack of training, selecting appropriate tools, software malfunctions, unreliable internet, limited computer sets, and financial constraints. A LAC plan is proposed, incorporating session guides on ICT utilization in multigrade instruction and addressing challenges in using ICT tools in multigrade class delivery.

Based on the findings and conclusions, the following recommendations are given: (1) Multigrade teachers be actively engage in self-directed learning opportunities such as online courses, workshops, and webinars to improve ICT skills. (2) Customized training programs for multi-grade teachers be provided to improve ICT use in teaching and evaluation. (3) Develop multigrade teacher professional development programs on advanced ICT, differentiated teaching, and individualized practice. (4) Capacity building for teachers with a focus on ICT tool utilization for the delivery of instruction be designed and provided to them during regular School-based LAC sessions. (5) The LAC plan be adopted in the regular conduct of the school-based learning and development sessions. (6) Researchers are encouraged to conduct research along with the following topics. (6.1) Best practices in the utilization of ICT tools in teaching. (6.2) The role of ICT in the development of numeracy and literacy of learners. (6.3) Leveraging ICT tools as instructional mechanisms in the alternative delivery mode of learning.

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