

**TEACHERS' PREPAREDNESS TOWARDS IMPLEMENTATION OF 21ST
CENTURY TEACHING COMPETENCIES IN LOWER PRIMARY
CLASSES OF IGANGA MUNICIPALITY**

BY

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DECLARATION

I **Muyama Josephine** hereby declare that this research dissertation titled “Teachers’ preparedness towards implementation of 21st Century Teaching Competencies in Lower Primary Classes in Iganga Municipality” Iganga District” is my original work and it has never been presented to any institution of higher learning for any academic award.

I am now submitting it to Graduate school Board of Kyambogo University with the approval of my supervisors.

Signature: _____

Date: _____

APPROVAL

This dissertation titled “Teachers’ preparedness towards implementation of 21st Century Teaching Competencies in Lower Primary Classes in Iganga Municipality” was developed with our guidance and it is now being submitted for examination with our consent as supervisors.

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DEDICATION

This dissertation is dedicated to the unsung heroes and heroines, the teachers of ECD who tirelessly nurture the minds of our future generation in all corners of Uganda. With boundless passion and unwavering commitment, they bring the transformative power of education to life, unlocking the infinite potential within each child they teach. They embrace the complexity of the learning framework together with the thematic curriculum, paving the way for a holistic and integrated learning experience that transcends the classroom walls.

They are mentors, role models and pillars of strength. With patience and compassion, they cultivate a nurturing environment where each child feels valued and encouraged to explore their unique talents and abilities. Their belief in children's potential becomes the fuel that propels the children towards greatness. Through their unwavering commitment, they weave together the threads of community, bridging gaps and fostering unity. They understand the power of education as a catalyst for change, empowering not only individuals but the entire generations. Their tireless efforts illuminate the path to progress, sparking a transformation that will resonate far beyond the boundaries of the classroom. The researcher celebrates the countless lives the educators have touched and the countless dreams they have ignited. Their work may often go unnoticed, but the impact they make is immeasurable. Their contributions lay the foundation for a brighter future, where the potential of every child, regardless of their background or circumstances can flourish. Dear teachers of rural primary schools in Uganda implementing the thematic curriculum, your commitment and resilience in service make you the beacons of education guiding the way towards a better tomorrow.

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LIST OF ABBREVIATIONS AND ACRONYMS

CCT	-	Coordinating Centre Tutor
CPD	-	Continuous Professional Development
DES	-	Directory of Education Standards
EAC	-	East African Community
EFA	-	Education for All
EGR	-	Early Grade Reading
ESSP	-	Education Subsector Strategic Plan
ICT	-	Information Communication Technology
KYU	-	Kyambogo University
MOES	-	Ministry of Education and Sports
NAPE	-	National Assessment Progress in Education
NCDC	-	National Curriculum Development Centre
NCDC	-	National Curriculum Development Centre
PGMs		Peer Group Meetings
PLE	-	Primary Leaving Examinations
PTC	-	Primary Teachers' College
RTI	-	Research Triangle Institute
SDG	-	Sustainable Development Goal
SPSS	-	Statistical Package for the Social Sciences
TDMS		Teacher Development and Management Systems
TEPs	-	Teacher Education Programmes
TIET	-	Teacher Instructor Education and Training
UNEB	-	Uganda National Examination Board

- UNESCO - United Nations Educational and Scientific Cultural Organization
- UTSEP - Uganda Teacher and School Effectiveness Project

ABSTRACT

The study was conducted on teacher's preparedness towards implementation of twenty first century teaching competences in selected lower primary classes in Iganga Municipality. The specific objectives of the study were to ascertain how the teachers of Iganga Municipality are knowledgeable about the twenty first century teaching competences, the 21st century teaching competences and practices being applied by lower primary class teachers to enhance 21st century skills among learners and the approaches that can be used to retool teachers of lower primary classes of schools in Iganga municipality to enhance their 21st century teaching competences. The researcher employed the qualitative approach for the study. Primary and Secondary sources were explored as the main sources for data. The sources used in obtaining data were from journals, articles, textbooks, magazines, and research publications. The researcher used purposive sampling method to select key subjects that participated in the study. The observation guide and interview guides were used as data collection instruments for the study. The researcher went on to analyze data using themes and coding for qualitative data which was presented. The target sample size was of 15 respondents from 5 schools. The findings indicate that the teachers are knowledgeable about some 21st century teaching competences like collaboration, critical thinking and creativity acquired from workshops and seminars organised by STIR education and EGR. However, there was a gap between teachers' understanding of the 21st century teaching competences and their ability to implement them effectively in their classroom activities. Conclusively, implementation of 21st century teaching competences in Iganga Municipality requires reforms like establishment of mentorship programs, improved teacher training on 21st-century skills and a reevaluation of curriculum and assessment practices.

The researcher recommends that stakeholders consider providing professional development through workshops, mentorship programs and online training on critical thinking, creativity, collaboration, communication and ICT to the teachers.

Chapter One

Introduction of the Study

1.0 Introduction

This chapter is an introduction to a study on teachers' preparedness and the enhancement of twenty first century teaching competences in lower primary classes of schools in Iganga Municipality. In this chapter, the background to the study, statement of the problem, purpose of the study, objectives, research questions, scope and significance of the study have been discussed.

1.1 Background to the Study

This section presents the background in four perspectives that includes historical perspective, theoretical perspective, conceptual perspective, and contextual perspective;

1.1.1 Historical Perspective

The evolving educational landscape of the 21st century has brought significant changes including dynamic teaching technologies and methodologies with emphasis on skills such as critical thinking, creativity, communication, collaboration, science and technology (Hammond & Osher, 2020). The 21st century characterized by globalization, emerging technologies, modernization and the changing demands of the world of work has implications on the kind of instruction in early childhood development classrooms globally (Alpaydin & Demiri, 2022). The demands of the 21st century have caused a shift of focus from purely academic outcomes to a more holistic view of child development. Recognizing that early childhood education is not solely about academic preparation but the holistic development of the child by advocating for curricula that address the cognitive, social, emotional and physical needs of young children. This shift has led to the inclusion of domains such as social-emotional learning, creativity for development of

the whole child (DiPaola & Wagner, 2018). Additionally, Alpaydin (2018), supplements that the 21st century has brought about rapid advancements in technology, globalization, and interconnectedness leading to the growing recognition of the need for ECD teachers to instill in young children, skills such as critical thinking, creativity, collaboration, communication and cultural awareness.

The teachers are required to be systematic, portraying evidence-based aspects of teaching competences of the 21st century while recognizing the importance of self-empowerment, fulfillment, the will, zeal, and preparedness to adapt strategies and practices required in the 21st century classroom. The teachers are required to have the will and the ability to positively influence their own lives and the world around them as well as the capacity to set goals, reflect and act responsibly to harness the emerging changes of the 21st century paradigm required of an ideal ECD classroom teacher (Kwon & Kim, 2019).

The beginning of the 21st century saw a shift in education towards integrating technology into the classroom. Teachers started to develop competencies related to using digital tools, creating multimedia content, and facilitating online discussions. The focus was on improving digital literacy and adapting pedagogical approaches to incorporate technology effectively. Mid to Late 2000s: During this period, the emphasis on technology integration continued, but there was also a growing recognition of the importance of other 21st-century skills, such as critical thinking, creativity, communication, and collaboration. Teachers began to explore ways to foster these skills in their students through project-based learning, inquiry-based approaches, and cross-disciplinary activities. 2010s: As the decade progressed, the concept of "21st-century skills" expanded further. Educators recognized the need for students to develop skills that would prepare them for an increasingly interconnected and rapidly changing world. This led to the identification

of competencies like global awareness, cultural competence, adaptability, and problem-solving. Teachers were encouraged to design learning experiences that encouraged students to think critically about global issues and work collaboratively with peers from diverse backgrounds. Additionally, the flipped classroom model gained popularity during this time, prompting teachers to develop competencies in creating engaging pre-recorded content and facilitating meaningful in-class discussions and activities. Teacher professional development also evolved, with a greater emphasis on peer collaboration, online learning communities, and continuous learning through webinars, conferences, and online courses. The flipped classroom model is an instructional approach in which the traditional roles of in-class instruction and homework are reversed. In this model, students are exposed to new learning content, often through pre-recorded videos, readings, or online modules, before coming to the physical classroom. This initial exposure to content outside of class allows students to engage with the material at their own pace, reviewing concepts they find challenging and preparing questions for deeper understanding. Classroom time is then repurposed for interactive and collaborative activities that build upon the pre-class content. Teachers facilitate discussions, problem-solving exercises, group projects, and hands-on activities that require students to apply their knowledge, work together, and engage in higher-order thinking. This approach aims to create a more dynamic and engaging learning environment, where students actively participate in their own learning journey and receive immediate feedback and support from peers and instructors

The training of early childhood teachers has evolved globally and in Uganda to meet changing needs and challenges. In the 21st century, teaching focuses on Education for All (EFA) and achieving Sustainable Development Goals (SDGs). This requires equipping teachers with skills to implement these goals in classrooms, schools, and communities.

The need to support teachers' professional growth has been recognized for many years, as seen in studies by Erikson (1959), Fuller (1969), (Cheong, 1970), and Katz (1972). Research by Borko (2010) linked teacher professional development (TPD) to better learning outcomes. UNESCO (2011) emphasized that quality teaching in ECD classrooms depends on quality training for teachers through Continuous Professional Development (CPD). In the 21st century, Uganda adapted its education system to equip teachers with modern skills like digital literacy, critical thinking, and global citizenship. In 2004, the Teacher Development and Management System (TDMS) was launched with the aim to enhance teacher training and development. The TDMS aligned teaching competences with societal needs, emphasizing education's role in national development and continuous professional growth for teachers. In 2013, the European Union advocated for a shift to a competence-based curriculum, focusing on practical skills and problem-solving over rote learning. This approach prepares learners for real-world challenges by applying knowledge to life situations. Uganda adopted a competence-based thematic curriculum in 2007 for early primary levels, organizing content around learners' needs and environments. Teacher preparation became crucial, as outlined in the Education Sector Strategic Plan (ESSP), which later shifted focus to improving education quality, relevance, and efficiency.

The Ugandan government through the new teacher policy (2019), emphasizes teacher effectiveness, efficiency, and quality because the TISSA study (2014) identified weaknesses in teacher development, such as limited opportunities for continuous professional development (CPDs). It highlighted the need to address these challenges to enhance 21st-century teaching competences for ECD teachers. The CPD training aims to fill gaps in initial teacher education (ITE) programs by equipping teachers with updated knowledge and skills, including advances in information and communication technologies (ICTs), communication, collaboration, critical and creative thinking. To address these issues, the Ministry of Education and Sports (MOES) developed a CPD framework in 2017. This framework supports evaluating, recognizing, and enhancing post-initial teacher training while promoting lifelong learning for teachers.

The CPD framework aims to address gaps in Initial Teacher Training programs by providing teachers with relevant and up-to-date knowledge and skills, including advancements in ICT. It seeks to create a cohesive plan to improve teacher effectiveness in Uganda. The framework also serves as a foundation for appraising, recognizing, and interpreting post-initial training while promoting lifelong learning among teachers.

Despite these advances and recommendations, little is documented about the knowledge, skills, and 21st-century teaching competences possessed by lower primary teachers in Iganga Municipality. There is limited information on their readiness to transition from traditional pedagogy to methods aligned with the evolving 21st-century economy. Without adequate preparation and enhancement of these skills, children may face challenges in adapting to future demands, potentially hindering their long-term success.

1.1.2 Conceptual Perspective

According to Wittmer, Petersen, and Puckett (2016), an Early Childhood Development (ECD) teacher for children aged 6 to 8 years is a professionally trained educator dedicated to supporting the developmental needs of young learners during their formative years. These educators play a pivotal role in promoting cognitive, emotional, social, and physical growth, thereby laying a solid foundation for lifelong learning. They establish nurturing and stimulating learning environments that encourage curiosity, creativity, and the development of essential skills such as communication, critical thinking, and collaboration. Furthermore, ECD teachers are tasked with tailoring their teaching strategies to accommodate the diverse needs of young children and integrating age-appropriate activities that correspond with developmental milestones and emerging global educational trends (Wittmer, Petersen, & Puckett, 2016).

In the context of Uganda, a lower primary teacher is an adult who has completed initial teacher training and is tasked with teaching children aged 6 to 8 years in primary school classrooms (Ministry of Education and Sports [MoES], 2018). These educators are responsible for supporting the developmental needs of young learners, encompassing cognitive, social, emotional, and physical growth. Additionally, they are required to integrate essential 21st-century skills, including critical thinking, creativity, communication, collaboration, and ICT use, into their teaching practices (MoES, 2018).

It is important to note that while specific skills may be adapted to suit the developmental stages of young children, cultivating these skills early enough can have long-term benefits for their overall growth and future success (Barron & Osher, 2020).

Educators need to deliberately be sensitive about enhancing 21st-century skills among learners to meet their contemporary needs (Gajewski, B., & Potoczniak, M. 2020). This transformation involves providing inclusive, equitable and quality education that fosters creativity, critical thinking, and problem-solving, preparing children to contribute actively to sustainable development. It focuses on improving the quality, relevance, and impact of education and skills development, with a continuous effort to optimize learning experiences and outcomes in alignment with the evolving needs of individuals and societies.

According to David Kolb's experiential learning theory, individuals acquire knowledge and develop skills through experience (Morris, T. H. 2020).

In Early Childhood Development (ECD) classrooms, one challenge to effective learning is teacher burnout which arises from prolonged stress and challenges, impacting ECD teachers' well-being and effectiveness (Gajewski & Potoczniak, 2020). This requires organizational support, such as retooling to mitigate burnout by equipping teachers with updated skills and strategies to meet the evolving demands of education (Johnson, 2020).

Retooling is a professional development process aimed at bridging the gap between teachers' existing competencies and emerging educational needs including updating teachers' instructional strategies, technologies and pedagogical approaches.

Additionally, teachers have to be exposed to Communities of Practice (CoPs) using collaborative spaces for ECD teachers to share experiences, resources, and mentorship through platforms like Facebook and NAEYC's Hello platform support online CoPs, fostering professional growth through discussions and networking (NAEYC, n.d.).

Through reflective practice and self-study teachers are encouraged to critically evaluate their practices and identify areas for improvement and supporting continuous learning and adaptation (Tas & Demir, 2021).

Preparing learners for an interconnected world requires teachers with robust pedagogical content knowledge (PCK) and subject knowledge for 21st-century skills development. Addressing deficiencies in initial teacher training through formal or non-formal professional development opportunities ensures teachers are equipped to foster these skills (Zahar & Hipkins, 2017). Teachers often acquire critical knowledge and skills not only during their initial training but also through ongoing professional experiences such as workshops, seminars, peer group meetings, and communities of practice. These experiences help them to continuously improve and bridge gaps in preparation, stay updated with new knowledge, foster creativity and adapt to the evolving learning environment (Osamwonyi, 2016).

To meet the demands of 21st-century teaching, deliberate efforts are needed to equip teachers with essential competences for lower primary education (Oecd, 2023).

These competences involve dynamic skills, knowledge and experiences that address the past, present, and future needs of learners Karakus, M., & Savas, A. C. (2022). Without them, teachers risk missing opportunities for professional growth and may struggle to contribute effectively to the collective expertise required in modern education. (Gümüş, 2022

1.1.3 Contextual Perspective

Teachers' preparedness to enhance 21st-century teaching competences refers to the willingness, readiness, and ability of early childhood education (ECD) teachers to adopt and effectively apply the pedagogical approaches, skills and knowledge required in the 21st century educational landscape. It encompasses their openness to change, their motivation to enhance their teaching practices and their capacity to adapt to new and emerging trends in education (Barron & Osher, 2020). While to enhance is a deliberate practice to improve, augment, or make something better in quality or value. It includes elevating, fostering or strengthening particular aspects of 21st-century skills such as critical thinking, creativity, collaboration, communication, digital literacy and global citizenship among teachers who in turn transfer these skills to their learners by playing a crucial role in enhancing 21st-century skills in their classrooms practices and preparing their young learners to thrive in a rapidly evolving and interconnected world.

Enhancing 21st-century skills among learners in ECD classrooms is crucial for their overall development and future success because these skills go beyond traditional academic knowledge and focus on equipping children with the abilities and attributes needed to thrive in the rapidly evolving 21st-century world. These skills should be integrated into the daily routines and activities of ECD learners rather than being treated as separate learning areas by providing a supportive and stimulating environment where teachers can facilitate the development of these essential skills among their learners and lay a solid foundation for their future success.

However, the transition of ECD teachers from 20th-century teaching competences to 21st-century teaching competences presents numerous encounters for them like challenges related to technological literacy, limited exposure to professional development, resistance to change, curriculum miss alignments and lack of access to the prerequisite resources which contribute to the difficulties teachers encounter as they face the realities in the 21st century classrooms. However, addressing these challenges requires a comprehensive approach that includes deliberately planed professional development programs, curriculum reforms and equitable access to resources that support ECD teachers in successfully transitioning to 21st-century teaching competences (Brown & Warschauer, 2017).

