

**DIGITAL TEACHING AND LEARNERS' PARTICIPATION IN LOWER
PRIMARY SCHOOL CLASSES IN BIDIBIDI REFUGEE SETTLEMENT,
YUMBE DISTRICT.**

BY

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DECLARATION

This dissertation is my original work and has not been presented for the award of a Master Degree in Early Childhood Education at any other University.

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APPROVAL

We as the University supervisors confirm the work done by the candidate under our supervision as original and true.

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DEDICATION

I humbly with grateful honor, dedicate my research dissertation to all caregivers and lower primary school teachers in Uganda more so the communities in the refugee settlements, whose wish is to improve their pedagogical practices amidst overarching circumstances.

ACKNOWLEDGEMENT

To God Almighty do I forever give the honor and glory for life in fullness in this short-lived life which seems long to man yet to Him means just a microsecond. You are truly GOD!

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ACRONYMS

AAP	American Academy of Paediatricians
AEP	Accelerated Education Program
DEO	District Education Officer
DIS	District Inspector of Schools
DUV	Digital Uganda Vision
ECD	Early Childhood Development
EFA	Education For All
ERP	Education Response Plan
LC	Local Council
ICT	Information and Communication Technology
ITU	International Telecom Union
MoES	Ministry of Education and Sports
NCDC	National Curriculum Development Centre
OPM	Office of the Prime Minister
RWC	Refugee Welfare Council
SDG	Sustainable Development Goals
SLC	Simbi Learn Cloud
SPSS	Statistical Package for Social Scientists

STEM	Science Technology Engineering and Mathematics
UCC	Uganda Communications Commission
UNEB	Uganda National Examination Board
UNESCO	United Nations Educational Scientific and Cultural Organization.

OPERATIONAL DEFINITIONS

- Digital applications:** These are computer programs created to carry out or facilitate a task on a computing device. It is a broad term that refers to any application software that can be used by a computer, mobile device, or tablet to perform useful tasks.
- Digital divide:** Gaps in demographics in terms of access to modern information and communications technologies, and those that don't or have restricted access.
- Digital methods:** The use of electronic elements to enhance or to change the experience of education.
- Internet:** A worldwide computer network that connects other computer networks, including government, private, and educational networks, using common communication protocols that allow data and information to be accessed and exchanged.
- Information and Communication Technologies (ICT):** Technological devices or developments are used for gaining information or communicating information with others.

Learner participation: This refers to on-schedule enrolment and progression at an appropriate age, access to regular attendance, learning consistent with national achievement norms, a learning environment that is safe enough to allow learning to take place, and opportunities to learn that are equitably distributed.

Technology: Any application of scientific knowledge for practical purposes.

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ABSTRACT

When teachers apply digital teaching devices, methods, and applications in the teaching and learning process, children develop socially, emotionally, physically, and cognitively through learner participation. This is because digital teaching improves learners' attendance, enrolment, performance, and completion rate. This study, therefore, was undertaken to examine "the application of digital teaching and learner participation in lower primary school classes in Bidibidi refugee settlement, Yumbe District". The study's objectives were to; describe the digital devices that improve learner participation in lower primary school classes, determine how digital teaching applications enhance learner participation, and establish the relationship between the digital teaching methods and learner participation. A descriptive cross-sectional research design was adopted for this study. A total number of 133 participants were computed using the standard sample formula. Sampling techniques were applied to select the participants through random and non-random, and these were purposive, simple random, and stratified. The participants included; 91 lower-class learners, 30 lower-class teachers, 10 head teachers from the selected schools of study, and 2 key informants from the Office of the Prime Minister in Bidibidi (OPM). Face-to-face interviews were conducted with the head teachers and key informants, questionnaire surveys with teachers, and observation with learners. Data was analyzed and processed using content, inferential, and regression analysis with figures, tables, and SPSS version 16.0 statistical measures used to interpret and present meaningful information. Results presented revealed that digital devices positively predicted learners' participation at (Beta = .280, $p = .019$), digital application, which was the highest positive predictor of learner participation at (Beta =0.575, $p=0.009$), and digital methods at (Beta =0.138, $p=0.027$). This implied that a unit increase in digital devices, applications, and methods led to; a .280, 0.575, and 0.138 increase in learners' participation and vice versa. The findings from the study suggested that; teachers and learners in Bidibidi primary schools have a positive perception of the applicability of digital teaching approaches in teaching and learning in lower primary school classes. The national education stakeholders and education agencies may need to invest more in the already existing digital teaching facilities and digital skilling of teachers for 21st century teaching pedagogies for quality education posterities.

CHAPTER ONE

INTRODUCTION

1.0 Introduction.

This chapter provides a background to the study, a statement of the problem, the purpose of the study, objectives, research questions, research hypothesis, significance, scope of the study, and concludes with limitations

1.1 Background.

The evolution of Sustainable Development Goal 4 (four) “quality and inclusive education” resulted in a worldwide campaign on “Education for All” (EFA) with primary schools’ parameters being access, attendance, and completion of the primary cycle by learners when enrolled. This has presented many shortcomings in primary education systems since most countries strive to achieve higher school enrolment which has over time compromised quality learning and teaching participation. The situation widens in lower primary classes, referred to as home-to-school transition classes which present stressful and challenging times for teachers and learners in terms of new language (s), overaged learners, violence and trauma, bullying, teasing, discrimination, and dropping out. Other barriers such as low access, low quality, and limited relevance in their learning opportunities. The education report by Tumwesige (2020), presented that much as about 50% lower primary school children enrolled in schools including in most refugee-hosting countries, there was still a big challenge of low learner participation registered above 50%.

Learners’ participation in lower primary school classes has been conceptualized in different forms by scholars. For example, Mulongo (2015), said lower primary learner participation which covers a variety of techniques that include; small group discussion, role-

playing, hands-on projects, and teacher-driven questioning following the curriculum at all levels. The goal was intended to lead learners into the process of their education. However, the concept has kept changing over time. By the 21st century, as reflected by Boville, and Bulley (2011), learner participation was conceptualized as active and engaged in the classroom, learners impacting curriculum design as well as learners' feeling of belonging to a community. This definition was similar to the Scottish Government (2013), which states that lower primary school learner participation included all of how children and young people engage in practices and dialogue with educational staff, parents, careers, and community members to create positive outcomes and change. Thus, lower primary learner participation in this study referred to when learners are involved in their education decision-making to benefit themselves through enrolment, access, and retention at an appropriate age, regularly attend and complete the primary education cycle to ensure learning which is consistent with the national achievement norms of education levels in Uganda as guided by education policies and curricula.

Different approaches and policy reforms have been tried and implemented by countries worldwide to address the pressure presented by overarching low learner participation in class activities in primary schools in refugee-hosting communities. Some of the strides included; positive and comfortable learning environments linked to improved learner participation; classroom seating patterns like rows, universal classrooms, U-shapes, and circles have also influenced good learner participation (Wasnock, 2017). Lower-class learners also learn best when facing their teachers in a classroom setting. Differential teaching expectations and class routines, calling patterns, instructional, and motivational support, co-teacher systems, and non-support interactions with the beliefs and behaviors of

learners were all connected with diverse forms of improved learner participation strategies each year (Ulianne & Turner 2020).

However, Florian (2021), emphasized that digital teaching as well as the school's digital facilities and digital learners' behaviors are part of the contributing factors in supporting learner participation in lower primary classes, for example, novel web-based multilingual learning platforms and solar-powered BrightBox, have allowed lesson content delivery in different languages simultaneously. This could include languages of lower-class learners and easy access to relevant digital curricula reading content in refugee-hosting primary schools. This seemingly new approach to teaching in refugee hosting communities has addressed the multilingual classroom language instruction and learner personal transition into classroom setting' (Simbi, 2022). This argument on digital teaching as one of the innovative ways of addressing learners' participation in lower primary classes in refugee hosting schools agreed with the popular instructional theory of cognitive constructivism derived from the education proponent and known education psychologist (Piaget, 1980). Cognitive constructivism encourages learner active participation through hands-on learning, collaboration, and social interaction among peers, who in this study are lower primary class learners (Taber, 2020).

In Africa just like in the global era, the coverage of digital teaching has expanded exponentially, revolutionizing traditional educational systems as a way of addressing education inequalities. UNICEF (2017), reported that children and adolescents under 18 account for an estimated one in three internet users around the world. This meant that the advent of online platforms, learning management systems, and interactive digital educational tools have opened up new avenues for learners and teachers alike in both development and emergency contexts (Mershad & Wakim, 2018). This shift has brought about personalized

learning experiences, collaborative environments, and flexible educational opportunities that cater to diverse learning needs in mixed refugee schools.

Within East Africa and Uganda, digital teaching has emerged as a beacon of hope for educational development, which has seen teaching and learning take a new shift. The vast geographical challenges and limited access to quality education, have seen a surge in the implementation of digital learning initiatives. The potential for digital technologies to overcome infrastructural barriers, East African nations like Kenya and Tanzania have been investing in e-learning solutions, mobile learning platforms, and digital content creation which addresses the overarching refugee school educational challenges (Ilevbare, 2019).

Uganda, in particular, has witnessed significant strides in digital teaching classrooms lower primary classes in both refugee and non-refugee schools. With a growing digital mobile penetration rate and an ambitious national digital strategy, the country has been actively promoting digital education shifts (UNDP, 2023). According to the National IT survey by UBOS 2019/2020, the average household ICT ownership and usage in West Nile sub-region in Uganda was 24.45% for radio sets, 31.4% for television sets, 4.6% for computers, and 59.7% for telephones. Initiatives such as the integration of tablets in schools, the development of digital content repositories, and teacher training programs on digital pedagogy have paved the way for a more inclusive and innovative education system (Ministry of Education and Sports, 2021). Thus, access to vast digital educational resources in refugee-hosting schools empowered teachers and lower primary school class learners alike, fostering personalized learning experiences, and efforts are made to bridge the digital divide to ensure equitable digital education classroom adoption for refugee-hosting schools equally (UWEZO, 2018).

Early in March 2017, Uganda became host to 1,199,051 refugees, with over 68% South Sudanese. The refugees from South Sudanese rose to 880,211 by the 15th of April 2017 mostly of them were settled in the West Nile districts, with the average number of new arrivals being 1,862 people per day in the first two weeks of March and April. In 2022, Bidibidi refugee settlement where 224,048 refugees were settled in an area previously hosting 221,300 people, more than the host population with 84% being women and school-going aged children. This hurt the local host communities, with schools and health centers overcrowded and lacking basic resources to cope with the influx which resulted in child protection emergencies and low education challenges. These presented huge pressure on school-going children, much as 50% continue to be enrolled in school, but there were still recurrent challenges of access, attendance, retention, and promotion which was highly attributed to low learner participation (UNHCR, 2019).

Uganda under the Office of the Prime Minister has partnered with different education agencies, donors, and other foreign governments to ensure education in refugee-inflated primary schools succeeds. Much of the efforts of government projects as extended by agencies and foreign governments have included the construction, protection, staffing, teachers' salaries, housing, furniture, and scholastic devices (Save the Children Uganda, 2020). All these interventions were aimed to address some of the school challenges for all children to ensure improved learning outcomes which include equitable, inclusive, and quality education and lastly to ensure lower primary school learners have strengthened commitment and capacity to maintain school structure and increased engagement with quality education provision (Abiku, 2022). The government also developed and disseminated the Thematic Curriculum and related reference books, and further created the Education Response Plan (ERP) unit under the Ministry of Education and Sports which was

charged with national refugee education partners' coordination mandate in collaboration with the Office of the Prime Minister (OPM) (NCDC, 2023).