Limited access to resources, such as technology tools and high-quality digital content, can impede ECD teachers' ability to incorporate 21st-century teaching competences and practices in their day today lived experiences in their classrooms. A study by Ozdemir and Cavlazoglu (2021), highlights the importance of equitable access to technology and digital resources to ensure all ECD teachers can effectively embrace modern teaching methods but the lack of such resources magnifies the challenges faced by teachers in their transition. Besides that, the misalignment between traditional curriculum frameworks and the need for 21st-century skills presents a challenge for ECD teachers.

As noted by Lim and Chai (2019), existing curriculum guidelines may not adequately emphasize critical thinking, problem-solving, and digital literacy skills required for the 21st-century workforce which complicates the transition for ECD teachers who are expected to balance curriculum requirements with the integration of innovative teaching practices. Besides that teachers of ECD classrooms often face difficulties in integrating technology into their teaching practices due to a lack of technological literacy as documented by Collier and Adams (2019), who highlight that many ECD teachers have limited experience and knowledge about using digital tools effectively in the classroom and certainly impedes their ability to incorporate the 21st-century teaching practices that require the use of digital resources as they teach. Brown and Warschauer (2017), add that ECD teachers face challenges in accessing appropriate professional development opportunities to enhance their skills in 21st-century teaching practices.

The study reveals that limited resources and time constraints often hinder teachers' ability to participate in relevant training programs that can help them to enhance the necessary knowledge and skills to adapt 21st century skills. An additional struggle for ECD teachers to enhance 21st century teaching competences among their learners is their own resistance to change and also resistance from external stakeholders as noted by Martinez (2020), who notes that teachers in ECD classrooms resist adopting 21st-century teaching practices due to their comfort with traditional methods or fear of losing control in the classroom. Additionally, external factors such as parental expectations and standardized testing pressures may discourage teachers from deviating from conventional approaches and tend to teach learners to pass exams but not to acquire and adapt the requisite competences of the 21st century.

There is a growing realization that initial teacher training programs (ITTs) train teachers in theoretical knowledge which is not blended with practice and do not cater for the dynamics and perspectives of global changes required in the 21st century classroom. Teacher professional development programs for the 21st century should provide teachers with an opportunity to be equipped with the knowledge, skills and tools that are relevant and current to match the current changes that are occurring in the 21st century such as using modern learner centered teaching methods, carrying out action research, connecting to global classrooms with other teachers, embracing advances in Information Communication Technologies (ICTs) among others.

This calls for the deliberate retooling of the teachers of ECD with pedagogical content knowledge required in handling learners in lower primary classes and equipping them with the life skills and values to suit the global citizenship. Johnson (2018) on the other hand explains that the education system in Uganda is struggling to transit from missionary and colonial theoretical education since the country's independence. This challenge impedes desired improvements in competence-specific understanding of teaching practices as well as meaningful ways of supporting teachers in their professional development. Tumwesigye (2020) also notes that Uganda's education system continues to be confronted by key challenges like access to quality and relevant Education. She points out that the advent of COVID-19 demands that we rethink the trails to infuse e-learning to augment or replace our traditional classroom-centered teaching competences. She explains that the advent of the corona virus pandemic and its impact on the education system is an indication that education should be the first line of defense in crisis but not the first casualty as more than fifteen million children were out of school due to COVID-19 in Uganda (Deanna & Fanelli 2020).

The COVID 19 provocation necessitates a sustainable solution for education in emergencies with ready and well-prepared proficient teachers but the digital divide in Uganda indicates the enormous inequality gap in the attainment of online teaching (Tumwesigye, 2020). She asserts that policymakers must continue to seek long-term solutions that allow equitable education which is holistic by preparing teachers for lower primary in 21st century teaching competences for them to equally enhance these skills among their learners (Schleicher, 2018). The researcher conducted support supervision in Iganga municipality schools with the key areas of concern being teachers' knowledge gain on 21st century skills, their ability to apply 21st century pedagogy in their classrooms practices and tools they are using to enhance 21st century skills among their learners and the observations verified minimal knowledge and application of 21st century skills like creativity and innovativeness, use of teacher centered methods when teaching and a lesser amount of research done on issues affecting their practices.

It is important to note that if teachers are not urgently supported with deliberately structured programs for them to gain knowledge about 21st century teaching competences and apply them in their classrooms the implication is that they live and work in the 21st century but using methods, approaches and tools of the 20th century which has a serious effect on the learners who are left out of the global citizenship.

1.1.4 Statement of the Problem

In the rapidly evolving educational landscape characterized by technological advancements, changing learner needs, and evolving pedagogical approaches, Early Childhood Development (ECD) teachers face significant challenges in meeting 21st-century educational demands (The Must-Have 21st Century Skills for Kids, n.d.)

This is compounded by their reliance on traditional teaching methods that limit learner engagement, motivation and the development of higher-order thinking skills. Fitria et al. (2023) analyzed various research articles and noted that teachers often struggle with implementing 21st-century skill-based learning due to a lack of understanding and difficulties in applying critical thinking and components of creativity in their teaching. (Fitria et al., 2023)

Despite the global emphasis on 21st-century skills to ensure competitiveness in the workforce, teachers in ECD receive insufficient support in integrating technology into teaching, hindering learners' exposure to digital literacy, creativity, and collaboration skills (Bayır, 2016). Additionally, curriculum implementation is often skewed towards the cognitive domain. The National Association for the Education of Young Children (NAEYC) asserts that all domains of child development like physical, cognitive, social- emotional and linguistic domains are important and closely interrelated. They stress that focusing predominantly on one domain, such as cognition, without integrating others, can impede comprehensive development. This narrow focus fosters a teacher-centered and examination-driven approach that contradicts curriculum guidelines and results in unjust evaluations (Hamarat, 2019).

Without deliberate efforts to enhance ECD teachers' competencies in 21st-century skills, learners in Iganga Municipality risk being inadequately prepared to navigate the demands of a globalized world, limiting their potential for success and global citizenship.

1.3 Purpose of the Study

The purpose of this study was to develop insights from teachers of lower primary classes in Iganga Municipality about their knowledge gain and preparedness to enhance 21st century teaching competences in their day today classroom practices as they prepare and deliver lessons to their 21st century learners.

1.4 Objectives of the Study.

The objectives of the study were to:

- i. To analyze how teachers of lower primary classes in Iganga Municipality are knowledgeable about the 21st century teaching competences.
- ii. To examine the 21st century teaching competences and practices being applied by lower primary class teachers to enhance 21st century skills among learners.
- iii. To explore approaches that can be used to retool teachers of lower primary classes of schools in Iganga municipality to enhance their 21st century teaching competences.

1.5 Research Questions

- a) How knowledgeable are teachers of ECD in Iganga Municipality in the use of 21st century teaching competences?
- b) What 21st century teaching competences are being applied by lower primary class teachers to enhance 21st century skills among learners?
- c) What approaches can be used to retool 21st century teaching competences among teachers of lower primary classes in Iganga Municipality?

1.6 Scope of the Study.

This section presents the geographical scope, content scope and time scope of the study.

1.6.1 Geographical Scope

The study was conducted in selected schools within Iganga Municipality, Iganga District. Iganga municipality is in eastern Uganda within Busoga sub-region where the researcher is a resident C.C.T supervising Teacher in the CPTC of the catchment area of these schools. This came at the time of crossroads when Busoga region has persistently registered low learner achievements according to UNEB-NAPE assessment reports from 2015 -2019 consecutively and blame for the deficient performance has been placed on teachers' pedagogical practices. This requires teachers in Iganga Municipality to be prepared to use 21st century teaching competences.

1.6.2 Content Scope.

The study was restricted to teachers' preparedness towards the implementation of 21st century teaching competences among learners in lower primary classes of schools within Iganga Municipality, Iganga District. Specifically, teachers of lower primary classes and the head teachers provided the information documented in the study.

1.6.3 Time Scope.

The study has been conducted covering a period from the year 2018 to 2023 respectively

1.7 Significance of the Study.

The findings from this study may have a laudable contribution to government of Uganda especially MoES in devising means of re-skilling and re-tooling teachers of ECD to use 21st century competences for teaching lower primary classes. In addition, the findings from this study will provide information to District Education Officers (DEOs), District Inspectors of Schools (DIS), and (MoES) on how to support teachers to enhance their teaching competences in line with 21st century demands and requirements.

This study report is further expected to facilitate discussions at various levels on how teacher preparation in schools can be improved to integrate 21st teaching competences in lower primary classes. Finally, the study findings may also be used by lower primary class teachers to adjust or modify their teaching and learning practices to suit the needs of the learners in the 21st century by using 21st century teaching competences to enable them to become creative, innovative, and problem solvers in the ever-changing world.

1.8 Limitations of the Study

The limitations met in this study was a methodological shortcoming of the qualitative approach that does not explicitly explain the differences in the quality and quantity of information obtained from different respondents hence arriving at a consistent conclusion was difficult. In addition, the study used a small sample size, which limited the generalization of the findings to a larger population of teachers or ECD learners making it difficult to apply the findings to a broader context. Finally, the study focused on specific sets of teaching competences or skills, potentially overlooking other important aspects that contribute to effective teaching in the 21st century while a broader assessment of competences may provide a more comprehensive understanding of teachers' preparedness and their impact on ECD learners.

1.9 Delimitations

This study only focused on teachers' preparedness although there are other continuums of teachers who teach the same learners that are tailored toward improving 21st century teaching competence in lower primary classes. The data obtained from the 30 respondents interviewed was generalized to represent in the bigger population of Iganga Municipality schools and the researcher stuck to the interview guide and probed the respondents as much as possible for them to give accurate information which is in line with the question asked.

1.10 Theoretical Framework

This study was guided by David Kolb's theory of experiential learning (1984) which emphasizes learning by doing. It highlights the idea of converting concrete experiences into knowledge which leads to effective learning. Kolb's experiential learning theory is a four-stage learning cycle which highlights experience, perception, cognition, and behavior which can enable the teachers' skills to be measured commensurately with on job skills and requirements in the 21st century. (Kolb, 1984 as advanced by Fewster & Batterson, 2018)

Experiential learning is a process of learning from and through garnered experiences from thoughts, actions, events, conscious look at emotions, actions and responses then concretize the experiences into day today teaching and learning experiences in the classroom and the dynamics in the 21st century context. Experiential learning considers the individual learning process of the teacher as a learner who must address more concrete issues from vivid reality in the classroom, school, community, District, Country, and the wider Global village through processing information to add to the existing knowledge base.

The teacher is expected to derive meaning out of a context, absorb what has been learnt, conceptualize it and produce copying strategies and practices to apply the learnt knowledge in everyday life of work, individual professional development, and career growth. Aristotle (384-BCE) quotes that "for the things we must learn before we can do them, we learn by doing them." Therefore, teachers need to hone their 21st century skills by updating their content knowledge, soft skills, and pedagogical knowledge to keep pace with the changes brought about by the innovations and work demands of the 21st century. The teachers in the 21st century must reflect on their own actions to take a critical stance or attitude towards one's own practices or peers and engage in a process of continuous adaptation and learning.

Experiential learning involves paying critical attention to the practical values and theories which inform everyday actions by examining practice reflectively and reflexively leading to the developmental insights. The theory emphasizes intermingling teacher preparedness with the acquisition of 21st century skills by deliberately creating avenues for them to actively participate in CPDs, seminars, workshops, annual exhibitions, peer group meetings, and TDMS programs. These activities allow teachers to share experiences that help them to refine and improve on their practices and learn new skills. Teachers require pre-teaching induction, orientation, and apprenticeship programs to lay emphasis on the need to master Pedagogical Content Knowledge (PCK) and garner authentic experiences, create and maintain a stable feedback process between training and application of experiences through reflection and evaluation (Bruder, & Hamby, 2015).

Lower primary classes being a critical stage in laying a foundation for future learning, teachers handling these classes need to share experiences that can help them achieve competences in line with the 21st century such as effective communication, knowledge creation, digital literacy, innovation, problem solving, and creativity. This implies that teachers must adopt new practices, techniques, tools, and pedagogies to suit the learning styles of learners in the 21st century.

1.12 Study Operational Definitions of Terms.

Early childhood development refers to the physical, cognitive, emotional, and social growth and learning that occurs in children from birth to around eight years of age where they experience rapid brain development and acquire fundamental skills and abilities.

Child-centered approach refers to the teaching situation where teachers recognize the importance of actively involving children during the learning process and facilitating learners to meet their individual needs and interests.

Continuous professional development is the teachers' commitment to engage in continuous learning, stay updated with current research and best practices in education, and seek opportunities to enhance their knowledge and skills through workshops, conferences, collaboration with colleagues, and other professional development activities.

Collaborative learning is a teaching method where teachers facilitate group activities and encourage children to work together, fostering communication, cooperation, and teamwork skills to promote social development, problem-solving abilities, and the exchange of ideas among children.

College and career readiness are Skills and knowledge essential to prepare teachers for success in college and workforce preparation.

Critical thinking refers to a cognitive process that strives to use a wide variety of thought processes to analyze, evaluate, interpret, and synthesize information.

Cultural Sensitivity and Inclusion is where teachers appreciate and embrace diversity, diverse cultural backgrounds, and create an inclusive learning environment where all children feel valued and respected by incorporating culturally relevant materials and activities that reflect the experiences and identities of the children in their classrooms.

Digital information or information age refers to a period of history when technology has dynamically impacted society's ability to obtain and transfer information rapidly.

ECE&D Early Childhood Education and Development refers to both the educational (ECE) and developmental (D) aspects of young children's growth, integrating learning activities with broader developmental needs such as health, nutrition, emotional well-being, and socialization.

Enhancement means to improve, augment, or make something better in quality, value, or effectiveness, taking it to a higher level or optimizing its characteristics or features. Enhancement of competences involves making positive changes or additions that result in an improvement.

Holistic development: encompasses a more comprehensive view of children's development where teachers recognize the importance of fostering different developmental domains in cognitive, social, emotional, and physical aspects and design learning experiences that address multiple domains and create opportunities for children to develop skills beyond academic knowledge.

Innovative learning refers to instructional strategies, techniques and tools used to produce strong academic gains in learners' achievements.

Play-based learning is a situation whereby teachers recognize that play is a crucial aspect of children's cognitive, social, and emotional development and structure learning content that incorporates play based activities and create a supportive environment that promotes exploration, creativity, and problem-solving skills.

Professional development is an on-going process of learning, practice, and feedback that provides sufficient time and follow-up support to teachers to share their experience and expertise.

Learner-centered learning refers to an educational approach utilizing active learner's engagement as the teacher structures activities to address each child's unique learning needs, interests, and cultural backgrounds.

Teacher preparedness refers to the readiness of teachers who are in active service to effectively meet the needs of their learners and perform their teaching duties effectively comprising a combination of pedagogical skills, social and emotional competence, cultural awareness, and a commitment to on-going professional development, policies, reforms, and procedures.

Reflective Practice is a situation where teachers are encouraged to reflect on their instructional practices, evaluate their effectiveness, and adjust improve teaching and learning outcomes.

Technology Integration is the teachers, ability to have a basic understanding of educational technology and use it as a tool to enhance learning. This may involve incorporating educational apps, interactive digital media, or using electronic devices to support instruction and engage children in meaningful learning experiences.

Twenty first century teaching competencies refers to a set of key proficiencies necessary for understanding, learning, thinking, and teaching content knowledge for the 21st century.

Twenty first century learners refer to Digital natives connected to a global environment that allows for easy access to information and knowledge.

Twenty first century skills refer to Innovative expertise recognized as essential elements that ensure teachers are ready to meet the demands of an ever-changing and increasingly complex life, college, and work environment.

Technological literacy refers to the ability to effectively use technological tools to access, evaluate, integrate, create, and communicate information to enhance the learning process.

Teacher-centered learning: An approach to instruction in which the teacher's role is to impart knowledge through lectures while the learners' role is to listen.

1.13 Summary

The chapter presented the background to the study that gave a firm foundation for this study on teacher preparation and the achievement of 21st century teaching competences from historical to contextual perspectives and highlighted the concern why this study needed to be carried out. In addition, this chapter also identified pertinent areas of teacher preparation and 21st century skills that need to be decisively analyzed through review of scholarly articles to be discussed in the next chapter.

Chapter Two

Literature Review

2.0 Introduction

This chapter presents related literature reviewed on teachers' preparedness and the enhancement of twenty first century teaching competences in lower primary classes of schools in Iganga Municipality. The review has been structured around teachers' preparedness, their knowledge about 21st century teaching competences, the teaching competences they apply in teaching lower primary classes and ways in which they can be retooled to enhance 21st century teaching competences in their classrooms.

2.1 The Teachers' Knowledge of 21st Century Teaching Competences

In recent years, there has been an increasing emphasis on integrating 21st-century teaching competencies into early childhood education and development (ECE&D) classrooms. These competencies encompass critical skills such as critical thinking, creativity, collaboration, communication, and digital literacy, which are essential for preparing learners to succeed in an interconnected and complex global environment (Mansour, Alharthi, & Alkanhal, 2021). The development and application of these competencies aim to foster learners' adaptability and readiness to navigate the challenges of the 21st century.

21st-century teaching competencies are widely recognized as integral to enhancing learning outcomes in early childhood education. Mansour et al. (2021) emphasize that these competencies not only enhance learners' cognitive abilities but also equip them with the social and emotional skills necessary for holistic development. Bredekamp (2020) further argues that developmentally appropriate practices are critical in the successful integration of 21st-century

competencies, ensuring that teaching methods align with the unique developmental needs of children from birth through age eight.

The integration of 21st-century competencies into ECE&D varies significantly across educational systems. Factors such as teacher preparedness, curriculum design, and access to resources influence the extent to which these competencies are effectively incorporated (National Association for the Education of Young Children [NAEYC], 2020). Additionally, Mansour et al. (2021) highlight the need for adaptive teaching strategies tailored to diverse classroom contexts, emphasizing that a one-size-fits-all approach is insufficient in addressing the unique challenges faced by early childhood educators.

Targeted professional development is crucial in equipping teachers with the skills necessary to implement 21st-century teaching competencies effectively. NAEYC (2020) underscores the importance of continuous professional learning opportunities, including workshops, mentorship programs, and hands-on training, to enhance teachers' capacity to integrate these skills into their practice. Bredekamp (2020) adds that fostering a supportive learning environment for teachers is pivotal in achieving success in 21st century teaching skills.

Teachers' knowledge about 21st century teaching competences and integrating them into day-to-day teaching practices in ECD classrooms is crucial for preparing learners to navigate a complex and interconnected world (Viccko, 2016). Teachers must possess a thorough understanding of 21st-century skills to competently prepare children for the demands of the modern world. Without this knowledge, teachers themselves risk lacking the competence needed to effectively guide children in developing the critical skills required to thrive in today's society. However, variability in implementation across educational systems and a lack of robust professional development remain significant challenges. The National Association for the

Education of Young Children (NAEYC, 2016) emphasizes the need for 21st-century teaching competencies in early childhood education. These competencies include communication, collaboration, creativity, and digital literacy, which are essential for preparing young learners for the demands of the modern economy. Similarly, the Partnership for 21st Century Learning (P21, 2015) highlights the integration of cognitive, social-emotional, and technological skills as critical for fostering learners' adaptability and problem-solving capabilities in an ever-changing world.

Mansour, Alharthi, and Alkanhal (2021) argue that adaptive teaching strategies are fundamental for addressing the diverse learning needs and developmental stages of children in early childhood education. By tailoring instruction to meet individual needs, teachers can enhance learning outcomes and support the holistic development of their students. Adaptive strategies also provide opportunities for differentiated instruction, ensuring that all children, regardless of their abilities, can thrive in their educational environments.

Bredekamp (2020) underscores the significance of developmentally appropriate practices (DAP) in early childhood education. DAP involves creating learning environments and activities that align with children's developmental stages, interests, and cultural contexts. These practices foster a supportive and engaging atmosphere, promoting active learning and skill development in young learners. The integration of 21st-century teaching competencies within DAP frameworks ensures that children receive instruction that is both age-appropriate and future-oriented.

Professional development plays a pivotal role in enhancing teachers' abilities to implement 21st-century teaching competencies effectively. According to Kim, Care, and Vista (2019), professional development programs should provide tools, mentorship, coaching, and hands-on experiences. Such programs enable teachers to master subject content, integrate technology into instruction, and apply innovative teaching strategies. Opportunities for real-world application,

such as internships and case studies, allow teachers to refine their skills and adapt their practices to the evolving demands of the 21st-century economy.

Bett (2016) highlights challenges in teacher training, noting that efforts to balance quality and quantity in education systems have diluted training content. This dilution limits the practical application of theoretical knowledge, hindering the development of high-quality teachers. Strengthening professional development packages with a focus on practical, experiential learning can bridge the gap between theory and practice, fostering teachers' growth and effectiveness.

The rapid changes in economic, social, and technological spheres pose significant challenges for teachers, policymakers and managers. Times Higher Education (2023) emphasizes the need for teachers to master content, integrate technology, and apply 21st-century teaching strategies to promote societal economic well-being and national development. However, insufficient alignment within education systems for teaching and learning these competencies remains a persistent issue.

Developmentally appropriate practices (DAP) are a cornerstone of effective early childhood education. Bredekamp (2020) explains that DAP involves creating learning environments and activities that are tailored to children's developmental stages. By aligning instructional strategies with children's cognitive, social-emotional, and physical needs, teachers can foster optimal learning experiences.

The 21st century demands a multifaceted skill set for both learners and teachers encompassing cognitive, social-emotional and technological skills. These competencies enable teachers to equip learners with the tools needed to thrive in a rapidly changing world. Economic, social, and technological changes have created new challenges for educators, policymakers, and

managers, who must prepare learners with soft skills while delivering quality education (Times Higher Education, 2023).

Teachers play a pivotal role in national development by mastering content, integrating technology into instruction, and applying 21st-century teaching strategies. Professional development is critical to enhancing teachers' competencies and fostering career growth. According to Kim et al. (2019), professional development initiatives should include tools, mentorship, coaching, and hands-on experiences to align education systems with the demands of the 21st century.

This chapter underscores the importance of equipping educators with the skills, strategies, and tools necessary for 21st-century teaching and highlights the need for professional development programs that align with these objectives. To promote societal economic well-being and national development, teachers must master subject content, integrate technology into instruction, and apply 21st-century teaching strategies. Professional development is crucial in enhancing teachers' competencies and fostering their career growth. Kim, Care, and Vista (2019) assert that education systems must align teaching and learning practices with the demands of 21st-century skills. Effective professional development packages should include opportunities for subject-matter mastery under the guidance of experienced mentors, practical exposure through internships, and the application of theoretical concepts in real classroom settings.

Engaging teachers in case studies, scenarios, and best practices allows them to transform their teaching strategies and adapt to the evolving 21st-century economy. Bett (2016) highlights that balancing quality and quantity in teacher training has often resulted in diluted content, limiting the practical application of theory. This dilution impedes the development of quality pedagogical content knowledge (PCK). Watene (2020) emphasizes that teachers' deeper

knowledge and confidence in subject matter are essential for achieving quality learning outcomes and high academic performance. Therefore, sufficient time must be allocated to teacher professional development (TPD) programs to ensure that content is covered in depth, benefiting both teachers and learners.

Deliberately planned programs for early childhood development (ECD) should support teachers in enhancing their content knowledge, utilizing educational technologies, and adopting innovative teaching methods. These programs should also foster the creation of professional development clusters among peer teachers, encouraging collaboration and growth. Professional development is an ongoing process that involves acquiring knowledge, skills, and expertise to enhance professional abilities and achieve career growth (Kim et al., 2019). Activities such as training, coaching, mentoring, and expert support are essential for improving teacher performance and achieving professional goals.

Despite the importance of TPD, many teachers are inadequately prepared to teach effectively. Reimers and Chung (2018) observe that in numerous countries, teachers' basic knowledge is not standardized or measurable, necessitating professional development programs to build teachers' capacity. Furthermore, Hammond, Hylar, and Gardner (2017) note that while some studies have identified key competencies for teachers working with ECD learners, less is known about scaling up the development of 21st-century teaching competencies and building teacher capacity through TPD programs.

The process of equipping teachers with 21st-century competencies is complex and challenging. Reimers and Chung (2018) argue that teacher education systems face significant difficulties in training and developing motivated teachers capable of meeting the demands of modern education. These challenges underscore the need for targeted and well-structured

professional development initiatives that address the unique demands of ECD and prepare teachers to excel in their roles.

In the past two decades, spirited efforts have been made to enhance teachers' preparedness and efficacy in fostering 21st-century teaching competencies through various programs, policies, and reforms (Graham & Scott, 2016). Despite these efforts, challenges persist. Johnson (2018) notes that teachers, particularly those in early childhood development (ECD), often have an emotional attachment to traditional teaching methods and materials, which may make them reluctant to adopt new approaches. Similarly, resistance to change among educators, including the adoption of new technologies, can stem from the perceived effort required to implement these changes and their comfort with familiar resources, even if they are outdated (Ackah, 2016).

Teachers need support to actively engage in ongoing professional development activities, scholarship, and capacity-building initiatives focused on 21st-century teaching competencies. Brusic and Shearer (2014) assert that the alterations, advancements, and global connections of the 21st century have shifted teachers' roles, as they are no longer sole holders of knowledge.

The role of the teacher has evolved to include fostering communities of learners who are self-driven, collaborative, flexible, and committed to lifelong learning (Soule & Warrick, 2015). According to Ejuu (2020), teachers must develop critical thinking, problem-solving, creativity, and collaborative skills to lead learners in the knowledge-based economy of the 21st century. Similarly, Lambart (2016) points out that while the learning landscape has shifted, the teaching landscape often remains rooted in 20th-century pedagogy, creating a gap between teaching practices and modern learners' needs.

Teachers face significant challenges in applying 21st-century teaching competencies. McEwan (2016) observes that when some teachers are assigned strands they struggled with during

their initial training, they may either skip those topics or teach them with limited pedagogical and subject content knowledge due to inadequate preparation. Tumwesigye (2020) further highlights that despite efforts to integrate ICT into the mainstream curriculum, Uganda's education system largely relies on traditional rote learning, with minimal application of concepts and limited access to modern technology platforms. Teachers' attitudes and beliefs about technology play a significant role in the successful integration of ICT into teaching.

To bridge the gap between traditional and modern teaching practices, teachers must move beyond knowledge-based learning to creating opportunities for critical thinking, innovation, collaboration, and self-driven learning (Ejuu, 2020). Such practices are essential for preparing learners to navigate the complexities of the modern world.

The cascade model of teacher training has faced criticism for its insufficient content coverage during teacher professional development (TPD) programs. Bett (2016) argues that efforts to balance quality and quantity in training have diluted content, resulting in minimal transformation of theoretical knowledge into practical application. This limitation hinders the enhancement of 21st-century skills among early childhood development (ECD) teachers and adversely impacts learners' readiness to become global citizens equipped with essential 21st-century skills.

Watene (2020) underscores the importance of teachers possessing deeper knowledge, understanding, and confidence in their subject matter to enhance their 21st-century teaching competencies. However, the time allocated for TPD programs is often insufficient to cover content in depth, limiting the potential for positive impacts on teachers' abilities to transfer 21st-century skills to their learners.

Teachers' attitudes and willingness to adapt play a significant role in the successful integration of 21st-century teaching competencies. Karner and Krull (2016) emphasize that teachers' knowledge and skills are influenced by their positive attitudes towards change and their willingness to take responsibility for adapting to new competencies. Teachers must invest time, energy, and effort to advance the skills, attitudes, and knowledge required for teaching in 21st-century classrooms. Achieving mental comfort, satisfaction, and security through these efforts further motivates teachers to support and implement new innovations.

In the context of ECD, teachers' understanding of child development stages and milestones is critical for tailoring teaching strategies, practices, and activities to meet the specific needs and abilities of young learners. Sigler and Acock (2020) highlight that varying levels of knowledge and understanding among teachers directly affect their ability to create developmentally appropriate learning environments.

This section underscores the challenges inherent in teacher professional development, particularly in the context of ECD. Insufficient content coverage, limited program durations, and the need for positive attitudes toward change are key factors that influence the successful implementation of 21st-century teaching competencies. Tailoring professional development to address these issues is essential for equipping teachers with the skills necessary to prepare learners for the demands of the modern world.

The cascade model of teacher training has also been blamed for providing insufficient content coverage during teacher professional development programs. According to Bett (2016), the attempt to strike a balance between quality and quantity has diluted training content resulting in minimal transformation of theory into practice. Indeed, such practices impede the enhancement of 21st-century skills among the teachers of ECD and cause a setback to the learners to be

equipped with 21st century skills and suit the global citizen. Equally Watene (2020), emphasizes that teachers' deeper knowledge, understanding and confidence in the subject matter are critical in enhancing their 21st century teaching competences but the time allotted for TPD programs are insufficient to cover content in depth to positively impact on the teachers' enhancement of 21st century teaching competences and transferring 21st century skills to the learners.

Karner & Krull (2016), equally advance that teachers' knowledge of 21st century teaching competences is influenced by their possession of a positive attitude towards change accompanied by their willingness to assume responsibility in the adaptation of 21st century teaching competences. Through sacrifice and investing time and energy to advance in skills, attitudes and knowledge required to teach in the 21st century classrooms and gain satisfaction related to mental comfort, pleasure and security to support and carry out the new innovations.

2.2 The 21st Century Teaching Competences Being Applied by Lower Primary Class Teachers to Enhance 21st Century Skills Among Learners in Lower Primary.

Teaching competencies refer to the knowledge, skills, attitudes, and behaviors that teachers possess and demonstrate to facilitate effective teaching, learning, and development. These competencies enable teachers to create engaging learning environments, support children's academic and socio-emotional growth, and foster positive educational outcomes (Popora, 2018). In the context of early childhood development (ECD), 21st-century teaching competencies encompass a range of essential skills and knowledge that prepare teachers to effectively navigate the opportunities and challenges of modern education.

Teachers in lower primary classes play a crucial role in shaping the foundational learning experiences of children aged six to eight years. These years are formative in establishing the groundwork for children's future academic and socio-emotional development. It is imperative for teachers in ECD classrooms to apply a variety of 21st-century teaching competencies to enhance the learning experiences of their learners in an evolving educational landscape (P21 Partnership for 21st Century Learning, 2015).

Effective ECD teachers often employ child-centered teaching approaches, focusing on the interests, strengths, and preferences of individual children. By creating supportive and nurturing environments, they encourage exploration and curiosity among learners (Korhonen & Lavonen, 2016). Play-based teaching methods are a fundamental component of early childhood education, fostering creativity, problem-solving skills, and social interactions. These methods engage children in meaningful and enjoyable learning experiences that contribute to their holistic development (Korhonen & Lavonen, 2016).

Collaborative learning experiences are another hallmark of effective ECD teaching. Teachers design group activities and projects that promote teamwork, cooperation, and communication skills among young learners (Diamantopoulos & Papanis, 2018). These activities provide opportunities for children to develop social and collaborative competencies critical for their future learning and interactions.

Additionally, ECD teachers demonstrate familiarity with inclusive education principles, striving to create classroom environments that cater to children with diverse backgrounds, abilities, and needs (Diamantopoulos & Papanis, 2018). Inclusive practices ensure that all learners feel valued and supported, contributing to equitable and holistic educational outcomes.

The integration of digital literacy and technology into early childhood education (ECD) classrooms has become increasingly significant in fostering 21st-century skills. Plowman and Stephen (2017) highlight that ECD teachers can effectively apply digital tools, such as educational games, virtual manipulatives, and storytelling apps, to facilitate teaching and learning. These tools create interactive and engaging learning experiences tailored for young children. Similarly, Hobbs (2018) emphasizes the potential of digital storytelling to enhance children's literacy skills. He recommends that ECD teachers involve children in creating digital stories through multimedia presentations, digital books, or stop-motion animations, which support creativity and communication skills.

In addition, Barab and Plucker (2017) underscore the value of virtual field trips in enhancing children's learning experiences. Teachers can use virtual reality (VR) and augmented reality (AR) tools to take children on interactive journeys to museums, historical sites, or natural wonders, making learning more dynamic and experiential. Fraillon et al. (2019) stress that digital literacy is a crucial competency for both teachers and learners in the 21st century. ECD teachers

are expected to possess digital skills to integrate technology effectively in the classroom and guide children in using digital tools responsibly.

Despite the recognized benefits of digital literacy in education, significant gaps remain in the implementation of ICT integration in Uganda's teacher training and classroom practices. The Ministry of Education and Sports (MOES) Thematic Report 3 (2018) highlights a shortage of ICT facilities and laboratories in teacher training colleges. This deficit hampers the ICT skills development of both teacher trainees and their tutors, limiting the ability to implement innovative and competence-based teaching approaches such as blended learning. For instance, many Primary Teacher Colleges (PTCs) in Uganda lack the required ICT infrastructure, contradicting the country's strategic direction to mainstream ICT in teaching and learning.

Moreover, broader systemic issues such as the high cost of mobile internet, limited access to phone charging points, and insufficient digital literacy among educators and learners further hinder the effective integration of technology in education. The report calls for policy interventions, including partnerships with mobile networks to provide affordable tariffs and bundle packages for learning purposes.

Halpern (2014), underscores that critical thinking and problem-solving skills are essential teaching competencies. These skills empower learners to analyse information, make reasoned judgments, and solve complex problems. However, these competencies remain underdeveloped among teachers due to limited professional development opportunities and resource constraints.

The gaps identified in ICT integration, digital literacy and critical thinking skills among ECD teachers highlight the need for targeted professional development programs. These programs should address the shortage of ICT facilities, provide affordable access to technology, and offer training to enhance teachers' digital literacy and critical thinking abilities. Without

deliberate efforts to bridge these gaps, the potential of 21st-century teaching competencies to transform ECD classrooms remains unrealized.

Critical thinking and problem-solving skills are essential for navigating the complexities of the 21st-century educational landscape. These skills enable individuals to address uncertainties, think creatively, and make informed decisions. Teacher professional development plays a critical role in fostering these skills among educators, ensuring they can, in turn, nurture learners' intellectual development through effective teaching practices (Gandara & Contreras, 2020). Reflective practice is particularly valuable in this context. Gandara and Contreras (2020) further explain that after engaging in critical thinking and problem-solving activities, teachers evaluate the effectiveness of their strategies, identify areas for improvement, and become more aware of their thinking patterns, ultimately enhancing their teaching practices.