These interventions all meant that education services in Bidibidi refugee-hosting schools have quite a better access to digital teaching resources that support their goals when returning to the classroom. More specific digital pedagogical interventions extended to some primary schools were the digital teaching solutions such as the BrightBox Micro cloud suitcase-sized solar-powered digital kit, tablet computers, and Accelerated Education Program (AEP) among others which are designed to facilitate better access to education to address the financial challenges faced by refugee hosting school going lower class children after the COVID-19.

Despite these novel innovations Uganda still stagnates at about 50% school enrolment of refugee children yearly. An indication that digital teaching pedagogies have prominent efforts to address the overwhelming related lower primary class challenges of access, attendance, performance, and retention (Tumwesige, 2020). This is because Uganda's lower primary education in refugee settlements continues to be confronted in three main encounters: access to, quality of, relevance, and post-COVID-19 demands. These have all presented more trajectories to diffuse the traditional classroom-centric educational delivery systems. In Bidibidi refugee settlement which was established in 2016 with a population of 244,184 children attending school becomes not exceptional (UNHCR, 2019). This was explained by less than 50% lower primary school refugee children enrolled in lower primary school classes in the past 5 years. While these low numbers found themselves at school; many languages, over-aged learners, violence and trauma, bullying, teasing, and ethnic discrimination have persisted in burying their early dreams of meaningful learning participation.

Whereas there is visible teaching with digital technology in Bidibidi refugee settlement for learning, most of these initiatives are done in secondary and tertiary institutions (Andoh, 2012). This left a gap of low learner participation for children in lower primary school classes in Bidibidi refugee settlement characterized by low access, attendance, retention, and performance.

1.2 Problem statement.

Under ideal circumstances, refugee settlements with digital teaching pedagogies in their primary schools have improved lower primary class learners' participation. These new forms of digital teaching have endured, evolved, and become a vital part of how education is delivered today to promote lower class learner participation.

However, Uganda's lower primary education in refugee settlements continues to be confronted in three main encounters: access to, quality of, relevance, and post-COVID-19 demands. The current statistics indicated that there are more than 286,859 refugees of lower primary class level living in Bidibidi Refugee Settlement with less than 50% enrolled in lower primary school classes in the past 5 years. While these low numbers strived to find themselves at school, the challenges of many languages, over-aged learners, violence and trauma, bullying, teasing, low-income status of parents, ethnic discrimination, and a large teacher-to-pupil ratio of 1:72 on average have persisted. Other school system gaps recognized in Bidibidi refugee settlement included teacher gaps at 1,347, desks at 57,316, latrine gaps at 2,631, and classroom gaps at 1,836. All these persistent conditions have contributed to low learner participation in lower primary school classes attributed to low attendance, access, retention, performance, and completion (Uganda Refugee Response Plan, 2023).

Despite the government of Uganda's efforts to ensure the continued extension of education services to refugee primary schools through the office of the Office of the Prime Minister,

(Abiku, 2022). In addition, the government has adopted policy guidance to scale up 21st-century new teaching pedagogical interventions such as BrightBox cloud solutions, tablet computers, and AEP to many primary schools within the settlement (Simbi, 2022), developed and disseminated the Thematic Curriculum, and related reference books (NCDC, 2023). These government efforts aligned with the current studies conducted in refugee primary schools on digital teaching such as by Bere, and Rambe (2019), studies on understanding digital teaching and active learner participation which focused on large-scale digital devices such as massive open online classes at higher institutions' usage in Yumbe district. Moreover Bonwell (2020), further researched on digital teaching and learner participation but it investigated digital methodologies at higher school levels in Yumbe (Thomas, 2019). Thus, these findings fell short of views in establishing the direct impact of promoting learner participation in lower primary schools in Bidibidi refugee communities, Yumbe district.

Hence, the timeliness of this study to investigate the impact of applying digital teaching in lower primary schools on learner participation. This could support to evaluate the insights into digital teaching that have been evidenced to promote learners' participation in refugee-hosting schools, beyond only Bidibidi communities.

1.3 Purpose of the study.

The purpose of this study was to investigate how the application of digital teaching promoted learner participation in lower primary school classes in Bidibidi refugee settlement, Yumbe District.

1.4 Objectives.

The specific objectives of the study were to:

- i) Determine the digital teaching devices that aid learner participation in lower primary school classes in Bidibidi refugee settlement
- ii) Describe how digital teaching applications enhance learner participation in lower primary school classes in Bidibidi refugee settlement.
- iii) Investigate whether there was a relationship between digital teaching methods and learner participation in primary school classes in the Bidibidi refugee settlement.

1.5 Research questions.

- i. What digital learning devices improved learner participation in lower primary school?
- ii. Which digital teaching applications enhanced learner participation in lower primary school classes?
- iii. How does the relationship between digital teaching methods promote learner participation in lower primary classes?

1.6 Study hypothesis.

The application of digital teaching in lower primary school classes positively influenced learner participation.

Based on the increasing integration of technology in education, this hypothesis proposed that the use of digital teaching methods in lower primary school classes had a positive impact on active learner participation. The hypothesis suggested that when digital tools such as interactive digital radio sets, smartphones, tablets, laptop computers, educational digital apps, and other related multimedia resources are incorporated into the

classroom, learners demonstrate higher levels of engagement and active participation in educational learning activities.

1.7 Scope.

- (i) **Geographical scope;** The study involved 10 primary schools within Bidibidi refugee settlement, Yumbe District.
- (ii) **Time scope;** this was a 7-year time scope that was considered from 2016 to 2022. This was about the year 2016, when the Bidibidi refugee settlement was started, and the year 2022 when this study topic was approved and research conducted.
- (iii) **Content scope;** the study was on the application of digital teaching and learner participation in lower primary school classes in Yumbe district. Lower primary classes were preferred for this content scope because they are defined by age as learners between the age group of 6-8 years, which aligns with the scope of the academic degree under study (NIECD Policy, 2016). And since the lower primary education system in Uganda is more structured and largely government-aided as compared to pre-primary, it was preferred.

1.8 Significance of the study.

- (i) The study shall provide empirical information to the education reform commission to address the issue of ensuring digital teaching at all levels and contexts, including the refugee hosting communities. This makes the work of the policymakers, leaders, and administrators to find reference data to deliver on this aspect of the policy change in education for Uganda, especially for the primary school level.

- (ii) This study shall benefit teachers and learners in Bidibidi refugee primary schools to apply digital teaching pedagogies meaningfully into their classroom practices and self-paced educational needs.
- (iii) The study could help teachers design digital teaching content lessons and develop their knowledge to scaffold young children's prior experiences through structured classroom practices.
- (iv) The study shall be insightful to the inclusive development, implementation, and achievement of national and international policies and education reforms such as; the Education Act 2008, Refugee Response Plan 2024/2025, SDG 4, UNDP 3, The digital agenda, and Vision 2040.

1.9 Limitations of the study.

The study was mindful to emphasize to the reader that there are a couple of factors that need to be understood as limiting factors in light of these undertakings. During this research study, a few factors were considered.

The study had adequate background, and observation was mentioned as one of the tools that helped to collect data, particularly from at least lower primary classes in each school of study to supplement teachers' feedback through questionnaires. Nonetheless, due to the schedule to reach planned schools within the lesson hours, the field circumstances constrained the observation method. Consequently, this may have a slight impact on the quality of the data.

The study methodology adopted was a descriptive survey design with questionnaires, interviews, and observation with limited time scope, and demographic coverage to only lower-class teachers, and head teachers in a few primary schools. Yet there could have been a possibility to carry out this similar study in a more exploratory or

experimental way with wider coverage to try out some of these digital teaching devices, methods, and applications to establish their impact on lower-class learners' participation in real-time and situations in education.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction.

This chapter focused on the theoretical framework, the conceptual framework, and reviewed the literature on the following objectives; Digital teaching applications that promote learner participation, Digital applications that enhance learner participation, and digital methods that promote learner participation.

2.1 The theoretical framework.

The study assumed that lower primary school learners who may benefit from digital teaching participate better in class. Some theories that support this assumption include Dewey's theory of progressive education. Connectivism theory by (Siemens, 2008). Stated that the emergence of the internet, particularly Web 2.0 has provided access to the views and opinions of a wide range of individuals opening up opportunities for new forms of communication and knowledge formation. Connectivism is one of the most prominent of the network learning theories that have been developed for e-learning environments, the study contemplated its use alongside cognitivism theory. One of the principles of connectivism is how higher order thinking skills are activated when learners can distinguish which of the abundant and diverse information available online is reliable or sustainable (Siemens, 2005). This connectivism principle is aligned with the Center for Advancement of Learning and Assessment (CALA)'s definition of higher order thinking skills as skills achieved by individuals who work in environments that facilitate "persistence, self-monitoring, open-minded, and flexible attitudes" (King, Goodson & Rohani, 2009).

Today's learners are "do-it-yourself" learners (Nussbaum-Beach & Hall, 2012). Having acquired information from a series of nodes, connectivism describes learning as an informal opportunity that transforms learners into 'nodes' themselves, equally capable of sharing their knowledge and expertise with other individuals (Sangra & Wheeler, 2013). This principle is similar to constructivism's foundation by Jean Piaget, in which social and cultural interactions become triggering mechanisms for learning (Driscoll, 2005). Constructivism posits that learners learn from mediators including parents, instructors, peers, or even computer applications (Wertsch, 2008). Individuals, according to the constructivist's viewpoint, learn from these mediators just as learners, according to the connectivist's viewpoint learn from several series of nodes. While connectivism provides a useful lens through which teaching and learning using digital technologies can be better understood and managed, further development and testing are required

Thus, the focus of the was on knowledge construction, collaborative learning, and teaching, including the roles of teachers in scaffolding active lower primary learner participation, which cognitive constructivism theory is well-suited for this purpose. According to this theory, there is no single correct meaning of the world that children are trying to understand. Instead, there are many ways to structure the world and many meanings or perspectives for any event or concept (Duffy & Jonassen 1992). Cognitive constructivist models assume that the main objective of teachers should be to support learners in gaining experiences rather than aiming to transfer "knowledge objects" from the teacher to the learner (Säljö, 2014). Therefore, cognitive constructivist theorists have moved away from objectivist knowledge transmission models towards active learner models. Cognitive constructivism also considers the learner as an individual who learns in isolation from others (Edelson, Pea & Gomez 1996).

Therefore, the study was based on the theory of Cognitive constructivism by Jean Piaget, 1980. Constructivism theory had a broader lens and is grounded in wider learning mediators including parents, instructors, peers, or even computer applications (Wertsch, 2008). This aligned well with active learner participation promoted by one of the mediators of learning which in this study was digital teaching explained as digital devices, digital applications, and digital methods. Cognitive constructivism holds that people actively construct or make their knowledge and that reality is determined by the experiences of the learners (Elliott, 2000). In elaborating on cognitive constructivists' ideas Amineh, and Davatgari, (2015), stated that knowledge is something that is actively constructed by learners based on their existing cognitive structures brought by the interaction of prior knowledge and new events. Cognitive constructivist learning allows learners to develop their understanding of learning resources. This teaching method can help learners integrate new information into existing knowledge and allow them to make proper amendments to their existing intellectual frameworks

The study was based on the theory of Cognitive Constructivism by Jean Piaget in 1980. According to (Elliott, 2000), this theory states that people actively construct or make their knowledge, and reality is determined by the experiences of the learners. Amineh, and Davatgari (2015) elaborated on cognitive constructivists' ideas, stating that knowledge is actively constructed by learners based on their existing cognitive structures brought by the interaction of prior knowledge and new events. Cognitive constructivist learning allows learners to develop their understanding of learning resources. This teaching method helps learners integrate new information into existing knowledge and allows them to make proper amendments to their existing intellectual frameworks.