However, gaps remain in the integration of critical thinking and problem-solving skills into teacher training and professional development programs. Many teachers lack structured opportunities for reflective practice and training in metacognitive strategies (Korthagen, F. A. J. 2017). These limitations hinder their ability to effectively foster these skills in learners, highlighting the need for targeted professional development programs that emphasize reflective practices and problem-solving strategies.

Collaboration and teamwork are essential teaching competencies that enable teachers to work effectively with others, share ideas, and achieve common goals. Johnson (2018) asserts that these skills are highly valued in today's interconnected world and are crucial for preparing learners to succeed in diverse professional and social contexts. In the ECD classroom, teachers foster collaborative learning environments by organizing group projects, discussions, and

cooperative activities. These practices enhance teamwork, communication, and the ability to work effectively with others among learners.

Despite the importance of collaboration, there is limited emphasis on these competencies in many teacher training programs. Johnson (2018) observes that ECD teachers often lack structured training on how to design and implement collaborative activities effectively. Additionally, resource constraints and large class sizes in some settings hinder the application of teamwork-based learning, limiting opportunities for learners to develop these critical 21st-century skills.

Effective communication is a fundamental teaching competency that enables educators to convey information, engage learners, and create a positive learning environment. Hammond and Gardner (2017) highlight that communication skills empower teachers to express ideas clearly, listen actively, and adapt their communication styles to meet the needs of diverse learners. In ECD classrooms, teachers promote communication through group work, encourage teamwork, and provide opportunities for learners to express their ideas and actively listen to peers and teachers.

However, gaps in communication skills development persist among teachers. Hammond and Gardner (2017) note that many teachers lack training in adapting communication styles to cater to diverse learner needs. This limitation often results in missed opportunities to foster effective communication skills among young learners. Furthermore, inadequate access to resources and professional development programs leaves teachers ill-equipped to create dynamic and interactive communication-rich environments in their classrooms.

The review of critical thinking, collaboration and communication skills as essential 21st-century teaching competencies highlights significant gaps in teacher training and practice (Eric,

2022). Addressing these gaps requires targeted interventions, including structured professional development programs, resources to support collaborative and reflective practices, and training that equips teachers to adapt their communication styles effectively. Without deliberate efforts to address these gaps, the potential for ECD teachers to prepare learners for the demands of the 21st century remains unrealized. Communication skills are critical teaching competencies for lower primary teachers, as they directly influence the development of learners' communication abilities. Effective communication encourages verbal expression, active listening, and the articulation of thoughts and ideas. Teachers employ strategies such as storytelling, role-playing, and class presentations to enhance learners' communication skills. These methods foster a dynamic learning environment that supports the social and emotional growth of children (Robinson, 2015). Despite the emphasis on these methods, there is often insufficient training for teachers to develop the necessary communication skills themselves, limiting their ability to transfer these competencies effectively to learners.

In addition to communication, fostering creativity and innovation in lower primary learners is a critical aspect of education. Creativity enables learners to express themselves freely, think imaginatively, and explore innovative ideas. Robinson (2015) notes that teachers nurture these skills through open-ended activities, arts-based experiences, and problem-solving opportunities. However, gaps remain in teacher training programs, particularly in equipping teachers with strategies to integrate creativity into everyday classroom activities. Many teachers rely on traditional teaching methods, which may not adequately support creative thinking and problem-solving skills.

Craft (2017), emphasizes that creativity and innovation are essential competencies for addressing complex problems and generating fresh ideas. Nevertheless, many education systems

prioritize standardized testing and rote learning, which can stifle creativity among both teachers and learners. Professional development programs often lack a focus on nurturing creativity and innovation, leaving teachers underprepared to implement these practices effectively. Addressing these gaps requires deliberate policy changes and investments in teacher education programs that emphasize creativity, communication, and innovation.

The incorporation of creativity and innovation in early childhood education (ECD) classrooms is pivotal in inspiring learners to become adaptable, critical thinkers capable of tackling complex challenges in a rapidly evolving world. Teachers who integrate creative activities and encourage imaginative thinking can cultivate learners' problem-solving skills and adaptability. However, gaps persist in equipping teachers with adequate training to implement creative strategies effectively in ECD classrooms. Many teacher training programs lack comprehensive modules on creativity and innovation, leaving educators underprepared to foster these skills in young learners (Craft, 2017).

Another essential 21st-century teaching competency is cultural competence and global awareness. Gay (2018) emphasizes that lower primary teachers can promote cultural competence by incorporating diverse perspectives and experiences into their teaching. This includes using multicultural literature, discussing global issues, and engaging learners in activities that foster empathy and understanding of diverse cultures and communities. Similarly, Nieto (2017) underscores the importance of global awareness as a teaching competency that prepares children to navigate an interconnected world by promoting empathy, respect, and open-mindedness. Despite these insights, there remains a significant gap in teacher preparation programs regarding the inclusion of cultural competence and global awareness. Teachers often lack resources,

training, and support to effectively integrate multicultural and global education into their practices, limiting their ability to foster these competencies in learners.

UNESCO (2015) highlights the critical role of education in promoting global citizenship, cultural understanding, and intercultural dialogue. The report emphasizes the need for teachers to cultivate global awareness and cultural competence as foundational elements for preparing informed global citizens. However, many educational systems still focus on traditional content delivery, neglecting the critical aspect of cultural competence in teacher professional development programs.

Adaptability and resilience are also essential competencies for learners in the 21st century. Teachers play a crucial role in helping learners develop these skills by creating supportive learning environments. Soodak and Podell (2016) note that teachers can design activities that require learners to adapt to changing circumstances, manage challenges, and learn from failures. By providing feedback and encouragement, teachers promote a growth mindset among learners, enabling them to overcome obstacles and navigate life's uncertainties. However, gaps remain in the training and resources provided to teachers to foster resilience and adaptability effectively. Many teachers lack structured programs or strategies to support the development of these skills in learners.

Self-directed learning is another critical teaching competency in the 21st century. Knowles and Swanson (2015), highlight that self-directed learning empowers learners to take ownership of their learning process, set goals, and develop skills for lifelong learning. Despite its importance, self-directed learning is often overlooked in teacher training programs. Teachers require support and training to effectively encourage self-directed learning practices in their classrooms, ensuring learners are prepared for a world that demands continuous learning and

adaptability. Self-directed learning is a critical teaching competence for the 21st century, particularly in early childhood education (ECD). It involves empowering learners to identify their learning needs, seek resources, and engage in independent inquiry. UNESCO (2018) emphasizes the role of self-directed learning in fostering lifelong learning, highlighting the need for teachers to guide learners in setting goals, planning their learning journeys, and monitoring progress. Through self-directed learning, teachers encourage independent thinking and provide opportunities for self-reflection and assessment, cultivating learners' responsibility for their educational growth. This competence is vital in preparing learners to adapt to the demands of a rapidly changing world.

However, gaps persist in the implementation of self-directed learning in ECD classrooms. Teacher training programs often lack structured modules that equip educators with the strategies and tools necessary to effectively promote self-directed learning among young children. Furthermore, the absence of institutional support for reflective practices hinders teachers' ability to adapt their approaches to meet diverse learner needs. Kim (2019) underscores the importance of reflective practice and ongoing professional development in enhancing teaching competencies, suggesting that engaging in self-reflection enables teachers to critically analyze their practices, seek feedback, and implement improvements.

Collaboration networks represent another essential teaching competence for 21st-century educators. Teachers must foster communication, teamwork, and networking skills in learners, enabling them to collaborate with peers, experts, and broader communities to achieve shared goals. Raza (2019) notes the increasing focus on developing competencies for 21st-century skills to improve instructional quality. However, challenges remain, particularly in understanding context-specific teaching practices and finding meaningful ways to support professional

development. These gaps highlight the need for training programs that address the unique challenges teachers face in diverse educational contexts.

Similarly, Wagioko (2022) emphasizes the necessity for teachers to evolve alongside global changes and trends. She critiques the static nature of many classrooms, advocating for teaching approaches that prepare learners for life rather than focusing solely on academic grades. Wagioko stresses the importance of equipping learners with skills beyond listening, encouraging teachers to recognize and nurture the diverse capabilities learners bring into the classroom.

Griffin and Care (2014) advocate for a shift in teacher mindsets toward interdisciplinary approaches to competencies, moving away from discrete content knowledge acquisition. They assert that critical thinking, problem-solving, teamwork, communication, negotiation, analytical skills, creativity, and intercultural awareness are prerequisites for effective 21st-century teaching. Despite the acknowledgment of these competencies, many teacher training programs fail to provide comprehensive training in these areas, leaving educators ill-prepared to meet the demands of modern classrooms.

2.3. Explore Approaches That Can Be Used to Retool Teachers of Lower Primary Classes in Iganga Municipality With 21st Century Teaching Competences.

Retooling teachers refers to the process of updating and enhancing their knowledge, skills, and instructional practices to meet the changing demands of the educational landscape. According to Hammond and Gardner (2017), retooling involves equipping teachers with updated knowledge, skills, and instructional practices that reflect changes in curriculum, technology, and pedagogy. They emphasize the importance of ongoing professional development as a means of ensuring teachers' effectiveness in the classroom. However, while the importance of retooling is acknowledged, there is limited research on the specific strategies for supporting teachers in integrating 21st-century teaching competencies into their practices.

Professional development, as part of retooling, plays a critical role in fostering continuous learning for educators. It encompasses activities such as training, coaching, mentoring, and expert consultation, which aim to enhance teachers' knowledge, skills, and expertise (Hammond & Gardner, 2017). Malala (2017) underscores the need for experienced teachers to undergo continuous professional development to remain updated with new research on how children learn, emerging technologies, and innovative teaching practices. Yet, there is a notable gap in structured approaches that ensure teachers acquire and apply 21st-century teaching competencies effectively, particularly in Early Childhood Development (ECD).

Professional development has been recognized as an agent of change in classroom practices (Malala, 2017). Structured, continuous, and collaborative professional development opportunities can promote pedagogical and professional growth. Malala further asserts that providing regular learning opportunities for teachers helps them remain relevant and equipped with tools and resources required for modern educational environments. Despite these insights,

there is insufficient emphasis on professional development programs explicitly designed to integrate 21st-century teaching skills such as critical thinking, collaboration, creativity, and digital literacy.

The literature suggests that effective retooling for ECD educators requires a deliberate focus on 21st-century competencies. This involves designing professional learning programs that are sustained, structured, and aligned with contemporary educational demands. However, there is a lack of research exploring how these programs can be tailored to the specific needs of ECD teachers. For instance, while Hammond and Gardner (2017) highlight the importance of updating teachers' practices, there is limited exploration of how these updates can address skills like integrating technology into teaching, fostering problem-solving skills, or adapting pedagogy to diverse learning styles in the 21st century.

Although retooling and professional development have been widely studied, significant gaps remain in the literature regarding ways to support teachers in acquiring and applying 21st-century teaching competencies. First, most professional development programs focus on general pedagogical improvements rather than integrating specific skills such as digital literacy, communication, and innovation into classroom practices. Additionally, few studies explore how professional development programs can be contextualized to meet the unique demands of ECD educators, particularly in low-resource settings.

Furthermore, there is limited research on the effectiveness of various professional learning models in fostering 21st-century competencies. Collaborative learning approaches, such as peer coaching and professional learning communities, have been suggested as effective, but their impact on teachers' ability to implement 21st-century teaching strategies remains underexplored (Malala, 2017).

The retooling of teachers, particularly those in Early Childhood Development (ECD), requires professional development programs that deliberately emphasize the integration of technology, critical thinking, collaboration, and creativity. These competencies are essential for enhancing teaching practices and ensuring educators remain current with the latest research and best practices in education (Ackah, 2020). However, while the need for these programs is widely recognized, there remains a gap in how they can be structured to systematically address the specific demands of 21st-century education.

Ackah (2020) highlights that effective professional development for ECD teachers must be continuous, practical, and collaborative, rooted in understanding learners' cultures and experiences. This perspective underscores the importance of developing systems that assist teachers in their professional learning and teaching practice improvement. These systems include administrator support for professional learning, collaborative learning circles, and job-embedded feedback cycles. Despite these recommendations, limited research explores how these systems can be tailored to support the unique needs of ECD teachers, particularly in integrating 21st-century skills into their practices.

One proposed model for retooling teachers is the reflective practice model, which emphasizes self-reflection and critical analysis of professional experiences. Wong (2019) argues that reflective practices enable teachers to adapt and improve their practices in real-time and through post-lesson analysis. This approach encourages educators to examine their beliefs, assumptions, and practices to identify areas for improvement. Reflective practices involve seeking feedback from peers or mentors, setting goals, and implementing strategies for enhanced performance. While reflective practices promote continuous learning and informed decision-making, there is a lack of research on how these practices can be systematically integrated into

professional development programs to specifically target 21st-century skill development for ECD teachers.

Collaborative professional learning communities provide a platform for ECD teachers to share ideas and experiences while fostering a supportive network focused on skill development (Wang & Wu, 2018). These communities can facilitate the exchange of best practices and create an environment for mutual learning. However, gaps remain in understanding the specific structures and strategies that make these communities effective for 21st-century skill acquisition, such as integrating technology or fostering innovation.

Francesca and Caena (2019) suggest that innovative teaching strategies, such as project-based learning, inquiry-based learning, and problem-solving approaches, are effective ways to foster critical thinking and creativity among teachers. These strategies provide opportunities for teachers to engage in hands-on, experiential learning, which can be transferred to classroom practices. However, there is limited evidence on the effectiveness of these strategies in low-resource contexts or their adaptability to diverse educational settings, particularly in ECD.

Kim (2019) highlights mentorship and coaching as another critical strategy for retooling teachers. In this model, an experienced mentor guides a less experienced teacher, offering advice on teaching practices, personal development, and career advancement. While mentorship programs have shown promise in supporting teacher development, more research is needed to explore how these programs can be specifically designed to address 21st-century teaching competencies, particularly in contexts where experienced mentors may themselves lack training in these skills.

While the literature provides insights into various approaches for retooling teachers, several gaps remain. First, there is limited research on how professional development systems can

be specifically designed to support the integration of 21st-century skills into teaching practices. Additionally, the effectiveness of reflective practices, collaborative learning communities, and mentorship programs in fostering these competencies requires further exploration. Finally, there is insufficient focus on how innovative teaching strategies can be adapted to diverse educational contexts, especially in low-resource settings.

Schleicher (2019) highlights the importance of communities of practice as collaborative learning models where teachers with similar interests, experiences, or goals come together to share knowledge, experiences, and best practices. These communities provide a supportive environment for ECD teachers to engage in dialogue, exchange ideas, and collectively develop their expertise. They can take various forms, including professional associations, online forums, or workplace learning teams. While this model fosters social learning and promotes the sharing of best practices, there is a lack of empirical evidence on how such communities can be optimized to specifically enhance 21st-century teaching skills like creativity, collaboration, and critical thinking.

The job-embedded professional development model aligns professional learning activities with workplace contexts and the specific goals of the school or profession. Ackah (2020) asserts that this approach bridges the gap between theory and practice by integrating hands-on learning, real-world problem-solving, and immediate application of new knowledge and skills into teaching practice. Common elements of this model include coaching, mentoring, action research, and collaborative projects that directly relate to teaching responsibilities. Despite its relevance and potential for sustainable change, gaps remain in understanding the most effective strategies for tailoring this model to the unique needs of ECD teachers, particularly in resource-constrained environments.

Originating in Japan, the lesson study model is a collaborative professional development approach that involves teachers working together to plan, observe, and analyze lessons. Reimers and Chung (2018) note that this cyclical process focuses on improving instructional quality through planning, teaching, observing, and reflecting. The model enhances teachers' content knowledge, pedagogical skills, and learners' achievements. However, there is limited research on how lesson study can be adapted to the specific challenges of ECD teaching, including addressing diverse learner needs and integrating technology into early learning environments.

Providing access to expert support is another valuable approach for retooling ECD teachers. Blazar and Hogan (2018) argue that workshops, seminars, online forums, and mentoring programs delivered by subject matter experts, researchers, or experienced educators can help teachers deepen their content knowledge, refine instructional techniques, and address specific challenges in teaching practices. While expert support has been shown to positively impact instructional practices, learning outcomes, and job satisfaction, there is insufficient exploration of how such support can be sustained and integrated into the professional development ecosystem for ECD teachers.

Although various approaches to retooling teachers for 21st-century competencies have been explored, several gaps remain. First, there is a lack of research on how coaching and mentoring can be adapted to meet the specific demands of ECD education, particularly in integrating critical 21st-century skills like digital literacy and creativity. Second, while communities of practice are widely regarded as effective for collaborative learning, little is known about how these communities can be structured to address the unique challenges of ECD teachers. Additionally, job-embedded professional development and lesson study models require further investigation to determine their applicability and scalability in diverse educational settings,

especially in under-resourced contexts. Lastly, the sustainability of expert support programs and their long-term impact on teacher effectiveness in fostering 21st-century skills remains underexplored. The integration of technology in Early Childhood Development (ECD) classrooms is increasingly recognized as a critical component of professional development for teachers. Alvarado and Taylor (2016) argue that technology enhances instructional practices, engages children in meaningful learning experiences, and enables teachers to keep pace with the evolving educational landscape. Specific strategies, such as leveraging mobile phone educational applications and open-source software platforms, have been identified as viable solutions to address challenges and meet the educational needs of teachers and learners (Tumwesigye, 2019). However, while these approaches are promising, they must be implemented in a context-specific manner to consider the unique needs, experiences, and challenges faced by teachers in lower primary classes. Despite this recognition, there is limited research on how technology integration can be effectively tailored to the diverse realities of ECD teachers, particularly in resource-constrained environments.

Action research is a methodology that allows teachers to engage in systematic, self-reflective inquiry to improve their teaching practices and enhance children's learning outcomes. This approach is particularly valuable for equipping ECD teachers with the necessary competencies for effective 21st-century teaching (Sullivan & MacPhail, 2016). Action research empowers teachers by involving them in a process of inquiry-based learning, enabling them to take ownership of their professional development and adapt instructional strategies to meet the evolving needs of young learners.

The collaborative and iterative nature of action research aligns with adult learning principles, encouraging teachers to draw on prior experiences and knowledge to inform their

research and instructional decision-making (Sullivan & MacPhail, 2016). By engaging in this process, ECD teachers can identify areas for improvement, explore innovative teaching methods, integrate technology, foster creativity and critical thinking, and create a more learner-centered environment. Despite its potential, Ackah (2020) highlights significant gaps in the preparedness of teachers to use action research as a tool for addressing challenges in modern classrooms. Many teachers lack the training and exposure needed to effectively engage in action research methodologies, leaving them ill-equipped to respond to the demands of 21st-century education.

While the benefits of integrating technology and action research into ECD professional development are well-documented, several gaps remain. First, there is a lack of empirical studies on how technology-based strategies can be adapted to the specific contexts and challenges of ECD classrooms. Research is needed to explore how technology integration can address diverse learning needs while remaining accessible to teachers in low-resource settings. Second, although action research has been shown to foster professional growth and classroom innovation, many teacher preparation programs fail to adequately train educators in its methodologies. This gap leaves teachers underprepared to use action research as a tool for solving classroom challenges and promoting continuous improvement.

Countries in Africa, including Uganda, face significant challenges in providing Early Childhood Development (ECD) teachers with the guidance and support needed within the constraints of limited financial resources (Ejuu, 2012). Although Uganda's Primary Teacher Education (PTE) curriculum recommends generic teaching methods that incorporate 21st-century skills, these methods are not sufficiently covered to build a solid foundation for teachers to enhance their teaching competences and transfer these skills to their learners. Ngware et al. (2015) highlight the lack of an established culture of mentorship and coaching in Ugandan schools, which

could otherwise support novice teachers in acquiring professional knowledge, skills, values, and love for the profession. This gap inhibits the enhancement of teachers' 21st-century teaching competences.

Thematic curriculum implementation in Uganda has also faced significant issues. Mabonga (2021) observes that the thematic curriculum is overcrowded with unassessed strands, contrary to its design. In practice, the curriculum content often focuses narrowly on the cognitive domain while neglecting essential areas such as creative arts and physical education. Mabonga attributes this neglect to the emphasis on national examinations, which drives schools to prioritize pass rates over holistic knowledge and skill acquisition. Schools often use assessment results as a marketing tool rather than as formative tools for teaching and learning, which undermines the development of critical 21st-century skills among learners.

Mukunja (2016) identifies a disconnection in the thematic curriculum between the language of instruction and the language of evaluation. While local languages are used for instruction at the lower primary level, English is used for evaluation. This inconsistency can result in unjust assessments and negatively impact learners' ability to demonstrate their knowledge effectively. Atuhurra and Alinda (2017) further emphasize the issue of overcrowded classrooms, which are often too large for a single teacher to manage effectively. This overcrowding contributes to teacher burnout and limits the implementation of educational reforms, including the enhancement of teachers' 21st-century skills. Teachers may also lack the talent, interest, or capacity to teach all thematic areas, further compromising the quality of education and skill development.

Mabonga (2021) also highlights reduced curriculum acceptability and the presence of misconceptions regarding the thematic curriculum. Many implementers lack a sense of

ownership, which limits the successful execution of the curriculum's objectives. This resistance to reform contributes to inconsistencies in achieving the intended outcomes, particularly the enhancement of 21st-century skills.

While there is acknowledgment of the challenges facing ECD teachers in Uganda, several gaps remain in the literature. First, there is insufficient exploration of how financial constraints can be addressed to ensure sustainable support for ECD teachers.

Second, the lack of mentorship and coaching systems in schools has not been adequately studied to provide clear strategies for implementation. Third, there is limited research on how to balance the demands of national examinations with the need for holistic learning and skill acquisition, particularly in fostering creativity, critical thinking, and physical education. Lastly, the contradictions within the thematic curriculum, such as the disparity between the language of instruction and evaluation, require further investigation to determine effective solutions that ensure equitable and just assessment practices.

The professional development and retooling of Early Childhood Development (ECD) teachers in Uganda face significant challenges. Ssentanda et al. (2019) argue that although the National Curriculum Development Center (NCDC) asserts that the primary school curriculum development process is consultative, it is, in practice, highly centralized and top-down. This approach has resulted in reduced curriculum acceptability and misconceptions among stakeholders, who feel inadequately consulted. Consequently, curriculum implementers do not carry out its implementation as intended, which compromises the achievement of its objectives.

Mabonga (2021) highlights inadequacies in continuous professional development (CPD) programs for ECD teachers. He notes a decline in funding to support teachers in implementing the curriculum. Many teachers lack the skills to interpret the curriculum and instead rely on past

examination papers for instruction, driven by an examination-oriented education system. Furthermore, most CPD programs are conducted outside schools or during holidays, failing to address the personal and contextual challenges teachers face in their schools due to 21st-century demands. This limits the effectiveness of CPD programs in enhancing teaching competences.

Access to technology remains a significant challenge in Uganda, particularly in rural areas. Tumwesigye (2020) argues that for most learners in rural areas, online learning remains an unattainable goal. Limited access to basic necessities makes education a low priority. Uganda's current technology infrastructure is insufficient, and electronic solutions remain inaccessible to most teachers. Busingye (2019) identifies barriers such as inadequate infrastructure, high access costs, unreliable internet and electricity, weak policies, and limited access to appropriate software and online resources. Additionally, a lack of skilled personnel and limited bandwidth exacerbate these issues, restricting the integration of technology into teaching and learning.

The gap in clinical training and professional supervision for ECD teachers is also significant. Wamukote (2016) notes the absence of clinical work, intensive supervision, expert modeling of practices, and peer learning among novice teachers. Addressing these gaps would require a radical overhaul of the status quo. Abbot (2015) highlights the importance of clinical schools, where beginning teachers can work with senior teachers as mentors and co-researchers. However, such schools are lacking, forcing teachers to rely on their own efforts to bridge theoretical knowledge and practical application.

Kagoda (2018) emphasizes that the two-year training period for pre-service teachers is inadequate for covering the loaded Primary Teacher Education (PTE) curriculum. This affects teachers' preparedness and leaves them lacking critical 21st-century teaching competences. Kagoda also points out a misalignment between the PTE curriculum, which is subject-based, and

the primary school curriculum, which is thematically arranged. This inconsistency undermines the practical application of teaching skills in lower primary schools.

Blimpo and Pugatch (2017) note that many teachers in rural and disadvantaged areas lack opportunities for professional training before entering the workforce. Sun et al. (2015) echo this concern, arguing that training opportunities for ECD teachers are rare and that intensive short-term training programs require carefully selected content to maximize their effectiveness. Without equitable access to professional development, teachers in remote areas are left ill-equipped to handle the demands of 21st-century classrooms.

Behuria and Goodfellow (2019) highlight the lack of collaboration among teachers and stakeholders in the education system. Despite the expectation that teachers work together to internalize the demands of 21st-century education, many operate as individuals, focusing on attaining examination scores. This creates a disconnect between theoretical goals and practical application.

2.4 Conclusion

The challenges facing ECD teachers in Uganda highlight the need for deliberate efforts to address gaps in curriculum implementation, mentorship, and professional support systems. Overcoming these barriers will require targeted reforms, including the establishment of mentorship programs, improved teacher training on 21st-century skills, and a reevaluation of curriculum and assessment practices. These measures are critical to equipping teachers with the competencies needed to meet the demands of 21st-century education and to provide learners with a well-rounded and meaningful educational experience

2.5 Summary

This chapter discussed and analysed literature on teacher preparation and 21st century teaching competences. It pointed out the teacher preparation, 21st century teaching competences, and how teachers are affected in adopting these 21st century teaching competences.

Chapter Three

Methodology

3.0 Introduction

This chapter describes the research methodology approach, design, study area, study population, sample size and sampling technique used during data collection, methods of data collection, data processing, data analysis, rigor, trustworthiness, and ethical considerations made during the research process.

Research approach

A research approach refers to the systematic and logical plan or strategy employed by the researcher to investigate and answer specific research questions or objectives. It provides a roadmap for the researcher to follow ensuring that the study is well-organized, rigorous, and capable of producing reliable and valid results (Creswell, 2021).

For this study, a qualitative approach was applied because it is a procedural approach used to explore in-depth complex phenomena from the participants' own viewpoints in a holistic manner. This approach was selected and used to gain a deeper understanding and develop insights from teachers of lower primary classes of schools in Iganga Municipality about how they perceive and engage in applying 21st century teaching competences in their day today classroom practices.

3.1 Research Design

According to Aurini et al. (2016), a research design is a framework or 'blueprint' that describes the steps the researcher used in gathering data to address the research questions. For the researcher to gain a deeper understanding of teachers' preparedness and the attainment of twenty-first century teaching competencies among teachers of lower primary classes in Iganga Municipality, a case study design was used. The case study was the best option because it enabled

the exploration of contextual factors that influence the participants' knowledge and practices, providing valuable insights into their lived experiences in their natural setting.

3.2 Study Area

The study area in research refers to the specific geographical or spatial location where a research study is conducted or where the data collection and analysis take place. It defines the physical boundaries within which the research is focused and provides context for understanding how the research findings relate to a particular region, environment, community, or setting.

This study was conducted in Iganga Municipality, which is in the center of Iganga District, situated in Eastern Uganda. The study was purposively carried out in the Municipality because it is strategically positioned with many social benefits in the schools such as infrastructure, easy transport and access to the schools, presence of utilities like water, electricity, sewage, and communication networks including internet, mobile networks which are major contributors to 21st century skills.

The researcher also held a hypothesis that most developments and innovations start at the district headquarters because it hosts all the administrative units in the district including development organizations, local government structures, political representation, governance mechanisms, decisions and policies making it the ideal space where 21st century skills start from before cascading to the rest of the sub-counties. It is expected that technological innovations or digital transformations have influenced the urban area's development with smart city initiatives or technology hubs that have influenced the development of the education system due to ongoing or planned urban development projects, infrastructure improvements, and policies that shape the area's future.

3.3 Study Population

The study population in research refers to the entire group of individuals, elements, or units that share common characteristics from which the researcher draws a sample or gathers data to make inferences about a larger population (Alex & Caren, 2019). The researcher purposively selected five primary schools within Iganga Municipality to represent a diverse range of school settings, including government aided schools, private, and community-based schools. These schools were selected based on factors such as inclusion and exclusion criteria where the selected schools are anticipated to be including components of 21st century teaching competences in their classroom practices.

Other considerations included demographic characteristics, Children's enrollment, location (urban or rural), and variations in available resources and facilities. Additionally, the schools are in the urban setting where modern changes are taken up extremely fast. Outstandingly the schools are near the core teacher training institution with a resident coordinating center tutor who is responsible for updating the teachers in these schools from time to time with the new innovations in education.

The study population comprised of teachers who are currently employed and actively teaching in lower primary classes. These teachers completed their initial teacher training and are currently teaching lower primary classes which typically comprise pupils between the ages of six to eight years. These learners are in their formative years, a critical stage in education where foundational skills are developed by the children laying the foundation for their future learning and personal development as well as acquisition of 21st century skills which were the focus of this study.

Head teachers also participated in this study because they are crucial stakeholders in the administration and management of the schools and have a comprehensive understanding of the

education system. Their perspectives, insights, and influence on school policies and practices provided valuable information to inform targeted interventions and policy recommendations to support the enhancement of 21st century teaching competences among teachers in Iganga Municipality.

3.4 Sampling Technique and Sample Size

Shantikumar (2018) defines sampling techniques as ways used by researchers to select individuals or elements from the study population to form the sample size.

For this study, purposive sampling was employed to select 15 participants from whom data was collected. Purposive sampling was specifically selected by the researcher because she deliberately focused on specific characteristics and phenomenon within the population. This technique allowed the researchers to target participants who possess the desired attributes of relevance to the collected data. The participants included 5 head teachers and 10 teachers of lower primary classes specifically teaching P.1 and P.3 classes because P.1 is a transition class for children either from home to the primary school or from nursery to the primary school while P.3 is a meditative class ending lower primary.

3.5.1 Head teachers

The head teachers were selected because they are the instructional supervisors in their schools. They are responsible for spear heading government policies and innovations within their schools hence they were key informants during the data collection since they are responsible for mobilizing teachers for CPDs and providing for teachers and learners relevant materials needed for teaching in the 21st century economy.

3.5.2 Teachers

As recommended by Foley (2018), purposive sampling was adopted in this study to select the class teachers of lower primary classes from (P.1 and P.3). From the five schools two teachers were selected from each school, making a total of ten teachers who participated in this study. The teachers selected provided empirical data on their experiences, feelings, and emotions on the enhancement of 21st century teaching competences in their classroom practices.

Table 3.1: Summary of the population of participants from five (5) primary schools in Iganga Municipality

S/N	Particular	Per school	Total
1.	Head teacher	1	5
2.	Classroom teachers	2	10
3.	Total no of participants		15

Source: Primary data

3.6 Research Methods.

Quan-Hoang (2018) explains that a research method is a systematic and structured approach used by researchers to collect, analyze, and interpret data to answer specific research questions, test hypotheses, or achieve the stated research objectives. The tools used in data collection determine the methods to be used for gathering data on targeted variables, to answer the research questions and evaluate outcomes.

As recommended by Creswell (2018), the researcher employed semi-structured interviews in this study to gather qualitative data. The semi-structured interviews enabled the researcher to apply flexible and open-ended sets of questions, allowing for a mix of planned and spontaneous discussions. This approach provided a balance between standardized questions and the opportunity for participants to elaborate on their responses and share insights in their own words. To supplement, the researcher also applied observation method to gain a rich contextual understanding of participant's practices and attitudes in their natural settings and gained a deep understanding of their behaviors, actions and interactions about their knowledge and understanding of 21st century teaching competences. Observation enabled the researcher to interpret the meaning behind participants' behaviors and interactions and generated understanding on the ability to utilize critical elements of 21st century teaching competences for professional development and practice among class teachers of lower primary classes. Focus group discussions structured around key themes were also conducted for school administrators and their teachers to share collective experiences, challenges and best practices regarding 21st century teaching competences and professional development in their classrooms.

3.6.1 Semi-Structured Interviews

A research interview involves an interviewer, who coordinates the process of the conversation and asks questions, and an interviewee, who responds to those questions (Roulston et al., 2018). The interview guides developed for the one-on-one semi-structured interview was used to gather information from the head teachers and class teachers who were interviewed independently using the same interview guide. The researcher used semi-structured interviews because they provided the opportunity to explore the experiences, perceptions, and insights from the participants in a flexible manner. They enabled collecting of first-hand information from the respondents and allowed probing for clarification from the respondents and sought additional information that could have been left out in the interview guide but is related to teachers' preparedness and the enhancement of 21st century teaching competences in lower primary classes of schools in Iganga municipality (Gray et al., 2020; Dempsey et al., 2016). During the interviews, the responses were recorded to avoid missing out other viable information that has been given by the participants as well as promoting accuracy when reporting the findings of the study as pointed by (Bryman, 2012).

3.6.2 Observation

The observation approach is a method for gathering data that offers in-depth knowledge about the subject of research (Moen & Middleton, 2015). Using an observation checklist, the researcher watched the teachers as they conducted lessons in their classrooms to identify the aspects of 21st century teaching competences the teachers are incorporating in their classroom practices. Observations allowed the researcher to gather rich, contextual, and detailed data about participants' practices, interactions, and the teaching environments by observing each teacher

teaching at least one lesson of their choice to triangulate and verify the linkages between the data provided during the interviews and the actual practices being implemented in the classrooms.

3.6.3 Focus Group Discussions

Focus group discussions (FGDs) are qualitative research methods that involve facilitated group discussions to elicit participants' perspectives. This method leverages group dynamics to encourage communication among participants, making it particularly useful for brainstorming ideas and understanding the reasons behind differing opinions.

To gain a deeper understanding of the practices, strategies and institutional barriers related to application of 21st century teaching competences, focus group discussions (FGDs) were conducted with headteachers together with the teachers. The FGDs provided a platform for school administrators and their teachers to share collective experiences, challenges and best practices regarding 21st century teaching competences and professional development in their classrooms. The focus group discussions were structured around key themes.

The discussions were audio-recorded with participants' consent and later transcribed for thematic analysis.