Hence, the study found that cognitive constructivism, which emphasizes knowledge construction rather than innate or passive learning, is well-suited for digital teaching in small groups of children. This approach encourages networking, teamwork, and collaboration, which contributes to positive active learner participation. As a result, learners form positive peer relationships, gain access to learning resources, attend lesson activities more frequently, and have a higher rate of school year completion ¹. Active learners play a key role in the mutual relationships and interactions between people and behavior and social environment motivated by digital teaching, which is relevant to this study topic (McLeod, 2019).

Cognitive constructivist theory suggests that the main duty of a teacher is to create a problem-solving atmosphere through scaffolding, where learners become active participants in their learning. From this perspective, a teacher acts as a facilitator of learning by using digital applications and methods. The teacher ensures that they understand the learners' pre-existing conceptions and scaffolds infant learners in the activity to address them and then build on them, which improves learner active participation characterized in this study as access, attendance, and completion. Scaffolding is where the teacher continually adjusts the level of their help in response to the learner's level of performance. In this study, scaffolding included the application of digital teaching pedagogies characterized by digital equipment, methods, and applications to model learners' pre-existing educational skills, providing hints or cues, and adapting material or activities that scaffold their active learning participation to access, attend, and complete the learning and educational cycle (Oliver, 2014).

As a popular instructional theory, the relevance of cognitive constructivism to this study is about encouragement to lower classes learners' participation through hands-on learning, and collaboration as adopted in the education domains for infant learners (Taber,

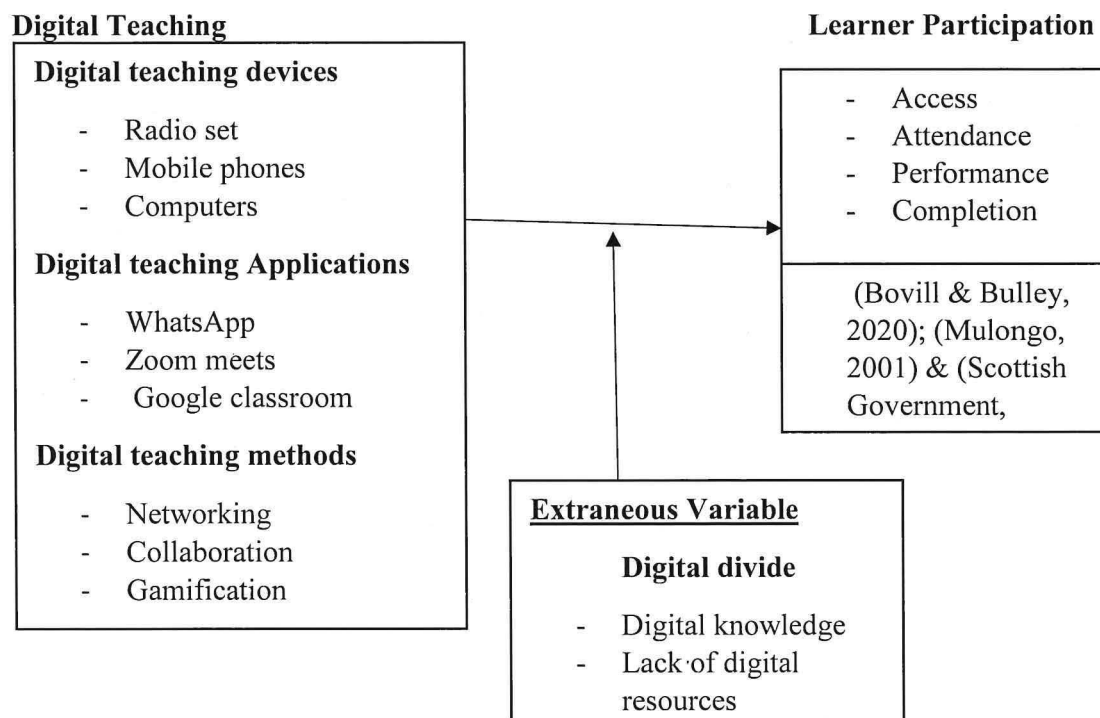
2020). Learner-centered approach have identified with online digital pedagogies which promote childrens strategic learning environment. Lower-class learners personally empower themselves to have access, attend, and complete educational cycles in a democratic way, also enabling them to gain meaningful learning in their phase (Gulati, 2021).

However, the biggest disadvantage of cognitive constructivism to lower-class learners in refugee schools who require highly structured learning environments to be able to reach their potential is its lack of structure. It also traditionally removes grading and instead places more value on learners evaluating their progress, which may lead to lower-class learners falling behind, as without standardized grading, teachers may not know which learners are struggling (Copple & Bredekamp, 2009).

Cognitive constructivism's central idea is that children's learning is constructed, and lower primary-class learners build new knowledge upon the foundation of previous learning. This prior knowledge influences what new or modified knowledge a learner will construct from new learning experiences (Phillips, 2017). This idea aligns with the purpose of this study on the application of digital teaching to promote learner participation in lower primary school classes, with related objectives of digital devices, applications, and methods that relate to prior knowledge by the learners to facilitate their meaningful participation during teaching and learning while in the classroom guided by the teachers.

2.2 Conceptual framework.

According to Grant, and Osanloo (2014), the conceptual framework is a structure that the study believed can best explain the natural progression of the phenomenon to be studied. It was arranged in a logical structure to provide a picture or visual display of how ideas in a study are related to one another. In this study, the conceptual work summarized logically the two variables under study: digital teaching, which is the independent variable, and learner participation, which is the dependent variable. This is shown in Figure 1 below.



Source: Adapted from Decenzo and Stephens (1998), Nairuba (2004), and Aguinis (2009).

Figure 2: Conceptual framework

2.3 Digital devices that enhance learner participation

Digital devices such as radios, televisions, smartphones, tablets, and computers are considered essential in bringing the world of education and other communities closer. According to Handal (2016), radio has long served as a popular medium of learner democratic participation in Guyana's classrooms for more than a decade. Radio technology was viewed as "old technology," yet it was used to deliver a new method of pedagogy for pupils to become more engaged in classroom instruction. The study by Traxler (2019) on the benefits of mobile phones on lower primary school learners in refugee communities is limited to increased access to educational services. Mobile phones enable learning that occurs across time and place as learners apply what they learn in one environment to developments in another (Sharples, Taylor & Vavoula, 2007). A substantial body of research has shown the benefit of television sets for lower-grade learners' active participation. Much of this research has been based on experimental studies in which children view specific programs. Less frequent are studies of children's learning arising from programs they choose to view, especially in refugee-hosting primary schools (Calvert & Kotler, 2012).

According to Sharples et al (2007), another study on mobile phones and learner participation in conflict settings showed the impact of informative outcomes which alter the character of education and learning as the mobile technology converges and facilitates new learner participation. Under the supervision of a common program between UNESCO and the government, telephones were used as a link between learners and teachers to enrich class participation (Emadi, 2019). Little was done to skill primary teachers in refugee hosting schools before being engaged in this new digital teaching technological method. In Guyana, specialists from the Education Development Center (EDC) have designed a single

Interactive program to meet the needs of Grades 1-3 pupils in the area of mathematics and are focused almost entirely on improving the quality of learning (Mackinnon & Mackinnon, 2010).

According to Sharples et al (2007), study on mobile phones as digital teaching devices that promote learner participation in conflict settings. It showed higher informative outcomes that alter the character of education and learning as mobile technology converges to facilitate new learner participation. Under the supervision of a common program between UNESCO and the government, telephones were used as a link between learners and teachers to enrich class participation (Emadi, 2019). Little was done to skill primary teachers in refugee hosting schools before being engaged in this new digital teaching technological method. In Guyana, specialists from the Education Development Center (EDC) have designed a single interactive program to meet the needs of Grades 1-3 pupils in the area of mathematics and are focused almost entirely on improving the quality of learning (Mackinnon & Mackinnon, 2010).

According to Marzano (2021), classrooms that provide all primary school lower-class learners with their laptops spend more time involved in collaborative learning compared to their non-laptop counterparts. Infant learners participate more with project-based instruction and produce writing of higher quality and greater length. They also gained increased access to information, improved research analysis skills, and spent more time doing homework on computers ¹. However, more studies are needed to focus on lower primary learners in emergency interaction with laptops, which has been less realized. In some instances, rather than transmitting instruction via live broadcasts, lessons are pre-recorded (onto CDs or in mp3 format) and are delivered with accompanying audio players within classrooms (Lisa, Andrea &, Bosch, 1996).

According to Rockman (2009), laptops and tablets used in refugee primary schools not only reinforced the utilization of successful learning strategies but also enabled lower-grade learners to transfer knowledge across disciplines in collaborative and participative networking through digital content games. The British government passed the “Children’s Computer Act 1990” into law, which defined educational programming as content intended to ‘further the positive development of the child in any respect, including cognitive/intellectual or emotional/social needs’. However, policy actions towards integrating this law into lower-level education systems were not prioritized.

Another study by Fisch (2019), on digital teaching gain and lower grade learning needs to be steered in Honduras showed the blend of tablet computers and other interventions which have synergistic effects on the active progression of children in their own education decisions. However, teachers’ role in supporting this act of learning needed to be targeted in this study.

The study by Li, and Guo (2020), have focused on digital radio sets as main promoters of lower school-level learner participation because most programs have carefully been designed and their result considered with some caution. This study showed the impact of viewing educational television as unhealthy either through delaying specific cognitive or academic skills. This as such leads to poor reasoning which demotivates modeling of behaviors likely to enhance academic performance. According to Baydar, Kagitcibasi, and Kuntay (2009), further said in other studies, digital teaching resources if not arranged according to the characteristics of lower primary class learners to achieve the intended goal of learning, can turn out to be for leisure, communication, digital storage facilities and music showrooms. But also, the need to explore the impact of these digital devices on lower

primary class learners' educational experiences in refugee hosting communities needs to be merited by studies to ascertain these facts empirically (AAP, 2016).

Digital devices such as desktop computers, laptops, digital cameras, mobile phones, tablets, and smart boards allow primary school learners and teachers in refugee settlements to participate in curriculum-oriented activities (Purcell, Buchanan, & Friedrich, 2016). When these devices are used effectively in the curriculum and instruction, they enhance learning in influential ways. These digital techniques can give not only primary learners and teachers advanced settings but also opportunities to reach primary sources of learning materials, utilize new methods to collect and record data, communicate, and share learning experiences with teachers, and most importantly, refugee community primary school learners. Moreover, learners can design and present their knowledge-appropriate content for refugee lower primary-class learners (Eady & Lockyer, 2013).

Some gaps exist to be addressed by this study on the usage of these good educational digital teaching devices to improve lower primary school learner's pre-literacy and literacy skills including active lesson activity participation (Bachrach, 2010). Again a gap evidenced by the study conducted in refugee high schools on digital teaching by Haniya (2021), focused on understanding digital teaching and active students' participation on large-scale digital devices such as massive open online classes in Bidibidi, Yumbe district. Simple child-friendly digital teaching devices such as those mentioned in this study remained undiscussed to cause learning, despite their cognitive benefit on school readiness and academic achievement as indicated by the cognitivist theory applied in this study (Baran, 2014). A complete attempt to find similar studies on digital devices in Bidibidi refugee primary schools yielded no results.

2.4 Digital teaching applications that promote learner participation.

According to Lai (2016), WhatsApp has been investigated for its use in vocabulary building and found a significant correlation between lower grade level learner's chat and vocabulary gain. Andujar (2016) examined the use of WhatsApp interactions on learners' participation in writing skills and found that there were differences between the control group and the experimental group. In Malaysia, WhatsApp is a popular social media for children's learning, just like their higher-level counterparts.

Burnett and Merchant (2014), and Haverback (2009) observed and examined how lower primary learners' activities within the Facebook community are motivated by Zoom meeting online classes in refugee school settings. The activities they observed included how lower-class learners discuss their assignments, ask and answer questions, post information, and support each other for their Reading Education Methods course. They found that lower primary class learners are motivated to be involved in Zoom meeting application discussions with a better understanding of the theoretical principles of effective communication ¹. In another study, sixty-one pre-primary completers and twenty in middle classes took part in a study using the Movie Maker software. Their tasks were to watch tutorial activities on materials learned in class, and thereafter upload finished movie tutorials to the Internet-based website. The results showed that the Zoom meeting tutorial had a significant positive effect on perceived active infant class learning (Fralinger & Owens, 2009).

Chao, Chiu, Dejaegher and Pan (2016), found that when lower primary school learners used Zoom meetings for educational purposes such as recording audio information, checking to see what friends are up to, and sharing information (sharing links), it results in a positive academic outcome better than when they used it merely for socializing such as status update and chatting. There is also a positive effect when lower primary class learners

in refugee hosting schools contact or visit their teacher's website, lower primary class learners viewing their teacher's website, reflect a high level of motivation, effective learning, teacher credibility, and positive attitudes towards the course and the teacher which enhanced active lower grade learner participation (Mazer, Murphy, & Simonds, 2009). Therefore, lower primary school learners are observed to believe that Zoom meeting applications and similar social networking sites could support active classroom participation (Roblyer, McDaniel, Webb, Herman, and Witty, 2010).

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According to Childers, and Jones (2015), and Henry (2012), Google classrooms have been investigated for teaching lower primary learners' participation in various disciplines such as literacy and English plus foreign languages in refugee primary schools. In lower primary classes, Clifton and Mann (2011) found that the use of Google Classroom programs increased learner's engagement, and critical awareness, and facilitated deep learning.

Furthermore, Clifton and Mann (2011) said videos could be accessed at any time of the day and from any place to suit basic children's education. Apart from that, Google Classroom is also used to illustrate children's theoretical content, involve learners, and inspire innovative children's brains through E-learning teaching methods. Thus, the development of good reading practices in refugee-hosting schools' teaching and learning environments can be seen better when pupils work in Google digital classroom groups rather than when they read individually (Agazio & Buckley, 2009).

Choi, Hand and Norton-Meier (2014), and Kelsen (2009) reported that Google classroom videos improved primary active participation in teaching and learning in various disciplines in refugee primary schools. The importance of using videos in teaching becomes more apparent among the lower primary class learners in emergency communities, as it serves as face-to-face teaching, which is not achievable at most times. Google Classroom has become a very important supplementary platform mostly for lower-class learners in Taiwan. A survey of 69 sophomore lower primary school learners found that they rated the use of Google Classroom to study English favorably about it being interesting, relevant, and beneficial.

According to Chipunza (2013), WhatsApp allows learners in pre-primary and lower primary school grades to express their ideas and knowledge in a non-restricted learning environment. However, at times lower primary class learners need to consult the teachers on certain issues to scaffold better learning ideas gained from digital platforms. Cases where teachers are unreachable mean learner's participation may not be meaningful to the learning goal. The role of teachers as a facilitator was certainly evident in the interactions when they were not able to decide on certain issues. Vural (2013) also indicated that there seemed to

be a lack of enough research conducted on the use of videos in Google Classroom to promote learner participation in refugee lower primary school learners. In the Malaysian context, studies have addressed the role of Zoom classrooms in the educational context in general (Mistar & Embi 2016).

The proposed disadvantage of digital teaching applications is not about enhancing primary school lower class learners' participation in refugee primary schools, but rather the lack of qualitative studies that address the learners' reflections and views, particularly in Uganda refugee schools where blended teaching is most wanting to address the context-specific challenges highlighted in the background of this study. Nevertheless, digital applications promote active participation of lower primary class learners, such as the use of Twitter, Blogs, Wikis, Zoom, YouTube, and Google Classrooms, and other applications can be used to engage and instruct assessment for learning. Lower primary school learners and teachers are anticipated to be connected to these platforms all the time to learn at their own pace. However, limited conclusive studies have addressed the major gaps in teacher knowledge and digital application preference in Bidibidi refugee schools (Evans, Lopez, Maddox, Drape, & Duke, 2014). WhatsApp constitutes a powerful educational tool to encourage second-language interaction among learners and its tremendous potential to activate learners' involvement (Abe & Jordan, 2013). Yet studies to empirically prove WhatsApp as one of the teaching and learning tools in primary as well as in lower primary classes in the refugee context were yet unclear.

2.5 Digital teaching methods that promote learner participation.

Marsteller and Bodzin (2015) and Lennon, Maurer and PEW (2003) conducted a study on the impact of digital networking and learner participation in primary and secondary schools,

using Green Springs School in Lagos State, Nigeria as a case study. The study showed that most learners agreed that digital networking helps lower-grade learners to have access to an unlimited source of information, reveals connections between subjects, promotes critical thinking, and encourages ways of learning. Digital networking methods have increased learner enrolment, access, retention, and completion in some lower primary schools in Yumbe (War Child Holland, 2012). This was further pointed out as differences in digital networking methodologies and learning channels on lower primary children's participation between traditional teaching and digital teaching today, with more focus on refugee school-going children remain unclear in this study (McKiernan 2011).

Faja (2013) stated that virtual collaborative activities had the potential to keep learners engaged, create a sense of community in online lessons, and allow both the teacher and the children in grade three levels to participate, experience, and practice virtual teamwork skills. Another study by Pringle, Dawson, & Ritzhaupt, (2015), and Lee (2021), showed that digital collaboration had enhanced online team activities which seem to answer active lower primary learners' participation. Collaborative virtual teaching in an online classroom can take the form of discussion among the whole class or team activities within smaller groups. Another categorization of collaborative activities classified them as those processes-oriented and actively engaged teaching and learning that is creative to teaching teaching (Wilkerson-Jerde Gravel, & Macrander, 2015).

According to Szegletes (2015), a study on the effects of digital gamification on primary school class learners' engagement and participation in social studies in an international school in China showed that digital teaching methods provided opportunities for teachers to differentiate instruction in ways that were made simple and feasible for infant learning. Gamifying instructions in teaching often requires learners in lower primary classes

in refugee schools to learn by engaging in new literacies through the intermittent use of computers, laptops, and mobile devices(Hoe, 2015).

Gamification has a significant relationship with lower primary active lesson activity participation and engagement in learning, and therefore, has a positive impact on learning achievement, as explained by Alsawaier (2018). Chan (2017), Dichev and Dicheva (2015), Szegletes (2015), and Sepehr and Head (2013) all noted that digital gamification as a method of teaching contains some form of elements that attempt to give a boost to lower primary school learners which addresses learners' needs through rewards, points, levels, options, and badges. Hoe (2015), stated that gamified lesson activities promote learners' participation. Thus, allowing learners to acquire knowledge anywhere which fosters positive traits through specifically for academic careers.

According to Orlando and Attard (2015), teaching with technology is not a one-size-fits-all approach to achieve learner participation as it depends on the types of digital teaching technologies used at the time and also the curriculum content being taught. Online collaborative learning may delay class participation, and development stages, taking longer to get to know the group members or reach agreements with infant learners (Zheng, Warschauer., Hwang and Collins, 2014). A report on lower primary classes by Xiang and Passmore (2015), found the online group activity to be time-consuming and frustrating. Its controversy routes around education system that created inequalities of social and intellectual capital rather than equal and quality learning all levels of learning including in refugee schools (Xie, & Reider 2014). The statement further stretched that effective digital teaching methods have many variables that may affect infant learners' participation, but also with no agreed-upon definition of digital pedagogies. According to a study by Wilkerson-Jerde, Wagh and Wilensky (2015), indicated that there was no clear suggestion that

measured effective digital collaboration methodology used to promote learner participation, especially in primary schools for lower primary classes.

According to Dixson (2010), numerous best digital practices suggest how teachers should engage with lower primary school learners in online discourse. However, there was no positive motivation about learners' attitudes and perceptions of some best practices that include using small digitized discussion game groups, rapport, and trust-building collaboration learner-led discussion networks. Nevertheless, results of the study by Xie and Reider (2014) on these areas of digital learning pedagogies that promote lower primary learner participation suggest that learners are more satisfied with their online digital pedagogies experienced when such methods are implemented in primary schools. The field of education utilized digital pedagogies to involve and inspire learners through drill and practice, planned activity, and problem-solving. A study by Chan (2017) showed that "meaningful learning" occurs when learners build upon personal, unique pre-existing knowledge to solve new problems through digital pedagogies.

In summary, the above literature evidenced the existence of digital teaching technologies that are applicable in the attainment of Education For All and SDG 4. Coupled with Cognitive constructivism theory with a notion that learners' paradigm own knowledge through hands-on interface, and networking besides hyperactivity (Moomaw, 2013). These identified literature gaps around knowledge, scope, time, and content were a clear justification for a need for this study on "digital teaching and learner participation" in lower primary school classes in the Bidibidi refugee settlement, Yumbe district.

CHAPTER THREE

METHODOLOGY

3.0 Introduction.

This chapter focused on the methodology used for conducting the study. It explained the paradigm which guided the study, the research approach, and the research design. The population, sample size of the study and sampling techniques were described. The use of methods and data collection instruments were elaborated. The reliability and validity of the instruments were discussed. The chapter further explained the exclusion and inclusion criteria, data collection procedures, data analysis and ethical considerations

3.1 Research design.

The study utilized a descriptive cross-sectional survey design of a quantitative research approach. According to Yin (2014) and Swami (2011), this design is an investigative study that involves gathering data directly from a population at a particular time without influencing the population. The descriptive design was ideal for this study because it allowed for direct responses from the participants while examining the existing phenomenon of “digital teaching” thoroughly without manipulating the study variables. The design also allowed the participants to describe and provide their opinions regarding the variables being studied in detail. The design also allowed data collection using the predefined methods that were selected.

3.2 The location of the study.

The study was conducted in the Bidibidi refugee settlement located in the Yumbe District of North Western Uganda. The settlement, which was opened in 2016, spans an area of approximately 250 square Kilometers and hosts up to 272,206 refugees. This is more than

the host population of 221,300 people, leaving existing services under-resourced. As a result, Bidibidi is currently the largest refugee settlement in Uganda (UNHCR, 2019).

3.3 Study and target population.

3.3.1 Study population.

The study population involved the headteachers, lower primary school class teachers, and learners in lower primary school classes in Yumbe district, Bidibidi refugee settlement.

3.3.2 Target population.

The study targeted 91 lower primary school class learners, 30 teachers, 10 head teachers in the selected schools in Bidibidi, and 2 OPM officials in the Bidibidi refugee settlement command office. The participants were selected based on their role in digital teaching and learner participation in primary schools in the Bidibidi refugee settlement.

3.4 Selection of participants.

3.4.1 Inclusion criteria.

The study only comprised the sampled lower primary school pupils, sampled lower primary school teachers, head teachers, and OPM officers who consented to participate in schools at least with digital devices and facilities applied in classroom teaching.

3.4.2 Exclusion criteria

The study excluded sampled participants who did not consent to participate in the study, and teachers of upper primary classes in the selected schools, teachers in primary schools who were not under study.