3.9 Data Collection Procedure

The researcher followed authentic steps to enable successful access and compilation of the necessary data from the right respondents and this was done by first acquiring an introduction letter from Kyambogo University which was taken to Iganga district education office to seek permission to carry out this study. On attainment of permission, the researcher prepared and conducted pilot interviews with teachers teaching lower primary classes in Bulamagi sub-county to test the validity of the tools and then she refined the tools based on the feedback she received from the pilot test. The researcher went to the selected schools to seek permission from the head

teachers and teachers and scheduled dates for the interviews and classroom observations. During the process, the researcher explained to the participants the purpose, nature of the study and ethical considerations like confidentiality, anonymity and beneficence expected from the study findings, and then she requested them to voluntarily sign the consent form to participate in the study. The researcher went ahead to schedule the interviews for each respondent at the time of their convenience.

For each interview, the researcher began by building rapport and explaining the purpose of the study and encouraged the participants to speak freely and express their thoughts. Then the researcher followed the interview guide but allowed for flexibility and exploration of innovative ideas from the respondents. The researcher listened actively during the process and asked probing questions by providing non-verbal cues to show engagement.

The researcher recorded the interviews (with participants' consent) using an audio recorder and took written notes in an anecdotal form as a backup for the voice recordings and later transcribed the qualitative data collected. In addition, the researcher directly conducted lesson observation of at least one lesson for each teacher and recorded the findings as recommended by Merriam and Tisdell (2016).

3.10 Data Processing and Analysis

Mayer (2015) explains that analysis of qualitative data requires the researcher to develop patterns in which data is organized for clear conceptual understanding of the findings. Flick (2014) also advances that thematic analysis remains a central theme around which the researcher's findings are organized. In this study, Thematic analysis was used to analyze the qualitative data collected from interviews, focus group discussions and observations. Common themes and patterns were identified to provide insights into the strategies, practices, opportunities and barriers

to the integration of 21st century teaching competences in lower primary classrooms of schools in Iganga Municipality.

The researcher engaged in the process of thematic analysis, identifying patterns, codes and themes in the data and organized the codes into categories and themes to derive meaning. The collected data were analyzed using the method of qualitative thematic data analysis which allowed the researcher to explore the data collected from the oral interviews and lesson observations in-depth and identify patterns, themes and trends within the rich and detailed information collected.

The researcher started by thoroughly reading and becoming familiar with the data which included the recorded interviews, field notes and lesson observations from individual respondents to analyze, comprehend and derive meaning from their perspectives.

She proceeded to generate codes, which are short labels or tags that capture specific aspects of the data by breaking down the data into meaningful units, such as phrases or sentences and assigning codes to these units that reflect the meaning.

The researcher continued to search for patterns and themes within the coded data in broader thematic areas to capture recurring ideas, concepts and experiences that are relevant to the research questions and compared codes and data segments to identify similarities and differences.

The researcher further organized the identified themes into coherent structures by grouping related themes together considering the relationships between them and triangulated findings from the interviews and classroom observations to verify their correctness

Finally, the researcher drafted a narrative report that communicates the findings of the study with detailed descriptions of each theme, supported by relevant quotes from the data.

To ensure rigor and credibility of the analysis, the researcher engaged in the processes of peer debriefing and member checking maintaining an audit trail (documenting decisions and processes).

3.11 Data Rigor and Trustworthiness

To ensure conformability of the findings, the tools including the interview and observation guides were piloted on Head teachers and teachers in Bulamagi a nearby sub- County who were not necessarily part of the study with the intention of testing the consistency or reliability of the study tools to avoid ambiguity. The questions that were not clearly interpreted during the pilot interview were refined to reflect the ideas required in the specific objectives of the research as recommended by Merriam and Tisdell (2016).

The researcher paid remarkably close attention to the data right from the time of collection, storage, and transcription to ensure confidentiality in the study. Likewise, the researcher made very close reference to the information from interviews and observations for corroboration to ensure the trustworthiness and rigor of the study findings following a recommendation from Heale and Forbes (2013), who states that the use of two or more measures to confirm a finding will increase confidence in the rigor and trustworthiness of a qualitative research.

As the researcher interviewed each teacher, she constantly made comparisons to the study's theoretical background which was guided by David Kolb's theory of experiential learning and analyzed how the theory of experiential learning was being applied by teachers of lower primary classes in Iganga municipality during the teaching and learning situation to enhance their 21st century teaching competences.

Additionally, the researcher recorded interviews and observations using a smartphone to support findings during transcriptions and she requested a peer bade to preview the data and validate the findings.

3.11 Ethical Considerations

Study of the human subject requires the researcher to take precautionary measures to ensure that participants and the researcher are protected and safeguarded (Creswell, 2014). In this study, the researcher sought for clearance from Kyambogo University before proceeding to the field for data collection. The introductory letter from Kyambogo University was used to obtain permission from the District Education Officer (DEO) who made phone calls to the respective head teachers asking them to support the researcher to undertake the research studies in their schools and requested them to mobilize the teachers to actively participate.

As recommended by Merriam and Tisdell (2016), the qualitative study required the researcher to establish a trusting relationship with each participant to obtain accurate and reliable information and protect the confidentiality and anonymity of the participants throughout the study. For this qualitative case study, the researcher took all the necessary steps required by the international research board to protect participants' physical, psychological, and emotional health. All selected participants were above 18 years of age, and they first signed a consent form before data collection. The consent forms stated the purpose of the study, procedures, voluntary nature of the study, risks, and benefits of participating in the study. Additionally, the participants were informed that they were free to discontinue participation at any time and that their schools and any identifying factors were going to be kept confidential.

3.12 Summary of chapter three

This chapter has presented an in-depth explanation of the methodology undertaken in the study. This study presented a qualitative case study design that focused on "Teachers' preparedness towards implementation of twenty-first century teaching competences in lower primary classes of schools in Iganga Municipality." The research approach used was qualitative, allowing for an in-depth exploration of the experiences and perspectives of teachers in relation to the enhancement of twenty-first-century teaching competences. The study population consisted of ten (10) teachers currently teaching lower primary classes and five (5) head teachers in primary schools within Iganga Municipality who were selected using purposive sampling.

The data collection methods included classroom observations, interviews with teachers and focus group discussions with headteachers together with the teachers. The observations provided direct insights into the teaching practices and integration of 21st century teaching competences in lower primary classes and the interviews offered a deeper understanding of teachers' knowledge, experiences and challenges related to teaching competences.

Data analysis was done using a qualitative thematic approach, identifying patterns, themes, and trends within the data collected which enabled the study to gain comprehensive insights into the preparedness of teachers of lower primary classes in Iganga Municipality to enhance their 21st century teaching competences.

Chapter Four

Presentation and Analysis of results

4.0 Introduction

This chapter presents the findings of the study, which investigated teachers' preparedness and the enhancement of twenty-first-century teaching competencies in selected lower primary classes in schools in Iganga Municipality. The results are presented according to the study objectives.

4.1 Teachers' Knowledge of 21st-Century Teaching Competences

4.1.1 Teachers' knowledge, attitudes, and skills regarding 21st-century competencies.

Theme: Collaboration and Teamwork

Interview Findings:

Teachers' responses indicate that they are knowledgeable about collaborative learning for their learners and their own collaboration with other peers.

Respondent 1 reported that;

“Having been in the profession for an extended period, I have been able to attend several workshops organized by RTI, EGR and STIR education that have taught me several skills of handling children in my classrooms like collaborative teaching, among others. I have been able to apply these skills in the classroom which has enabled me to improve my teaching abilities, and the children have learnt how to read and write...”

Respondent 2 argued that;

"In my lessons, I make sure to incorporate group discussions at least once a week. For example, when we read a story, I divide the class into small groups and ask each group to discuss various parts such as the characters, setting or plot. Afterward, the groups share their findings with the class and this has enabled the children to learn from one another..."

Respondent 4

"I always encourage teamwork in my classroom. I carefully form groups to mix learners with different abilities and establish clear rules and expectations for the group work, such as active participation and respectful communication. If conflicts arise, I guide them in resolving the issues amicably..."

Respondent 6 reported that;

"Yes, we have had trainings on the 21st century teaching competences and these trainings were facilitated by EGR and STIR where they taught our staff how to use collaborative learning and play based learning for lower primary teachers..."

Respondent 8 argues that:

"I understand that collaboration is important, but it's hard to find time to meet with colleagues to plan lessons or share ideas. Everyone is busy with their own work..."

Respondent 10 highlights that:

"Sometimes, I want to collaborate, but we don't have clear guidance on how to do it effectively. I don't know where to start from!..."

Observation Findings:

During observations, group activities were rarely implemented and were not clearly structured. Learners often disengaged or worked independently despite being in groups, indicating lack of team spirit and proper facilitation by the teachers.

Analysis:

The findings indicate that the teachers are knowledgeable about collaboration and teamwork. However, there arises a gap between teachers' understanding of collaborative teaching and their ability to implement it effectively in their classroom activities. Teachers demonstrated limited ability to foster collaboration, as group tasks lacked defined roles or objectives, leading to uneven participation and missed opportunities for teamwork development."

Head Teachers' Perspectives on Teachers' Collaboration and Teamwork

From the focused group discussions with head teachers regarding the collaborative practices and teamwork capabilities of teachers of lower primary.

The data reveals a significant concern among head teachers that teachers lack the skills strategies and mindset required for effective collaboration and teamwork.

For instance, respondent 11 argues that:

"Teachers talk about collaboration during meetings, but in reality, they work independently in their classrooms. I rarely see joint lesson planning or shared problem-solving among these teachers..."

Respondent 12 highlights that:

"We have encouraged the teachers to form teams for projects, but there is resistance. Some of them prefer to stick to their own methods rather than planning with their peers..."

Respondent 13 states that:

"Some teachers resist collaboration because they feel it challenges their autonomy. They think teamwork will reduce their control over their classrooms..."

Respondent 15 argues that:

"There's also an issue of trust teachers don't always feel comfortable sharing their ideas openly with colleagues..."

Analysis:

Head teachers perceive a disconnect between teachers' awareness of the value of collaboration, willingness and ability to practice it. They argue that resistance to collaboration arises from cultural and personal barriers, including preference for autonomy, fear of conflict and lack of trust among peers.

4.1.2 Theme: Critical thinking and problem solving

In a bid to find out whether the teachers in lower primary had knowledge about incorporating critical thinking and problem-solving skills during teaching as a 21st century teaching competence, the responses gathered were as presented;

Respondent 1 said;

"I incorporate open-ended questions in my lessons to encourage critical thinking. It is teaching children to think independently, analyze situations and not to just accept information without questioning it..."

Respondent 2 insinuates that;

"I usually ask the children to compare and contrast various viewpoints on a topic before forming their own opinion..."

Respondent 3 argued that;

"I regularly ask my children open-ended questions to help them think critically..."

Respondent 6 states that;

"I give group assignments where learners solve problems together, which I believe helps them develop problem-solving skills..."

Respondent 7 says;

"Critical thinking is important, but sometimes I have to focus on completing the syllabus, which doesn't leave much room for problem-solving activities..."

Respondent 8 says;

"We don't have enough time in the school routine to include problem-solving activities, especially with large class sizes you see..."

Respondent 9 says;

"Resources like teaching aids or access to technology to support critical thinking are very limited in our school..."

Observation:

Teachers applied rote method most of the time and used closed-ended questions, leaving little room for learners to engage in critical thinking.

Problem-solving activities were either absent or overly guided, hindering learners from exploring independent solutions.

Head Teachers' perspectives on teachers 'application of critical thinking and problem solving

Respondent 11 states that;

"Teachers often claim they are incorporating critical thinking, but they normally apply rote learning in their lessons..."

Respondent 12 says;

"I rarely see activities in the classroom where children are encouraged to think critically or solve real-world problems. It is mostly about preparing them for exams..."

Respondent 14 states that;

"Most of our teachers use teacher-centered methods compared to learner centered methods so the children have little opportunity to engage in activities that develop critical thinking..."

Analysis:

Critical thinking and problem-solving were minimally supported, as instruction often emphasized factual recall rather than encouraging analysis, evaluation, or creative solutions.

Teachers mainly applied traditional, teacher-centered methods of teaching sighting pressures of curriculum demands and exam preparation. This limited the integration of critical thinking and problem-solving, which require time for exploration and active learner engagement.

Theme: Collaboration and teamwork

The researcher sought to get insights from teachers on their knowledge about collaboration and team work as one of the 21st century teaching competences and responses are as below:

Respondent 1: says

“In my class, I ensure that children work together during playtime and learning activities. For example, they share materials during group activities or sometimes take turns in group discussions...”

Respondent 2:

“During literacy lessons, I assign children group tasks during storytelling sessions where each child has a role, such as turning the pages, pointing to pictures, or retelling parts of the story...”

Respondent 4:

“I try to integrate collaborative learning by encouraging peer to peer learning. I pair the brighter children with the dull ones so that they get help from the brighter ones...”

Respondent 5:

“I understand the importance of teamwork in the classroom, but honestly, the children are so young that getting them to work together can feel almost impossible. Many of them don't even understand the concept of sharing yet...”

Respondent 7:

“We are always encouraged to use group activities, but the resources are limited. How can I divide the children into groups when we don’t even have instructional materials for individual activities...”

Respondent 9:

“Even collaboration among teachers is still a challenge. When it comes to scheming and lessons planning together or sharing strategies, everyone prefers working on their own.”

Observational data highlights inconsistencies in implementation, with many children either disengaged or overshadowed by peers during group activities for instance:

Observation Report 1:

During one of the lessons where the teacher was teaching literacy, she instructed the children to read in pairs, however, only a few pairs were actively engaged. Many children either worked individually or were idle while waiting for the teacher’s attention.

Observation Report 2:

During a mathematics lesson the observation showed that children were merely sitting together while two of them were grouping items to form sets. Others concentrated on their individual work with little interaction or shared decision-making.

Observation Report 3:

Teachers often viewed teamwork initiatives, such as co-teaching or joint lesson planning, as burdensome rather than opportunities for professional growth.

Head teachers 'perspectives on teachers 'application of collaboration and teamwork

Respondent 11 says:

“Some teachers genuinely try to use teamwork in their classrooms, but the children are too many which is a challenge to meaningful collaborative teaching methods...”

Respondent 12:

“Most teachers claim to use collaborative approaches, but when I observe their lessons, I notice that many of them still rely on teacher-centered methods...”

Respondent 13:

“I have noticed that experienced teachers often hesitate to mentor younger or less experienced colleagues. There is a lack of openness when it comes to sharing successful teaching strategies or classroom management techniques...”

Respondent 15:

“In my experience, some teachers view their colleagues as competitors rather than partners. They are more focused on individual achievements, such as their class results, than on collective success as a team...”

Analysis

The data indicates that teachers' perception of collaboration, observational data, and head teachers' feedback underscores a critical discrepancy. While teachers recognize the importance of collaborative teaching, they struggle to translate these principles into actionable classroom practices due to systemic and individual challenges.

Theme Fostering creativity

The researcher sought to understand what teachers know about the application of creativity in their day –today classroom teaching. The responses indicate that they lacked teaching

resources which forced them to limit creative tasks, leading to a predominantly teacher-centered approach rather than one that encourages exploration and innovation as below:

Respondent 2 says:

"I understand the importance of using creative and innovative strategies and I have attended workshops that emphasized them. However, when I try to implement them in my classroom, I find it difficult to manage time and keep all learners engaged. I am forced to use simple methods which the children understand to cover the syllabus on time..."

Respondent 3 argued that:

"The school head teacher here provides support supervision to teachers by conducting classroom visits during lessons to ensure that the teachers are implementing the EGR teaching methods which encourage creativity in the classrooms. These practices of supervisory support have helped in ensuring that the teachers are updated with the latest trends and teaching competences..."

Respondent 4: Full of energy says,

"In my class, I use play-based methods to engage the children and allow them to learn at their own pace."

Respondent 5: Explains that

"I always encourage my learners to participate actively. I give them group activities and let them explore answers by themselves..."

Respondent 7 says that:

"I always provide hands-on learning experiences for my children."

Respondent 7 noted:

"With over 150 children in one classroom, it's impossible to give each child the attention they need to explore their creative abilities."

During observation, the teacher uses drills and flashcards, expecting all learners to respond simultaneously, with no evidence of play or giving individual learners extra support.

During class, the teacher predominantly lectures, asking learners to repeat after her, with little to no group work observed.

The teacher demonstrates activities without involving the children directly, resulting in a teacher centered learning environment.

Headteacher's perspectives about teachers fostering creativity in their classrooms

These perspectives from headteachers suggest a disconnect between teachers' intentions and what they do to promote creativity in their classrooms.

Respondent 11. Says that;

"Teachers are always struggling to support children during activities requiring individual input and creativity due to overwhelming numbers in the classrooms..."

Respondent 12 suggests that;

"Teachers often equate group activities with fostering creativity, yet these activities don't fully engage children in original thoughts or problem-solving..."

Analysis

The findings reveal a significant gap between teachers' self-perception and actual classroom practices. While most teachers believe that they incorporate creativity and innovation in their classrooms, observational and administrative data suggest otherwise. This discrepancy underscores the need for professional development programs focused on practical strategies for

creative teaching, as well as institutional support to facilitate a more innovation-driven learning environment.

Theme: Integration of digital tools and resources during lesson delivery.