3.5 Sample size determination.

3.5.1 Sample size.

While the larger the sample the lesser the likelihood that findings were biased does hold (Gill, 2010). Considering the margin of error of 5% in educational research, a 95 percent level of confidence implied that 95 out of 100 samples the true population value within the margin of error (E) was specified (Alison, 2019). The National IT survey by UBOS 2019/2020 found that the West Nile sub-region had an average household ICT ownership and usage of 24.45 % with radio sets, 31.4%, Television sets, 4.6% computers 2.2%, and telephone 59.7%. Hence, considering the average rate of 24.45% (UBOS, 2020). The sampling size for this study was computed using the standard sample formula below;

$$n = \frac{Z^2}{d^2}.$$

Where n is the sample size, Z is the constant at 1.96, P is the average prevalence rate for digital devices which stands at 24.45% (0.2445), q is 1-P and d is the margin of error of 0.05. When computed, it meant that this study's sample size was 289. However, a sample size of 133 out of 289 was considered based on Krejcie and Morgan's (1970) sampling guidelines. He contends that a sample size larger than 30 or less than 500 is appropriate for most studies. In this study, the sample size of 133 participants was considered sufficient. This is described in Table 1, below.

The larger the sample size, the lesser the likelihood that findings were biased. However, diminishing returns can quickly set in when samples get over a specific size, which needs to be balanced against the study resources (Gill, 2010). In educational research, a margin of error of 5% implies that a 95% level of confidence is required, which means that 95 out of 100 samples have the true population value within the margin of error (E) specified (Alison, 2019).

According to the National IT survey by UBOS 2019/2020, the average household ICT ownership and usage in West Nile sub-region in Uganda was 24.45% for radio sets, 31.4% for television sets, 4.6% for computers, and 59.7% for telephones. Based on the average rate of 30.04%, the sample size for this study was computed using the standard sample formula below:

$$n = (Z^2 * P * q) / d^2$$

where n is the sample size, Z is the constant at 1.96, P is the average prevalence rate for digital devices which stands at 30.04% (0.3004), q is 1-P, and d is the margin of error of 0.05. Based on Krejcie and Morgan's (1970) sampling guidelines, which contend that a sample size larger than 30 and less than 500 is appropriate for most studies, a sample size of 133 participants was considered sufficient for this study.

Sampling Criteria	Sample Size
Total population	272,206
Margin of error	5%
Confidence level	95%
Sample size	133

Therefore, the table 1 below shows further sample size and techniques

Table 1: Participants, size, and sampling techniques

Category	Population	Sample size	Sampling technique
Headteachers	10	10	Purposive non-random sampling
OPM Commandant and OPM Education officer	6	2	Purposive non-random sampling
Lower primary class teachers	60	30	Stratified random sampling
Lower-class learners in P1-3	3,810	91	Stratified random sampling
Total	3,882	133	

Note: Krejcie and Morgan (1970) Determining Sample Size for Research, & UBOS, (2020).

3.5.2 Sampling techniques.

a) Sampling of the head teachers.

This study used a purposive sampling technique to intentionally select 10 head teachers from the 10 selected schools to participate in the study. This technique allowed for choosing participants based on their specific characteristics or qualifications relevant to our research, ensuring a targeted and representative sample for the study.

b) Sampling of the Commandant and Education officer.

One OPM Commandant and one OPM Education Officer were also selected purposively to participate in the study. This was based on the role they play as the most high-level government authorities with oversight and coordination function of education systems and other education ecosystem services in the Bidibidi refugee settlement

c) Sampling of the lower primary class teachers.

The study applied stratified simple random sampling to select 30 teachers in 10 schools for this study using the following steps. The study 30 lower primary school teachers in each of the 10 schools. The lower primary school teachers were stratified by school. A unique identifier (numbers from 1 to 100) was assigned to each of the lower primary school teachers in the 10 schools through each head teacher. Using a random number generator, we selected 3 lower primary school teachers from the 10 selected schools to meet the total sample size of 30 lower primary school teachers. Based on the random numbers generated, the study chose the lower primary school teachers corresponding to those numbers. The study verified and contacted the selected lower primary school teachers in the 10 schools. This technique was used because it provided each lower primary school teacher an equal chance of being selected, ensuring fairness and reducing potential bias in the sample.

d) Sampling of the lower primary school class learners in P1-3.

The study applied a stratified simple random sampling technique to select 91 pupils from three classes (P.1 to P.3) in 10 schools, whereby, the study identified the total number of pupils in each P1-3 and divided them into strata based on their school and respective classes (P.1, P.2, P.3). This stratification ensured that each school and class was represented in the sample. In this case, the study had 10 schools and 3 classes. The study calculated the proportionate sample size for each stratum based on the desired total sample size of 91 pupils. 9 pupils from 9 schools and 10 pupils from 1 school was the desired sample size. The selected pupils were given separate time with the teachers to apply digital teaching to the lesson activity.

The study further verified and double-checked the selected pupils by checking the pupils' exercise books and class registers to ensure there were no duplicates or errors.

3.6 Data collection.

Quantitative and qualitative data which was collected using a questionnaire, interview and observation methods. Firstly, quantitative data was collected using questionnaires and then interviews and observation were conducted to give a clear understanding of the qualitative to triangulate better the understanding of the existing situation on digital teaching and learner participation among the lower primary school learners in Bidibidi.

3.6.1 Observation method.

The study involved non-participant observation, where the study was able to take note of various aspects that described digital teaching and learner participation. Direct observation was very useful as the study was undertaken in its natural setting, which in this case was school classrooms. The use of observation helped to prove the details given from other data collection methods (Creswell, 2018). In this study, observation involved a keen look at digital teaching devices, applications (apps), and methods that were applied in teaching in lower classes to promote learners' participation in lesson activities.

3.6.2 Interview method.

Whereas structured interviews chosen for this study lacked richness, and variation among the participants, the interview was controlled to obtain comparable information rightfully from interviewees. The study had pre-planned written interview items which ensured flexibility. Such a format was an effective way to keep the interview tightly focused on the target topic, which in this case was "digital teaching and learner participation" (Bryman, 2011). This method was selected for obtaining data on the study topic from the key

informants who were; the primary school head teachers and education officers from OPM in Bidibidi. This study used physical interviews since it allowed for probing to ensure interpretations.

3.6.3 Questionnaire method.

According to Young (2016), a questionnaire should bring out the study questions and hypothesis. Thus, in this study, the 5-point Likert Scale was set as; Strongly Disagree, Disagree, Not Sure, Agree, and Strongly Agree. Since the study design was quantitative, a structured questionnaire method that was concerned with numbers such as “how many?”, “how often?”, and “How satisfied?” were required. The study adopted the questionnaire method because at least all participants were literate.

3.7 Research tools.

3.7.1 Observation checklist.

This tool was used to determine the participation of lower primary school learners in class activities while using digital teaching techniques. The lower primary school learners were observed covertly while they were in for class activities at school. An observation checklist was used to note learners’ participation during digital teaching.

3.7.2 Interview guide.

According to Kothari (2004), an interview guide is an oral questionnaire where the study gathers data through direct verbal interactions with the respondent. This was used to collect data through face-to-face physical interaction with 10 head teachers and 2 other key informants (OPM Commandant and OPM education officer). A key informant interview guide with open-ended questions on the topic of “digital teaching and learner participation”

was used to conduct these interviews within a span of one week between 9:00 AM and 3:00 PM

3.7.3 Questionnaire guides.

This questionnaire was used to obtain the perception of lower primary school teachers regarding digital teaching. It contained structured items including; Teachers' demographic information, digital teaching, and learner participation constructed from the objectives of this study. The questionnaire items in this study were rated on a 5-point Likert Scale with the following values: 4.21-5.0 (Very high), 3.41-4.20 (High), 2.61-3.40 (Moderate), 1.81-2.60 (Low), 1.00-1.80 (Very low). The tool was self-administered by the study to the sampled lower primary school teachers selected from the 10 selected schools. The teachers were given 2-3 days to complete the questionnaires before the study collected them. A questionnaire was a wisely designed tool for gathering data by the provisions of the research questions and hypothesis (Young, 2016).

3.8 Standardization of tools.

3.8.1 Validity.

Content validity is a measure of how well an instrument, such as a survey or test, covers all relevant parts of the construct it aims to measure. The study utilized triangulation which ensured that the validity of research findings before the administration of the research instruments was thorough. A research expert checked the instruments afterward

To determine content validity, the study ensured that the instruments were fully representative of what it aimed to measure through the following steps:

1. Data was collected from 10 subject matter experts (SMEs) who were involved in the research experts and lecturers were reached as in the best position to evaluate the content of this study instrument.
2. The SMEs were asked to evaluate each item on the instrument and determine whether each item targets characteristics that the instrument was designed to cover.
3. Then the study calculated the content validity ratio (CVR) for each instrument using the following formula:

$$\text{CVR} = (ne - N/2) / (N/2)$$

where:

- ne is the number of SMEs who rated an item as essential
- N is the total number of SMEs

$$\text{CVR} = (9 - 10/2) * 10/2 = 0.9$$

According to Amin (2020), a content validity index of 0.9 and above qualified the instrument for the study. Hence, this study proceeded using the set items in the tools, which were considered standardized for this study.

3.8.2 Reliability.

Cronbach's (1951) alpha coefficient is a measure of the internal consistency, or reliability, of a set of survey items. It is used to determine whether a collection of items consistently measures the same characteristic.

For this study, the data was collected from 3 developed tools from at least 10 similar participants and tested using the SPSS. The data analyzed by SPSS was based on the four variable items to determine the reliability of the tools:

1. Item 1 – Digital teaching devices
2. Item 2 – Digital teaching applications (digital apps).
3. Item 3 – Digital methods.
4. Item 4 – Learner participation.

Since some survey questionnaire items used a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), the statistical software calculated the overall Cronbach's alpha. Then it recalculated the statistic after omitting each item because that process can provide valuable information about specific items.

The overall Cronbach's alpha was 0.7853. This value is minimally acceptable by most standards, which means that the study was considered using these tools as reliable. Since Cronbach's alpha ranges from 0 to 1, with higher values indicating higher agreement between items, a value greater than 0.7 was generally considered acceptable for most research purposes. Hence, these research instruments were considered reliable as standardized for the study (Tavakol & Dennick, 2011).

3.9 Data processing and analysis.

The study used both qualitative and quantitative techniques for data analysis. Quantitative analysis was used to interpret numerical data while qualitative analysis was used to interpret non-numerical data.

In this study, data collected through questionnaires was administered, coded, sorted, categorized, and fed into the computer using Statistical Package for Social Sciences (SPSS) version 16.0 (Kothari, 2019). The data was scrutinized using frequencies, percentages, means, and standard deviation. Regression analysis was also used to predict the relationship between independent and dependent variables. A positive relationship between variables meant there was an impact of digital teaching on learner participation, while a negative correlation implied negative relationships.

According to Amin (2020), qualitative data collection techniques involve conducting face-to-face sessions between key informants where all conversations are recorded in a book. In this study, the interview content was reviewed, and only extracts with relevance to the study were presented in a narrative statement or themes, which are placed in quotes and used to supplement the quantitative data obtained from the questionnaires. Interview questions were arranged according to objectives and content scope, and they were interpreted and explained.

According to recent research by Monique Hennink and Bonnie Kaiser (2022), data saturation can be achieved with fewer participants than previously believed. Their review of 23 peer-reviewed articles suggests that 9–17 interviews or 4–8 focus group discussions can be sufficient to reach saturation, especially for studies with homogenous populations and narrowly defined objectives. The findings of this study agreed with qualitative interviews conducted with participants in this study. The approach of code frequency counts was applied, which involved counting codes in successive transcripts or sets of transcripts until new code frequency diminishes, signalling the reach of saturation. This was added by the code meaning approach, which was also used to focus on reaching a full understanding of

issues in data as the indicator that you've achieved saturation by assessing whether the issue, its nuances, and dimensions are completely identified and understood.

However, other variables may have affected saturation, such as the quality of recruiting, the overall focus of the study objectives, and how the questions are set. This was also taken care of by ensuring that the study understood saturation before discovering its role in effective qualitative research.