4.1.4 Application of ICT in teaching and learning in Lower Primary classes

In order to gather in-depth information regarding teachers' integration of ICT in the classroom as a 21st century teaching competences. The researcher probed the teachers to talk about how they are using ICT.

During the qualitative interviews, many teachers expressed their struggles with digital literacy and the application of digital tools in teaching. Some of their responses include:

Respondent 1 said;

“In Iganga Municipality, most of the teachers in lower primary classes do not have knowledge on how to use computers which affects their use of digital materials...”

Respondent 2 observes that:

“We lack computer skills, and it affected most of us during COVID 19 lockdown whereby the reading materials were to be delivered to the learners electronically. Most staff members failed, and we had to wait for the lockdown to be lifted before we could resume lessons...”

Respondent 4 reacts that:

“In fact, we faced a lot of issues not just in terms of lack of electronic devices, but also internet access as staff members do not have money to buy data for handling digital learning...”

Respondent 5 says;

"I know that digital tools can be helpful in teaching, but I am not confident in using them. I normally use textbooks and other instructional materials."

Respondent 6 states that;

"We were not trained on how to integrate digital tools in our lessons, so I find it difficult to use them effectively."

Respondent 7 says;

"The school lacks any computer and internet access, so I don't see how I can incorporate digital learning in my lessons."

Respondent 10 says;

"Sometimes I want to try using technology in class, but I am afraid of making mistakes in front of my children "

Observation data focusing on digital literacy and technology application

The observation data revealed a significant gap in teachers' knowledge and implementation of digital literacy.

Observations showed that:

The majority of teachers struggled with basic knowledge of digital literacy, with many unable to use computers, operate projectors, interactive whiteboards, or learning management systems.

Some teachers appeared hesitant to incorporate technology in teaching and learning citing lack of training or confidence.

In all classrooms the children had no interaction with digital tools, missing out on potential benefits such as interactive learning, multimedia resources, and online collaborative activities.

Headteachers' perspectives

Several headteachers cited a lack of resources and training as the main reasons for the limited use of digital tools in classrooms. Some of their responses include:

Respondent 11;

"Our teachers are willing to use technology, but we simply do not have any digital resources. Our schools lack computers, projectors, and reliable internet connectivity..."

Respondent 12;

"The government and education stakeholders need to provide more training programs in digital literacy. Expecting teachers to integrate technology without the necessary skills is unrealistic..."

Respondent 13;

"While digital tools can enhance learning, most of our schools operate on limited budgets that do not prioritize the acquisition of expensive technological equipment..."

Respondent 14;

"Some teachers have tried to use digital tools, but the lack of professional development programs means they are not confident in using them effectively..."

Respondent 15;

"We acknowledge that technology is important, but without structured support, proper training, and adequate resources, expecting our teachers to fully embrace digital learning is a challenge..."

Analysis

These observations highlight a clear deficiency in digital literacy among lower primary teachers of Iganga Municipality and failure to leverage digital tools for enhanced learning experiences.

4.4.2 Theme: Practices being applied to deliver the 21st century teaching competences.

The researcher asked the respondents to reveal some of the practices they used to foster the 21st century teaching competences and these were their responses:

According to respondent 1,

“In this school, teachers use several practices to deliver the 21st century teaching competences. I for one use reflective practice. This is a situation where teachers go ahead and reflect on what they taught during the lesson, and they ask themselves questions like what went well, what did not go well, where do I need to improve, where did I go wrong? Where did I do well today? and how can I improve on what I did wrong?...”

Respondent 2 says:

“We also use collaborative learning to deliver lessons to the learners in lower primary classes...”

Respondent 3 said;

“I use practices like play based learning where the children are taught to beat, nod and dance words during the literacy lessons. We also use the continuous assessment of learning, and this practice enables the learner to improve on their reading and writing skills since the teachers keep assessing the learners in the subject areas and identify their weakness and help them improve...”

Respondent 4 said that;

“In my classrooms I apply several methods of the 21st century teaching competences for example I use grouping of learners in the classrooms during the lessons. This method enables them to learn from one another, since some of them are not free with their teachers but can easily learn from each other. I also do observation through

reflecting upon what I taught during the lesson of the day. In the process, I am able to recall and identify where I went wrong and how to improve. Additionally, I take note of what I did well and devise means of improving for better...

Respondent 6 said that;

“In our school, the lower primary classes are given activities during the learning process, as a means of incorporating the 21st century teaching competences to ensure that the learners benefit from the lessons. Some of these activities are in form of plays among others...”

Observation data

During lessons observation, the researcher saw teachers using storytelling and drama activities during literacy and English language strands. The teachers encouraged children to act out scenarios related to real-life situations, which promoted creativity, critical thinking, and emotional intelligence. The use of songs and rhymes was also observed. This supported literacy and phonological awareness, making learning enjoyable and memorable.

Perspectives from Headteachers

Head teachers observed positive transformation in some classrooms where collaborative learning and play-based pedagogy were effectively implemented.

Respondent 11 noted

"Teachers who embrace collaborative learning create a vibrant learning environment where the children feel valued and confident. The interaction among the children builds social and communication skills that go beyond the classroom..."

Respondent 13 highlighted the benefits of play-based learning, stating,

"Through play-based pedagogy, children learn from each other while developing creativity and problem-solving abilities. We have seen remarkable improvements in the children's learning..."

Respondent 15 emphasized the role of these strategies in holistic development of the children:

" Our teachers are not only educating but also nurturing well-rounded learners prepared for future challenges..."

Analysis

The analysis reveals that lower primary teachers in Iganga Municipality applied certain 21st century teaching competencies like play-based pedagogy and collaborative learning during some lessons especially literacy and English language. These strategies fostered critical thinking among the learners and promoted life skills such as teamwork, creativity, and problem-solving.

4.2.4 Theme: Challenges faced by teachers in professional development

It was vital to understand the challenges faced in incorporating and applying the 21st century teaching competences in the teaching approaches being used by the teachers and the responses gathered from the respondents were:

Respondent 1;

"With the many responsibilities I have it is difficult to go back for upgrading. I don't have enough the money and time to balance professional development with my workload."

Respondent 2 says that:

"Upgrading programs often require payments, and many of us can't afford them. Our school also doesn't provide enough resources to support ongoing learning."

Respondent 4 argues that:

"New teaching methods are introduced frequently, but adapting to them can be overwhelming. Some teachers prefer sticking to what they know works rather than trying something unfamiliar."

Respondent 5

"But for me I cannot go back for upgrading because I have many children to pay for and my little salary cannot support me to go back for upgrading and pay fees for my children...".

Respondent 6 explains that:

"We attend workshops, but there's no follow-up support to ensure we apply what we learn".

Respondent 8 observes that:

“There are many problems but let me give you what I really think is serious and needs quick attention. There is a problem of having too many learners in the classroom that even the teacher cannot prepare enough instructional materials for all of them...”

Respondent 10 maintains that

“The time allocated for lessons seems too small to handle the large population, so you find that the teacher cannot conduct all the steps required in the lesson ...”

Observation

The observation data reveals that teachers face significant challenges in accessing and benefiting from professional development opportunities including; time constraints, financial barriers, inability to afford training costs and lack of institutional support. Additionally, resistance to change among some teachers and insufficient administrative encouragement have also hindered professional growth. Furthermore, teachers report lack of follow-up after trainings making it hard to implement new strategies effectively.

Head teachers' perspectives

Responses from the head teachers indicate that there are many challenges faced in ensuring that the 21st century teaching competences are incorporated in classrooms.

Respondent 11 explains that:

“First, we have some teachers who are resistant to change. They fear to fail and therefore prefer to use the rudimental/traditional methods of teaching...”

Respondent 12 also argues that:

“The schools do not have resources to implement the 21st century teaching competences such as instructional materials, digital materials, data and many other resources and this really affects the entire process...”

Respondent 13 asserts that:

“The school management here has tried to send staff for workshops for EGR and STIR although many of them aren't able to attend such workshops...”

Respondent 14 says:

“Some teachers have also taken their own initiatives to upgrade since the trends and dynamics in the academic world keep changing...”

Respondent 15 said that;

“One of the problems is limited infrastructure in terms of classroom space to fit the high number of children admitted in the schools because some classes even conduct lessons under trees...”

Analysis:

The findings indicate that both teachers and headteachers are struggling in the implementation of 21st century teaching skills. The teachers face barriers in accessing and applying professional development, while headteachers struggle with the resources and structures necessary to make these programs effective.

4.3 Approaches to Retool Teachers of Lower Primary and Enhancement of 21st Century Teaching Competences

4.3.1 Theme: Approaches to Retool Teachers of Lower Primary towards implementation of 21st century teaching competences.

The researcher found it important to capture the responses from the respondents about the approaches that can be used to retool teachers of lower primary to implement 21st century teaching competences as below.

Respondent 1 said that:

"We need more interactive workshops where we can practice using digital tools, collaborative learning strategies, and inquiry-based teaching and learning..."

Respondent 2 notes that:

" We need ongoing learning opportunities that allow us to gradually integrate 21st-century skills into our teaching..."

Respondent 3. states that:

"Learning from fellow teachers who are already using innovative methods would be helpful. If schools could establish mentorship programs, we could support each other in adopting new strategies..."

Respondent 4 notes that:

"We need proper training on how to use technology in the classroom, including tablets, smartboards and online learning platforms, to make lessons more engaging."

Respondent 5 noted that:

“CCTs and inspectors should visit our classrooms, observe our lessons and give us practical feedback on how to integrate 21st-century teaching techniques effectively...”

Respondent 6 said that:

" Headteachers should actively support teacher development by providing necessary resources for us to experiment with new teaching methods..."

Respondent 7 notes that:

"The curriculum should be adjusted to align with 21st-century skills without overburdening teachers. We need simplified guides on how to integrate creativity, critical thinking, and problem-solving in lower primary lessons..."

Respondent 9 states that:

"Bringing in education experts like child psychologists and technology specialists for workshops would help us understand how to make learning more child centered and interactive..."

Observation data

Classroom observations reveal that many teachers face challenges in effectively embedding the 21st century teaching competencies into their teaching practices. Thus, it

is evident that teachers require intentional and sustained retooling programs to effectively implement 21st-century skills.

Head teachers' perspectives

These responses from focused group discussions with headteachers highlight the specific areas where teachers need support for targeted professional development and retooling initiatives.

Respondent 11 states that:

“Additional support for our teachers is required in exposure to innovative teaching methods such as storytelling, play-based learning and integrating literacy with digital tools to significantly improve learning outcomes...”

Respondent 12 explains that:

“Our teachers should be trained in structuring interactive lessons. Some of them feel overwhelmed by group work and interactive activities because they lack the necessary classroom management techniques...”

Respondent 13 said that:

“Teachers need guidance on using formative and competency-based assessments that measure creativity, problem-solving and collaboration. I recommend capacity-building sessions on alternative assessment strategies to bridge this gap....”

Respondent 14 argues that:

“Organising CPDs for the teachers in digital literacy and the use of interactive learning platforms would greatly enhance their ability to engage young learners and develop 21st-century skills...”

Respondent 15 notes that:

“I think government can do something in line with paying for teachers to upgrade, if something is done in that line it can really help teachers incorporate and apply the 21st century teaching competences...”

Analysis

Both teachers and headteachers underscore the need for structured support through workshops, peer mentoring and ongoing professional learning communities. Therefore, retooling initiatives should be prioritized to bridge this skills gap and enhance the overall application of 21st century teaching competences.

4.3.3 Ways in which support from the school is perceived in promoting 21st Century Teaching Competences.

It was also vital for the researcher to find out ways in which the different teachers perceived the support from the schools was aiding them in applying 21st century teaching competences in lower primary. They responded as follows;

Respondent .1 explains that,

“The school is poorly facilitated, and we do not have money to buy materials meant to implement the 21st century teaching competences...”

Respondent 2. notes that:

“The school sometimes sends teachers for seminars and workshops, however, very few teachers always attend the workshops which affect the performance of the school in implementation of 21st century teaching competences...”

Respondent 3 says that:

“Parents and the community are not actively involved in supporting 21st-century learning because there are no structured programs to engage parents in digital literacy or critical thinking activities with their children...”

Respondent 4 explains that:

“With overcrowded classrooms and heavy workloads, it is nearly impossible to implement differentiated instruction or interactive teaching methods effectively. We need more support in managing class sizes and lesson planning...”

Respondent 5 notes that:

“The curriculum is overloaded, and we work on pressure to complete the syllabus. If you focus on children's creativity, problem-solving, critical thinking project-based or inquiry-based learning, then you can't accomplish your work...”

Respondent 7 explains that:

“There are no structured opportunities for teachers to work collaboratively, share best practices, or engage in professional learning communities. We mostly work each man for himself, which limits our ability to grow and innovate together.”

Respondent 10: reported that;

“The school cannot afford the computers or digital tools to use for teaching and it has really affected the performance of the school in terms of implementing 21st century teaching competences...”

Observation

Most respondents feel that their schools provide insufficient support in fostering 21st century teaching competences. They cited limited professional development opportunities, inadequate access to technology knowledge and tools, minimal collaboration opportunities, rigid curricula, lack of administrative backing, large class sizes and less parental involvement in supporting them.

Head teachers' perspectives

Most headteachers acknowledged the importance of implementing 21st-century teaching competencies in their schools but feel unable to support their teachers highlighting key challenges due to inadequate and delayed government funding under the UPE program as in the responses below:

Respondent 11 explains that:

“As school administrators, we would love to support our teachers more effectively, but without adequate financial resources, there is little we can do. The government must increase and release UPE funds on time to enable us to create an environment conducive to 21st-century learning...”

“We lack the resources to organize effective school-community programs. The government funding we receive barely covers school necessities, making it impossible to invest in such initiatives...”

Respondent 12 explains that:

“Organizing for teachers' workshops or professional learning communities requires financial resources which we do not have. The government's financial support is inadequate, leaving all of us overwhelmed...”

Respondent 13 says that:

"We understand the need to integrate technology into teaching but the government funding we receive is too little to invest in digital resources. Most of our funds go towards maintaining basic school operations, making it difficult to equip the school with computers, projectors, or internet access..."

Respondent 15 notes that:

"The little funding we receive is barely enough to cover essential school expenses, leaving no room for teacher capacity-building initiatives..."

Analysis

It is evident that there is a shared concern between teachers and headteachers regarding the lack of institutional support in promoting 21st-century teaching competencies. They find themselves falling back to the traditional methods due to a lack of resources. Headteachers equally feel constrained by delayed and insufficient government funding. Both parties acknowledge the need for deliberate support tailored towards 21st century teaching competences.

4.3.4 Resources that can Support in integrating the 21st Century Teaching Competences

The researcher found it necessary to find out the resources that may be needed in integrating the 21st century teaching competences and the responses captured from the respondents are;

Respondent 1 said that:

"The schools need to be supported with several resources to enhance the integrating of the 21st century teaching competences such as instructional materials..."

Respondent 2 observes that:

“The schools need to be provided with professional development workshops to equip the teachers with the new methods of teaching...”

Respondent 3 observes that:

"Collaborating with fellow teachers through professional learning communities can provide insights on how to integrate critical thinking and problem-solving strategies in my teaching..."

Respondent 4 observes that:

"Having a mentor who guides us in implementing innovative teaching strategies has improved our approach to competency-based learning..."

Respondent 6 notes that:

"Using storybooks and real-life case studies can help to develop learners' problem-solving skills and communication abilities, which are essential in the 21st century..."

Respondent 8 states that:

"Community partnerships, such as guest lectures from professionals and field trips, help learners connect classroom knowledge with real-world applications, fostering critical thinking and creativity..."

Observation

Based on these observations, it is clear that deliberately targeted interventions such as investment in teacher capacity-building, provision of digital and instructional resources, and enhancement of school-community collaboration are enhanced to bridge the gap between current teaching practices and the demands of 21st-century education.

Headteachers perspectives**Respondent 11 argued that:**

“The number of staff in the schools needs to be increased to handle the high number of learners enrolled in lower primary classes...”

Respondent 13 explains that:

“To effectively integrate 21st-century teaching competencies, our teachers need access to modern digital tools such as computers, projectors, and interactive whiteboards...”

Respondent 14 notes that:

“We need educational software and online learning platforms to facilitate collaboration, creativity and problem-solving skills in our classrooms...”

Respondent 15 says that:

“Tablets and e-learning resources would be beneficial for interactive lessons...”

Analysis

The successful integration of 21st-century skills in teaching and learning requires a multifaceted approach including investment in technology, continuous professional development, updated teaching materials and supportive learning environments. Strong collaboration between schools, communities and policymakers is crucial in ensuring that teachers have the necessary tools to develop learners' critical thinking, creativity, communication and problem-solving skills.

Discussion, Conclusion and Recommendation of the Findings

5.1 Introduction

This chapter discusses the study's findings in relation to its main objectives. The findings are interpreted, and it is made clear why they are pertinent to the research considering findings from other studies conducted by various researchers. The results of this study are based on the interpretation and analysis of information gathered using a questionnaire and interviews with respondents. The chapter also includes the conclusions drawn from the conversation and the recommendations that followed. The chapter concludes with a list of specific areas that are suggested for further study.

5.2 Discussion of Results

This section presents the discussion of findings as derived from the study, basing on each objective.