Table 2: Data analysis procedures

No	Objective	Analysis
1	Digital teaching devices	Content analysis; was utilized to list, transcribe, and edit to quantify and tabulate types of digital devices identified to improve learner participation thematically
2	Digital teaching application	Inferential analysis; involves objectively and quantitatively summarizing the data, determining which data patterns are significant, and making inferential statements about digital teaching applications that enhance learning in lower primary classes.
3	Digital teaching methods	Regression analysis; was used to relate, analyse, and present figures to predict how digital teaching methods promote learner participation

3.10 Ethical considerations

According to Resnik (2011), ethics are norms that distinguish between acceptable and unacceptable behaviors. He adds that they are methods, procedures, or perspectives for deciding how to act in a particular event. An introductory letter from Kyambogo University was delivered to the head teacher, which was required before the study interacted with respondents then the study was given permission. Before reaching out to selected schools with the introductory letter, the Settlement Commandant Bidibidi had to first authorize the study to be undertaken in the selected schools. A written consent letter orienting the participants about the purpose of the study was issued. The consent letter further described the research procedure, its purpose, risks, and anticipated benefits for them to give informed consent and assent. However, only the willing participants were involved. The study ensured that the anonymity of the identity of the participants was safeguarded by the use of numbers. About confidentiality, participants were informed at the beginning and assured, such as not indicate their names or any personal details that could reveal their identity. Pseudonyms were used for schools to strengthen the confidential aspects of the research and participants were offered the opportunity to ask questions or to withdraw from the research at any time.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0 Introduction.

This chapter presented data and discussion of results. This study is intended to assess the application of digital teaching to promote learner participation in lower primary school classes in Bidibidi refugee settlement, Yumbe district. The findings presented below begin with a discussion of the demographic information before proceeding to the presentation of three sections informed by the research objectives.

4.1 Socio-demographic information.

The data discussed in this section were based on the responses obtained from the field findings on social demographic physiognomies of participants which include; gender, age of respondents, work experience, and education level. The composite bar graph summarized the results of the findings as represented in Figure 2 below for the 42 adult participants and Table 3, detailing the learners' information by gender and class.

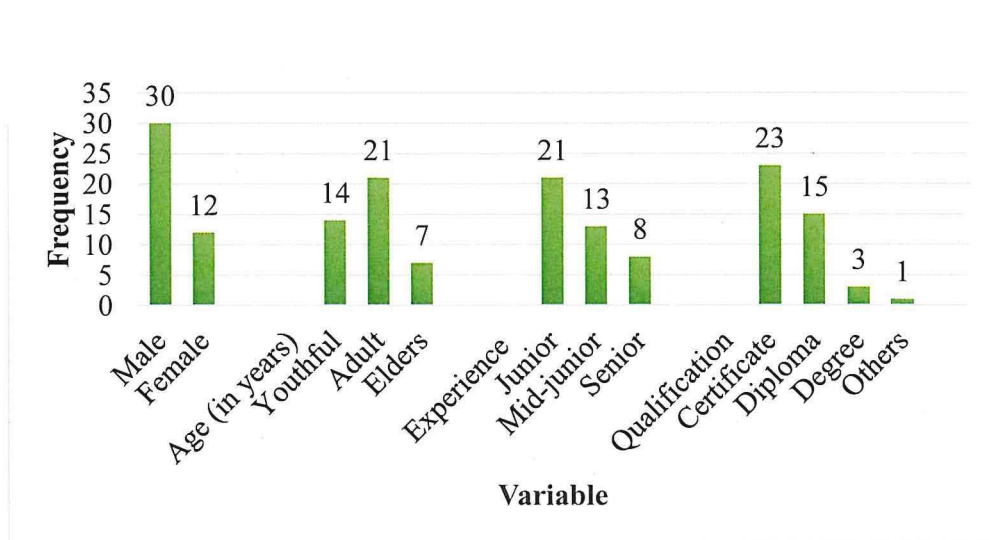


Figure 3: Socio-demographic information

Figure 2 revealed that there were more male participants at a frequency of 30 (71.4%), as compared to female counterparts with a frequency of 12 (28.6%), representing 33.1%. This showed that the study reached more male participants than the female. This was partly explained by the fact that male participants are more willing to attend (learners) or teach (teachers) in refugee primary schools than female counterparts.

The demographic figure indicated that there were more participants in the adult age category of 36-50 years at a frequency of 21 (50%), while there were fewer participants in the elder category of 50+ years at a frequency of 16.6%. This result was partly explained by the fact that the age 36-50 years want freedom to work independently anywhere, while the age 50+ years are reserved or are prepared to attain early retirement.

On the other hand, it showed that there are more teachers with junior teaching experience of 0-9 years at a frequency of 23 (54.8%), while teachers with senior experience of 20+ years in a teacher were fewer at a frequency of 8 (19%). This meant that there were more teachers in refugee settlements with less teaching experience. This could be because

most teachers with higher teaching experience have preferred teaching elsewhere with better services.

Finally, the figure showed that most adult participants had teaching certificates in Grade three teachers' education at a frequency of 21 (50%), while few teachers had degrees in education at a frequency of 3 (7.1%). It means that more teachers in refugee primary schools have grade three teaching certificates.

Table 3: Distribution of learners by gender in P1-P3 classes

Class	Boys		Girls		P value
	Frequency	percentage	Frequency	percentage	
P1	14	46.6%	16	53.4%	0.333
P2	15	50%	15	50%	
P3	16	51.6%	15	48.4%	

Table 3 indicated that 45 boys represented 49.4% and 46 girls represented 50.6%. This meant that the study reached an equal number of learners by gender in both classes. Since the P-value for all three classes is greater than 0.05, it meant no difference between the number of boys and girls in each class

4.2 Digital devices that improve learner participation.

This objective was set to determine the digital teaching devices that aid learner participation in lower primary school classes in Bidibidi refugee settlement. The responses for this objective were obtained from 30 teachers, 91 learners, and 10 head teachers plus 2 key informants. To begin with, the responses of 30 teachers who were reached were summarized in Figure 3, according to 4 variables which include; gender, experience, qualifications, and age categorization

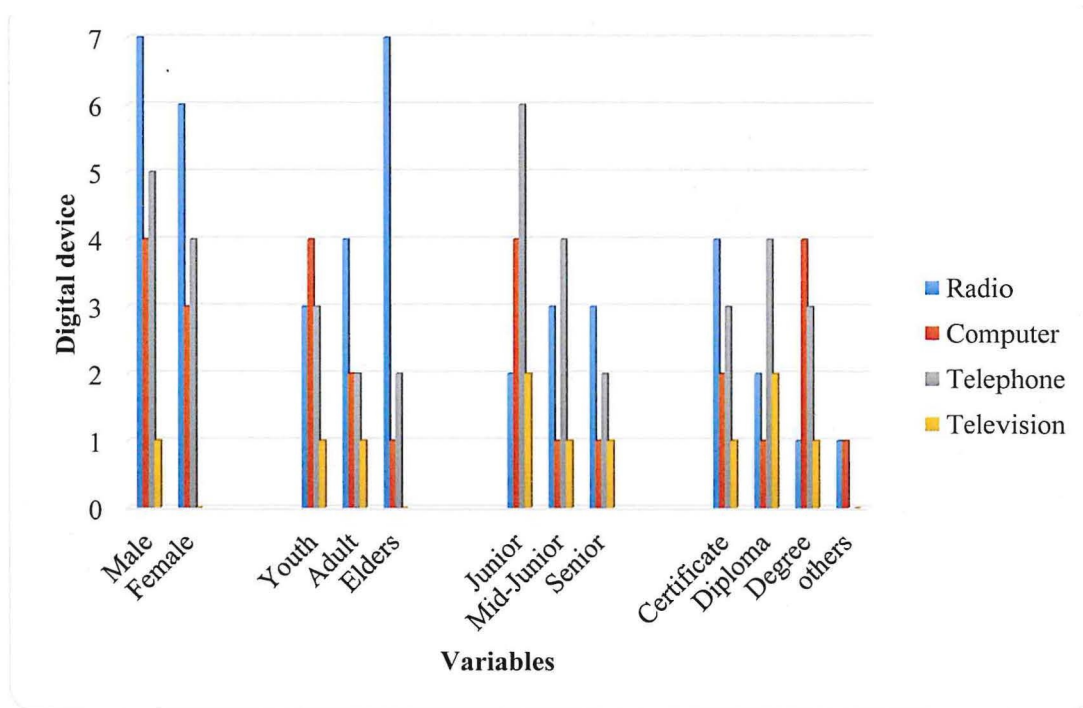


Figure 4: Digital teaching devices as given by the teachers

Figure 3 revealed that 7/30 male teachers preferred radios as a means of teaching in lower primary school classes as compared to their 6/30 female counterparts, with only 1/30 male and none of the female teachers preferring television. When it came to age categorization, 4/30 youthful teachers preferred using computers for teaching as opposed to 4/30 adult and 7/30 elder teachers who preferred radios, with age categorization, we observed 1/30 youthful, 1/30 adult and no elder teachers respectively preferring to use televisions. In regard to the experience categorization of teachers, 6/30 junior and 4/30 mid-junior teachers preferred to use telephones while 3/30 senior teachers preferred radios. With regards to qualifications, 4/30 teachers with certificates preferred radios as digital teaching devices in lower primary school classes as compared to 4/30 diploma teachers who preferred telephones and 4/30, degree teachers preferring computers.

Overall, Figure 3, revealed that whereas all the digital teaching devices under study were preferred by the teachers at every level of variance, radios were found as the most preferred digital teaching devices at an average percentage of 36%, while televisions were the least preferred digital teaching devices cross all the variables under study at an average percentage of 11.6%. More teachers had access to digital radios as compared to any other digital devices under study.

To verify this information, we had to observe 91 learners drawn from all the 10 schools and the results were summarized in Table 4.

Table 4: Digital devices as observed by the learners

Digital devices	Can recognize		Cannot recognize		P value
	Frequency	percentage	Frequency	percentage	
Digital radios set	45	49.4%	46	50.6%	0.223
Computers	15	16.5%	76	83.5%	
Telephones	20	21.9%	71	78.1%	
Others: Televisions	2	2.1%	89	97.9%	

Table 4, shows that the highest number of digital devices that can be recognized by learners was at frequency 45 for digital radio sets, which accounts for 49.4% of the total number of devices in this category. The lowest number of digital devices that can be recognized were frequency 2 for televisions in the "Others" category, which accounts for 2.1% of the total number of devices in this category. Since the P-value for all three classes is greater than 0.05, it meant no difference between the digital devices observed and those not observed among the learners in all the three classes.

On the other hand, the highest number of digital devices that cannot be recognized were of frequency 89 for televisions in the “Others” category, which accounts for 97.9% of the total number of devices in this category. The lowest number of digital devices that cannot be recognized in the frequency 15 for computers, which accounts for 16.5% of the total number of devices in this category.

This result agreed with that of the teachers, who gave the same reason that “learners recognized radios as learning devices as compared to other devices”. This could be because radios were the most available digital devices in schools and surrounding communities under study.

The 10 head teachers plus the 2 key informants in their interviews agreed that radios were the most preferred digital devices than any other device. They gave some reasons why radios were preferred as indicated in the following excerpt:

“radios are available and reliable to both teachers and learners in refugee schools and their communities, it is simple to use, it attracts learners’ attention to listen, promotes listening skills acquisition which is the basis of lower primary education....” (Headteacher zone 1).

Another head teacher agreed that radios, as compared to computers were easily used for different reasons as explained in the following excerpt:

“radios are easy to use, cover large areas, /cheaper to afford...” (Headteacher zone 2)

Also, a participant said in an interview that;

“telephones, smartphones are mostly used for making voice calls, on WhatsApp and doing personal communications plus entertainment by teachers and other adults...” (head teacher zone 1)

Another participant said in an interview that the reason why computers were listed as used was because;

“computers like laptops require complete training to be able to operate them, and few schools in the settlement have received any computer donation or training for it is teachers directly, teachers who know how to operate computers have been trained at the college before qualifying....” (Education Officer OPM)

In summary, radios were more observed as digital teaching and learning devices compared to computers, televisions, telephones, smartphones.

4.3 Digital teaching applications that enhance learner’s participation.

The second objective under study was set to describe how digital teaching applications enhance learner participation in lower primary school classes in Bidibidi refugee settlement. These results were recorded from 30 teachers, 91 learners, and 10 head teachers plus 2 OPM officials as shown in Figure 4 below.

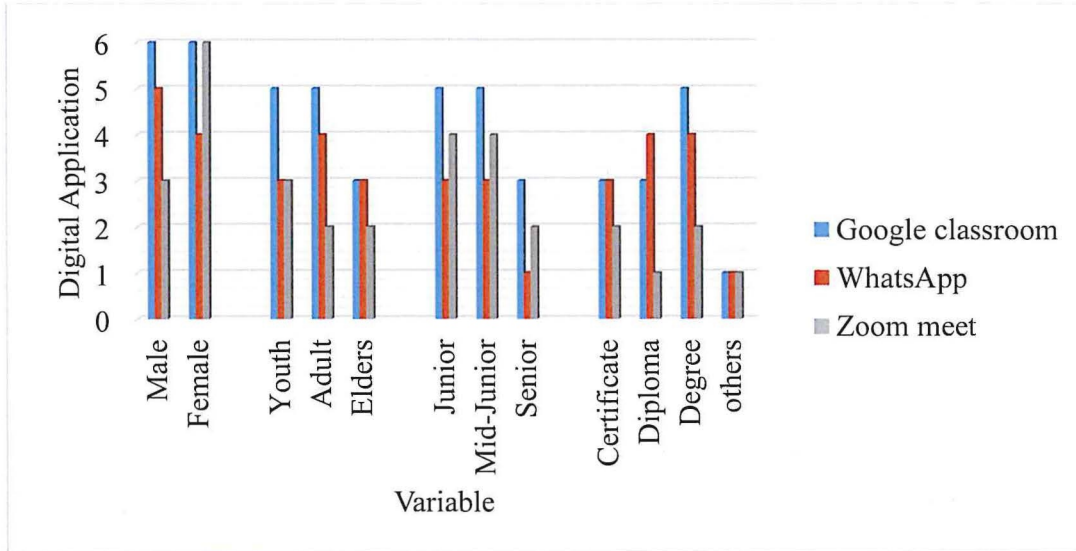


Figure 5: Digital applications as given by the teachers.

Figure 4 above, presented a frequency of 6/30 male and female teachers preferred to use Google Classroom for teaching lower primary school learners while Zoom Meet was less preferred by male teachers with a frequency of 3/30 as female teachers preferred WhatsApp digital application with a frequency of 4/30. With regards to age, results still revealed Google Classroom was more preferred by both youthful, adult, and elderly teachers at a frequency of; youthful teachers 5/30, Adult teachers 5/30, and elderly teachers 3/30, while Zoom Meet was listed as preferred by both teachers at frequencies of 3, 2, and 2 out of 30 respectively.

With regards to experience categorization, both junior, mid-junior, and senior teachers preferred Google Classroom at frequencies of 5/30, 5/30, and 3/30 respectively, while WhatsApp was listed as preferred by both teachers in this categorization with frequencies of 3/30, 3/30, and 1/30. When we looked at the teachers' qualifications, the digital applications preferences varied with the level of qualifications, as certificated teachers preferred both Google and WhatsApp at a frequency of 3/30, diploma teachers preferred WhatsApp at a frequency of 4/30, while degree teachers preferred Google too just like their certificate counterparts at a frequency of 5/30. However, both certificate, diploma, and degree teachers list liked the Zoom Meet application as a digital application that promoted learner participation in lower primary classes.

As manifested from Figure 4 above, all three 3 digital teaching applications that were presented under study were mostly preferred by teachers. However, Google Classroom was mostly preferred at an average frequency of 10/30, representing 34.1%, while Zoom was the list preferred digital application with an average frequency of 8/30, representing 26.6%. Most smartphones and computers are purchased with an inbuilt Google application, which makes Google Classroom more accessible and familiar than other applications. To verify the availability and use of these applications, the 91 sampled learners of P1-P3 were further observed covertly during lesson time which the teachers had to extend for the small number of learners to be observed. The results were computed in Table 5 below.

Table 5: Digital applications as observed by the learners

Digital applications	Can recognize		Cannot recognize		P value
	<i>frequency</i>	<i>percentage</i>	<i>frequency</i>	<i>percentage</i>	
Google Classroom	41	45.1%	50	54.9%	0.344
Zoom meet	28	30.7%	63	69.3%	
WhatsApp	16	17.5%	75	82.5%	
Others; YouTube	11	13.7%	80	87.9%	

Table 5, showed that Google Classroom was the most recognizable digital application by the learners with a frequency of 41 (45.1%), while YouTube was the list recognized with a frequency of 11 (13.7%). This could be associated with how learners found it easy to physically identify the Google Classroom through video and audio connection which was easily re-directed by the teachers as commonly found in smartphones as an inbuilt application. With the P-value for all three classes is greater than 0.05, it meant no difference between the digital applications that can be recognized and those not recognized among the learners in all the three classes.

The findings from Tables 5, agreed with the excerpt from the head teacher's interview in Zone 1 who said;

“Google Classroom can connect many learners with both audio and video content class, it can be accessed by many learners, promotes active learner involvement, promotes sharing among learners, is good for the backup recording of information, and allows learners to meet online without the teacher, promotes physical interactions in the virtual world, makes lesson

demonstration easy, many learners can join classes virtually, promotes distance learning”. (head teacher zone one)

The above excerpt was further added by another head teacher in zone 2 who in his interview said;

“Google Classroom makes virtual teaching easier, allows learners to interact with each other and with the teacher, learners work can be posted and submitted via Google Classroom, it is easier to use by teachers, interactive virtual classes, aids online research, accommodates many learners, its participatory to both learners and teachers, it is inclusive in terms of audio and visual, serves many learners at the same time, has large database, security and information privacy can be achieved and learners can update lessons easily online...” (head teacher zone 2)

The official from OPM stated in one of his responses during the interviews that;

“zoom is not learner-friendly as it is always used by officials to conduct office meetings, which means Zoom is not good for lessons, might need very good internet and ICT skills to operate it...” (OPM education official in Bidibidi)

Findings of the head teachers in zone 1 indicated that the YouTube application observed as the least in his interview was that;

“It is not interactive, not easy to use in strong network locations, not easy to access information as the video contents do not allow changes, promotes viewing and listening only, yet learner participation is active engagement which is learner-centered, it is mostly adult facing content and does not favor many learners at the same time to use....” (head teacher zone 1)

Findings from another head teacher in zone 2 when interviewed mentioned that;

“WhatsApp makes teachers to get addictive to social media just to chat in person and read other people's posts which add no value to their teaching profession and ethics...” (head teacher zone 2)

The overall findings indicated that Google Classroom was more preferred digital application (app) for lesson activity interactions as compared to YouTube, WhatsApp, and Zoom.

4.4 Digital teaching methods that enhance learner participation.

This was the third objective of the study which was set to investigate whether there was a relationship between digital teaching methods and learner participation in primary school classes in the Bidibidi refugee settlement. These results were obtained from 30 lower primary class teachers, 91 lower primary class learners, and 10 head teachers plus 2 OPM officials from Bidibidi. Figure 5 below presents the information given by the 30 teachers on digital teaching methods and learner participation in lower primary school classes.

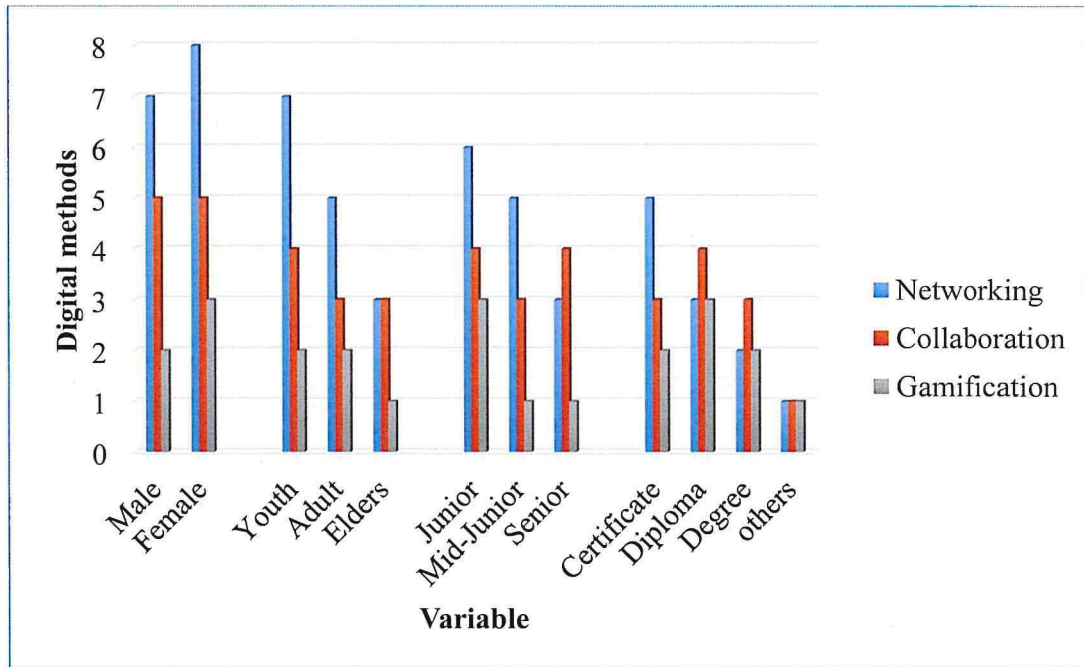


Figure 6: Digital teaching methods as given by the teachers

Figure 5, revealed that both male and female teachers preferred networking as the best digital method at a frequency of 7 and 8 out of 30 for teaching lower primary class learners as compared to collaboration and gamification. When it came to the age variable of teachers, still networking was the most preferred digital method with a frequency of; 7/30 by youthful teachers, 5/30 by adult teachers, and 3/30 by elderly teachers who also indicated the same preference for the collaboration method for teaching lower primary school classes. With experience categorization of teachers, the results still presented networking as the most preferred digital method at a frequency of 6/30 by junior teachers, and 5/30 by mid-junior teachers, but senior teachers preferred collaboration instead at a frequency of 4/30. When we looked at the qualifications of teachers, certificate teachers outstandingly preferred using the digital networking method at a frequency of 5/30, while diploma and degree teachers preferred the collaboration method slightly above networking at a frequency of 4 and 3 out of 30 respectively. However, other teachers agreed with both methods as preferable.

Figure 5 above, overall showed that teachers indicated some interest in both methods. However, networking was reported as the most preferred digital teaching method highly used by teachers to promote learner participation at an average frequency of 14/30 representing 45.8%, while gamification was the lowest digital method preferred by teachers in promoting learner participation with an average frequency of 6/30 representing 19.1%. This was agreed by the teachers at all levels of variables studied as presented in the above composite bar graph. Most teachers found networking more correlated with digital teaching devices and digital teaching applications than other methods presented to them in this study.

To further verify this data, 91 learners in lower primary classes selected for this study were observed covertly with digital lesson activity. The results were tabulated and presented in Table 6 below.