5.2.1 Teachers' Knowledge of 21st-Century Teaching Competences

The first objective of the study was to examine the teacher's knowledge about the 21st century teaching competences being used to children in lower primary. The results revealed that the teachers had knowledge about the 21st century teaching competences and this knowledge was got through workshops and seminars organised by EGR and STIR. This study finding was not consistent with that of Reimers & Chung (2018) who observed that in many countries teachers are often inadequately prepared to teach well which is not the case in Iganga where the teachers' have been trained on 21st century teaching competences by STIR and EGR.

The results of objective one also revealed that although teachers receive training and are ready to implement the 21st century teaching competences in their classrooms, they are faced with

other challenges such as lack of instructional materials, lack of digital resources and high population of the learners to be taught in the classrooms. This study however contradicts with that of Ackah (2020) who argued that teachers are underprepared in the use of 21st century teaching competences and hence they are unable to transfer 21st century skills to their learners.

5.2.2 Practices being applied to Deliver the 21st Century Teaching Competences

The second objective of the study was to examine the 21st century teaching competences and practices being applied by lower primary class teachers to enhance the 21st century skills among learners. The results revealed that the teachers used several practices to deliver the 21st century teaching competences such as reflective practices, collaborative learning and play based learning. This study finding was consistent with that of Diamantopoulos & Papanis (2018) who advanced that teachers of ECD encourage collaborative learning experiences in their classrooms which helps young children to develop social and communication skills through designing group activities and projects that promote teamwork and cooperation among learners.

This study finding also contradicted with that of Plowman & Stephen (2017) who argued that teachers of ECD effectively apply digital literacy and technology, interactive learning tools and apps specifically designed for young children to facilitate teaching and learning in several ways such as educational games, virtual manipulatives, and storytelling. This researcher found out that these were not used in the selected schools in Iganga Municipality.

The results also revealed that teachers incorporate different experiences in teaching learners such as grouping among others and this finding concurs with that of Gay (2018) who argued that class teachers of lower primary classes promote cultural competency and global awareness by incorporating diverse perspectives and experiences into their teaching.

5.2.3 Approaches to Retool Teachers of Lower Primary and Enhancement of 21st Century Teaching Competences

The last objective of the study was to explore the approaches that can be used to retool teachers of lower primary classes of schools in Iganga Municipality to enhance their 21st century teaching competences. The results revealed that approaches such as creation of collaborative learning communities, use of innovative teaching, modeling, case studies and reflective learning can be used to retool the teachers of lower primary. This finding coincided with that of Wong (2019) who argued by incorporating reflective practices into their teaching, teachers can become more aware of their strengths and areas needing improvement and growth which can lead to the enhancement of their 21st-century skills.

The study also revealed that teachers in Iganga Municipality considered government sending teachers for further studies to upgrade and creation of local learning centers, encouraging the teachers to attend workshops and seminars to be the ways of retooling the teachers in lower primary. This study findings were also consistent with that of Ackah (2020) who argued that the programs should deliberately emphasize the use of technology, critical thinking, collaboration, and creativity which are crucial in enhancing the teaching skills of teachers and enabling them to stay updated with the latest research and best practices in education as critical components in the on-going learning and growth.

5.3 Conclusions of the Findings

Based on the discussions of the findings above the researcher would therefore make the following conclusions in line with the objectives;

5.3.1 Teachers' Knowledge of 21st-Century Teaching Competences

The first objective of the study was to examine the teacher's knowledge about the 21st century teaching competences being used to children in lower primary. The researcher therefore concludes that the teachers in lower primary in Iganga Municipality had knowledge about the 21st century teaching competences and this knowledge was got through workshops and seminars organised by EGR and STIR.

The study also concludes that teaching methods and instructional materials are key in the implementation of the 21st century teaching skills in lower primary in Iganga Municipality.

The researcher also concludes that teachers in Iganga Municipality are prepared to apply the 21st century teaching competences in the classrooms. However, they do not have the instructional materials, digital materials to facilitate the process of implementing this program in their classrooms.

5.3.2 Practices being applied to Deliver the 21st Century Teaching Competences

The second objective of the study was to examine the 21st century teaching competences and practices being applied by lower primary class teachers to enhance the 21st century skills among learners. The researcher concludes that the teachers used several practices to the deliver the 21st century teaching competences such as reflective practices, collaborative learning and play based learning.

The researcher also concludes that teachers incorporate different experiences in teaching learners such as grouping, among others.

The study also concludes that children in lower primary in Iganga Municipality have benefited from the different programs of the 21st century teaching competences that have been introduced in their classrooms by the teachers. Some of the benefits included being able to learn from one another.

5.3.3 Approaches to Retool Teachers of Lower Primary and Enhancement of 21st Century Teaching Competences

The last objective of the study was to explore the approaches that can be used to retool teachers of lower primary classes of schools in Iganga Municipality to enhance their 21st century teaching competences. The results conclude that approaches such as creation of collaborative learning communities, use of innovative teaching, modeling, case studies and reflective learning can be used to retool the teachers of lower primary. The findings from both teachers and head teachers indicate a critical need for support resources to effectively integrate 21st-century teaching competences into teaching and learning. It is evident that while teachers and headteachers recognize the importance of fostering critical thinking, creativity, communication, collaboration and digital literacy, they face significant resource constraints that hinder full implementation.

Teachers expressed the need for modern digital tools, continuous professional development and updated instructional materials to enhance their ability to deliver 21st century teaching competences. Similarly, head teachers emphasized the necessity of technological tools, collaborative learning spaces and financial support to create a conducive environment for 21st-century learning.

The lack of access to ICT tools, insufficient training opportunities and inadequate teaching materials remains a major challenge in schools. Additionally, there is a need for stronger community partnerships and policy support to ensure the sustainable implementation of 21st-century skills.

The study also concludes that schools in Iganga Municipality are poorly facilitated to implement the 21st century teaching competences in their classrooms which have affected the implementation of the programs.

5.4 Recommendations of the Findings

Recommendations

The researcher recommends that:

Educational stakeholders prioritize capacity-building initiatives that empower teachers with relevant methodologies, ensuring that learners are equipped for success in an increasingly complex world.

Additionally, stakeholders need to consider providing professional development through workshops, mentorship programs and online training on critical thinking, creativity, collaboration and communication to the teachers. Continuous Professional Development (CPD) Programs

The Ministry of Education and school leadership should provide regular workshops, mentorship programs, and in-service training to enhance skills in critical thinking, creativity, collaboration, and digital literacy.

Schools should invest in digital tools and provide teachers with training on how to effectively use educational technology in the classroom.

Headteachers should encourage the adoption of ICT resources such as interactive whiteboards, online learning platforms, and digital assessment tools to enhance learner engagement and outcomes.

Headteachers should take a proactive role in promoting 21st-century competencies by setting clear expectations, providing the necessary resources, and fostering a culture of innovation.

Leadership training programs should be designed to equip school administrators with skills to support teachers in adopting modern teaching practices.

Teachers should embrace collaborative teaching methods such as team teaching, peer coaching, and professional learning communities.

Schools should create platforms where teachers can share best practices, lesson plans, and experiences in implementing 21st-century skills.

Supporting Quote:

"When teachers see that their efforts in teamwork are recognized and supported, they are more likely to engage meaningfully and contribute to the collective success of the school..."

Addressing these issues requires a multifaceted approach, involving professional development, systemic support, and a cultural shift within schools to value and prioritize collaboration.

5.5 Recommendations for Further Studies

The study was restricted to teacher's preparedness and enhancement of the 21st century teaching competences in lower primary among selected schools in Iganga Municipality. However further studies may also be conducted in the following areas;

Involvement of school administration in the implementation of the 21st century teaching competences in government primary schools in Uganda.

Teacher's attitudes towards the implementation of the new education policies and teaching methods in classrooms in lower primary.

New pedagogy and teaching of reading skills among learners in pre-primary schools in Uganda.

Level of parental involvement in education of learners and the learner's success in pre-primary schools.

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APPENDIX A: INTERVIEW GUIDE

Teachers' Interview Guide

Objective i: *To analyze how teachers of lower primary classes in Iganga Municipality are knowledgeable about 21st-century teaching competences.*

Welcome the participants and explain the purpose of the interview

1. Teachers' Knowledge of 21st-Century Teaching Competences.

- a. How has your personal or professional experience in teaching lower primary classes impacted on your application in the 21st century teaching skills?

.....

b. In your own opinion, explain some of the key 21st century teaching competences you believe are essential for the learner’s success.

.....

c. What steps do you take to stay updated with the latest trends and research in early childhood education?

.....

d. What challenges have you encountered as a teacher of lower primary classes while applying 21st century

.....

e. Have you received any training or professional development related to 21st-century teaching competences?

.....

Objective ii: *To examine the 21st-century teaching competences and practices being applied by lower primary class teachers to enhance 21st-century skills among learners.*

2. 21st-century teaching competences and practices

f. Describe some specific teaching practices or strategies you use to foster 21st-century skills among your learners.

.....

g. How do you incorporate 21st-Century Teaching competences into your teaching methods and classroom practices?

.....

h. How does incorporating 21st-Century teaching competences into your classroom to enhance learning experiences for young children?

.....

i. What challenges do you encounter when incorporating and applying 21st century teaching competences in your teaching approaches while in class?

.....

Objective iii: *To explore approaches that can be used to retool teachers of lower primary classes of schools in Iganga municipality to enhance their 21st-century teaching competences.*

j. What approaches do you think can be used to retool teachers of lower primary?

.....

k. What additional training or professional development do you need to improve your understanding and application of 21st-century teaching competences?

.....

l. What specific areas of 21st-century teaching competences do you believe you need further support or training in?

.....

m. What kind of support or resources do you think would be helpful in enhancing your ability to integrate 21st-century teaching competences effectively?

.....

1. Closing Remarks:

a. Thank the participants for their time and valuable input.

b. Ask if there is anything else they would like to add or any suggestions they have regarding the topic.

Top of Form **Focus Group Discussion Interview Guide**

To analyze how headteachers of lower primary classes in Iganga Municipality are knowledgeable about 21st-century teaching competences

Introduction:

1. Welcome and thank the headteacher for participating in the interview.
2. Briefly explain the purpose and objectives of the research.
3. Assure the headteacher that all responses will be kept confidential and used for research purposes only.

Objective i: *To analyze how teachers of lower primary classes in Iganga Municipality are knowledgeable about the 21st-century teaching competences.*

1. How would you describe the current level of awareness among your teachers of lower primary classes regarding 21st-century teaching competences?

.....
...

2. In your opinion, which specific 21st-century teaching competences are the teachers of lower primary classes most familiar with?

.....
...

3. Are there any challenges or areas teachers seem to lack sufficient knowledge about 21st-century teaching competences?

.....

Objective ii: *To examine the 21st-century teaching competences and practices being applied by lower primary class teachers to enhance 21st-century skills among learners.*

4. Please provide some examples of teaching practices employed your teachers aligned with 21st-century teaching competences in lower primary classes?

.....

5. How do these teaching practices contribute to the enhancement of 21st-century skills among the learners?

.....

6. Are there any obstacles or barriers faced by teachers when implementing these practices?

.....

Objective iii: *To explore approaches that can be used to retool teachers of lower primary classes of schools in Iganga municipality to enhance their 21st-century teaching competences.*

7. What professional development opportunities are currently available to teachers to improve their understanding and application of 21st-century teaching competences?

.....

8. How do you assess the effectiveness of these existing professional development programs?

.....

9. In your view, what additional approaches or strategies could be implemented to further enhance the teaching competences of teachers related to the 21st-century skills?

.....

10. Are there any resources or support systems that could be provided to assist teachers in integrating 21st-century teaching competences effectively?

.....

General Questions:

11. How do you envision the role of the school administration in promoting the adoption and implementation of 21st-century teaching competences among the lower primary class teachers?

.....

12. Are there any specific challenges faced by the school or teachers in implementing these teaching competences?

.....

13. What are the potential benefits of integrating 21st-century teaching competences in lower primary classes?

.....

Conclusion:

14. Is there any additional information or insights you would like to share regarding the topic or any suggestions for further research in this area?

.....

15. Thank the Teadteacher for their time and willingness to participate in the interview.

.....

Top of Form

APPENDIX B: Head teachers' Interview Guide

To analyze how in-service Headteachers of lower primary classes in Iganga Municipality are knowledgeable about 21st-century teaching competences

Introduction:

1. Welcome and thank the Headteacher for participating in the interview.
2. Briefly explain the purpose and objectives of the research.
3. Assure the Headteacher that all responses will be kept confidential and used for research purposes only.

Objective i: To analyze how in-service teachers of lower primary classes in Iganga Municipality are knowledgeable about the 21st-century teaching competences.

1. How would you describe the current level of awareness among your teachers of lower primary classes regarding 21st-century teaching competences?

.....

2. In your opinion, which specific 21st-century teaching competences are the teachers of lower primary classes most familiar with?

.....

3. Are there any challenges or areas teachers seem to lack sufficient knowledge about 21st-century teaching competences?

.....

Objective ii: To examine the 21st-century teaching competences and practices being applied by lower primary class teachers to enhance 21st-century skills among learners.

4. Please provide some examples of teaching practices employed your teachers aligned with 21st-century teaching competences in lower primary classes?

.....

5. How do these teaching practices contribute to the enhancement of 21st-century skills among the learners?

.....

6. Are there any obstacles or barriers faced by teachers when implementing these practices?

Objective iii: *To explore approaches that can be used to retool in-service teachers of lower primary classes of schools in Iganga municipality to enhance their 21st-century teaching competences.*

7. What professional development opportunities are currently available to in-service teachers to improve their understanding and application of 21st-century teaching competences?

8. How do you assess the effectiveness of these existing professional development programs?

9. In your view, what additional approaches or strategies could be implemented to further enhance the teaching competences of in-service teachers related to the 21st-century skills?

10. Are there any resources or support systems that could be provided to assist teachers in integrating 21st-century teaching competences effectively?

General Questions:

11. How do you envision the role of the school administration in promoting the adoption and implementation of 21st-century teaching competences among the lower primary class teachers?

12. Are there any specific challenges faced by the school or teachers in implementing these teaching competences?

13. What are the potential benefits of integrating 21st-century teaching competences in lower primary classes?

Conclusion:

14. Is there any additional information or insights you would like to share regarding the topic or any suggestions for further research in this area?

.....

15. Thank the headteacher for their time and willingness to participate in the interview.

.....

APPENDIX C: Top of Form Classroom Observation guide

Objective 1: *To analyze how teachers of lower primary classes in Iganga Municipality are knowledgeable about the 21st-century teaching competences.*

Observation Points	Description
Technology Integration	Observe whether teachers incorporate technology (e.g., computers, tablets, interactive whiteboards) into their lessons to promote digital literacy and 21st-century skills.
Project-Based Learning	Assess if teachers implement project-based learning methods to encourage critical thinking, problem-solving, and collaboration among learners.
Differentiation Strategies	Look for evidence of teachers using differentiated instruction to cater to individual learning styles and needs, fostering personalized learning experiences.
Learner-Centered Approaches	Note whether teachers adopt learner-centered teaching methods, allowing learners to take ownership of their learning and become active participants in the classroom.
Communication and Collaboration Skills	Observe how teachers promote communication and collaboration skills through group work, discussions, and interactive activities.
Creativity and Innovation	Check for opportunities where teachers encourage creativity and innovative thinking among learners through open-ended tasks and creative projects.

Objective 2: *To examine the 21st-century teaching competences and practices being applied by lower primary class teachers to enhance 21st-century skills among learners.*

Observation Points	Description
Lesson Planning	Evaluate the lesson plans of teachers to identify how they incorporate activities that target specific 21st-century skills such as critical thinking and problem-solving.
Assessment Methods	Examine the assessment techniques teachers use to determine if they assess content knowledge and 21st-century skills development.
Use of Real-World Contexts	Note whether teachers create connections between classroom topics and real-world situations to enhance learners' understanding and relevance of the subject matter.
Integration of Creativity and Innovation	Look for instances where teachers encourage learners to think creatively and produce innovative solutions to problems or tasks.
Technology Integration	Observe the use of technology to support and enhance learning experiences, such as using educational apps, online resources, or multimedia presentations.
Cross-Disciplinary Teaching	Assess whether teachers integrate multiple subjects to demonstrate the interconnectivity of knowledge and foster holistic learning experiences.

Objective 3: *To explore approaches that can be used to retool teachers of lower primary classes of schools in Iganga municipality to enhance their 21st-century teaching competences.*

Observation Points	Description
Professional Development Opportunities	Look for evidence of ongoing professional development opportunities provided to teachers to update their knowledge and skills regarding 21st-century teaching.
Mentoring and Coaching	Observe if mentoring or coaching programs are in place to support teachers in integrating 21st-century teaching practices effectively.
Workshops and Training Sessions	Assess whether workshops and training sessions are conducted to introduce teachers to innovative teaching methods and technologies.
Collaboration Platforms	Observe if teachers are encouraged to collaborate and share ideas through platforms like teacher networks or online communities.
Teacher Support Networks	Identify if there are established support networks where experienced teachers can assist and guide their less-experienced peers.
Feedback Mechanisms	Check for feedback mechanisms that allow teachers to receive input from learners, parents, or colleagues to refine their teaching approaches.