Table 6: Digital methods as observed by the learners

<i>Digital applications</i>	<i>Observed</i>		<i>Not Observed</i>		<i>P value</i>
	<i>Frequency</i>	<i>percentage</i>	<i>Frequency</i>	<i>percentage</i>	
Networking	38	47.5%	53	58.2%	0.332
Collaboration	34	42.5 %	57	63.3%	
Gamification	21	26.3%	70	76.9%	

Table 6 above, showed that networking was most frequently observed at 38 (47.5%), while gamification was the least frequently observed digital method at 21 (26.3%). Learners found it more interesting to interact with online content as it was automated to unfold itself gradually into more and more interesting parts which encouraged active participation. Some kind of puzzle format content in varied themes of a given subject. Since the P-value for all three classes is greater than 0.05, it meant no difference between the digital methods that can be observed and those not observed among the learners in all the three classes.

The above findings in Figure 5 and Table 6, were in congruence with the results from key-informants interviews conducted with study participants as in the excerpt below;

“networking easily enables availability of internet, it promotes self-learning, research links the present information with the past hence access to new information through the internet, quick virtual feedback sharing...”. (head teacher zone 1)

Another participant in the interview also added that;

“networking builds confidence in teachers and learners, makes learners active, it allows learners share their experiences, phased learning, learner-centered, inspires own learning...”. (head teacher zone 1)

On the other hand, a participant in his interview justified that;

“...gamification ensures learners in lower primary learn best through play only yet there are other subjects that require much attention and orderliness, gamification in large classes is uncontrollable with the one-teacher system in Uganda...” (head teacher zone 1)

Also, one other key informant added that gamification;

“Learners become exhausted faster with games, learners in lower primary enjoy games as a co-curricular lesson, additional learning material are lacking

to support classroom games and there are no spaces in the class to enable game methods” (OPM education and Social Services Officer)

Table 7 above illustrates that; Attendance had a moderate level of variability with an SD of 0.892. Access had a low level of variability with an SD of 0.976. Performance had a low level of variability with an SD of 0.986. Completion had a very low level of variability with an SD of 1.053. These results are relative to each other and not absolute.

This study further employed a multiple regression analysis to evaluate the degree to which digital teaching, characterized by its constructs of digital devices, digital applications, and digital methods, served as a predictor for learners’ participation.

Table 7: Descriptive statistics on learner participation

Variable	Min	Max	Mean	SD	Interpretation
Attendance	1	5	3.33	0.892	Moderate
Access	1	5	2.53	0.976	Low
Performance	1	5	1.94	0.986	Low
Completion	1	5	1.80	1.053	Very Low

From the ANOVA table 8 above, the findings suggested that the regression model effectively predicted the dependent variable. The goodness of fit was confirmed by the significant F-value (F= 386.065, P=.000 <0.05), supporting the model's validity.

Table 8: ANOVA analysis

Variables	Sum of Squares	df	Mean	
			Square	F
Digital teaching	47.812	3	15.937	386.065
Learner participation	1.073	26	0.041	
Total	48.885	29		

a. Predictors: (Constant), Digital methods, Digital applications, Digital devices

b. Dependent Variable: Learners' participation.

For the individual constructs, using Beta values, the results revealed that Digital devices positively predicted learners' participation at (Beta = **0.280**, $p=0.019$). This means that a unit increase in digital device usage leads to a 0.280 increase in learners' participation, and a unit decrease in digital device usage leads to a 0.280 decrease in learners' participation.

For Digital applications, it was the highest predictor, it positively predicted learners' participation at (Beta =0.575, $p=0.009$), this implies that a unit increase in usage of digital applications leads to a 0.575 increase in learners' participation and a unit decrease in usage of digital applications leads to 0.575 decreases in learners' participation.

Lastly, Digital methods were the least predictor of learners' participation. It was also found to be positively predicting learners' participation at (Beta =0.138, $p=0.027$), this implies that a unit increase in digital methods leads to a 0.138 increase in learners' participation, and a unit decrease in digital methods leads to a 0.138 decrease in learners' participation. These results indicated that Digital applications have a stronger relationship with Learners' participation than Digital devices and Digital methods.

The table below shows the summary of the coefficient of digital teaching as a predictor of learner participation which is the dependent variable under study.

Table 9: Coefficient

Variable	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	-0.023	0.128		-0.179	0.859
Digital devices	0.320	0.237	0.280	1.349	0.019
Digital applications	0.577	0.204	0.575	2.831	0.009
Digital methods	0.160	0.249	0.138	0.642	0.027

a. Dependent Variable: Learners' participation

The results agreed with the cognitivism theory applied to this study stating that the primary responsibility of the teacher was to create a collaborative problem-solving environment through scaffolding, where learners become active participants in their learning. From this perspective, a teacher acts as a facilitator of learning rather than an instructor. Digital teaching in this study results was the pre-existing conception of learners' environment to activate their curiosity to learn naturally requiring a teacher to only guide and scaffold that innate need of the learner.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS.

5.0 Introduction.

This chapter provided the summary, conclusion, and recommendations of the study, addressing the research objectives and questions of the study. The chapter began with a discussion of the findings as informed by the objectives of the study. This is followed by the conclusions and then finally, the recommendations of the study.

5.1 Discussions.

5.1.1 Digital teaching devices that can improve learner participation.

The findings from this objective revealed that participants have reported good perceptions about digital devices, with radios observed as the most preferred teaching and learning devices in lower primary school classes. Learners observed showed some level of interest in digital devices as a way of enhancing learner participation. These findings agreed with Purcell, Buchanan and Friedrich (2013), who stated that digital devices allowed learners and teachers to participate in the curriculum through the use of a wide range of digital devices including desktop computers, laptops, digital cameras, mobile phones, tablets, and smart boards. Thus, when these devices are used effectively in the curriculum and instruction, they enhance learning in significant ways.

Teachers in lower primary schools preferred using digital devices, especially digital radio sets, as evidenced by the moderate results presented. This statement agreed with Marzano (2003), that learners spend additional time involved in collaborative work, participate more in project-based instruction, produce writing of higher quality and greater

length, gain increased access to information, improve research analysis skills, and spend more time doing homework using the computers.

When it came to head teachers and other key informants, digital devices which included the digital radio sets were still the most preferred digital teaching device. These findings showed that learning using either digital radio sets or related simple digital equipment like telephones, smartphones, and tablets influenced personal and self-paced learning of children, especially in refugee communities, which in turn motivates them to stay at school, and actively participate in good academic performance. These findings agree with those of Geddes (2004), who showed that the impact of educational technologies including digital teaching devices in emergency primary schools can alter positively the learner's academic outcomes. He emphasized that the character of education and learning at home and everywhere can be nurtured through mobile teaching technology which facilitates new academic needs that extend beyond the school premises.

5.1.2 Digital teaching applications that can enhance learner participation.

According to the findings, the majority of the participants reported with Google Classroom application as the most preferred digital teaching application which had a higher positive impact on promoting lower primary learner participation in refugee-hosting schools. However, most of the participants disagreed with WhatsApp's digital application stating it was preferred for sending messages and sharing personal information through Smart telephones only. WhatsApp was a less preferred digital teaching application by the participants because it makes teachers to get addictive to social media just for informal chatting with friends. Google Classroom was most preferred since it allowed for both teacher and learner interactions and research. These results findings agreed with Vural (2013), who

mentioned that at times grade learners need to consult the teachers on certain digital teaching applications to scaffold better learning ideas using relevant digital teaching platforms.

Findings revealed that participants could apply digital applications to promote learner participation. In consensus with Moeller and Reitzes (2011), lower level-grade learners, including teachers, anticipated being connected to digital learning platforms for self-paced and personalized learning. Therefore, digital applications such as; Twitter, Blogs, Wikis, Google Meetings, and some child-centered digital applications are useful in engaging, instructing, and assessing learning. This statement agreed with that of Abe and Jordan (2013), who stated that digital applications constituted powerful study tools that inspired second-language interaction among learners and its tremendous potential to activate learners' involvement.

5.1.3 Digital teaching methods that promote learner participation.

In this study, the results indicated that digital networking was the most preferred digital method that correlated with promoting lower-class learner participation in refugee settlements. Whereas collaboration and gamification influenced learner participation least, these findings agreed with Krause, Portolese, and Bonner (2017), that there was likely a positive relation between digital teaching methods and lower-grade learner active participation. He stated that the field of education utilizes digital pedagogies to motivate learners through practical drills, structured activities, and problem-solving which then improves active participation.

The study by Faja (2013), conceded that virtual collaborative activities correlated with the potential to keep infant class learners engaged, create a sense of community in online classes, and allow them to participate, experience, and practice virtual teamwork skills. In this study, this fact was proved by participants who indicated that; networking easily promoted self-learning, and project work, linked the present information with the past

hence access to new information through the internet, and quick virtual feedback sharing. Since most teachers have the basics of accessing lessons using digital methods through related digital devices and digital applications, this implies that they are in a better position to participate in digital lesson activities.

From the hypothetical analysis of the two variables under study and presentations on both qualitative and quantitative data, empirical results indicated that digital teaching methods played an important role in influencing learner participation in lower primary school classes in Bidibidi. The results positively predicted learners' participation. This implied that a unit increase in digital methods leads increase in learners' participation, and a unit decrease in digital methods leads to a decrease in learners' participation.

5.2 Conclusion.

This study has shown that participants mostly used radios as the most preferred digital teaching devices to enhance learner participation in lower primary school classes in Bidibidi much as the other digital teaching equipment understudy presented to them was familiar. Although radio sets presented learning opportunities such; (as “radios are available and reliable to both teachers and learners, it is simple to use, it attracts lower primary school learners' attention to listen, promotes listening skills acquisition which is the basis of lower primary education”. Headteacher zone 1). Learners fail to explore the learning opportunities that are fancily presented by other digital devices like; computers, tablets, smartphones, and televisions in an explosively digital growing society, refugee settlement communities inclusive.

The study also reported that Google applications were preferred to other digital applications understudy. Much as google application presented the greatest learning opportunities for the promotion of lower primary learner participation such as; (“Google

Classroom can connect many learners with both audio and video content in-class activities, it can be accessed by many learners at the same time, promotes active lower primary classes learners' involvement, promotes sharing among learners, good for back up recording of information, allows learners to meet on line without the teacher, promotes physical interactions in virtual world, makes lesson demonstration easy, many learners can join classes virtually, promotes distance learning". Headteacher zone one). Exploring other digital learning applications such as YouTube, and Zoom could as well address other dynamic learning needs that promote lower primary learner participation in the Bidibidi refugee settlement.

With the research hypothesis, the study results showed that participants had more preference for networking as the most digital method to promote lower primary learner participation in Bidibidi refugee settlement as compared to gamification, and collaboration. Much as networking as a digital method presents some learning opportunities such as; ("networking builds confidence in teachers and learners, makes learners active, it allows learners share their experiences, phased learning, learner-centered, inspires own learning". Headteacher zone 1). Maximizing all other digital teaching methods could allow refugee learners from lower primary school classes to interact with different content activities more uniquely and engagingly.

5.3 Recommendations.

The key education stakeholders in the Bidibidi refugee settlement such as education implementing partners, ERP, OPM, and UNHCR have to play a role in upholding digital teaching methodology as innovation in the refugee hosting community for lower primary school class learners in today's digital society. Invest their education support, donations, and human capital into digital resourcing and equipping. This would increase the digitalization

of even primary schools in refugee settlements beyond only digital radio usage as the most available in schools and communities.

To promote the utilization of digital applications in teaching in refugee lower primary school classes, school headteachers, teachers and parents in refugee hosting schools should collaborate to use the simplest possible digital devices mentioned in this study plus others. Engage with children to be active and creative in the use of active learning with digital teaching approaches such as; instructions, digital games, revisions, summarizing learnt concepts, and improving digital teaching time.

The school community leadership of Bidibidi refugee settlement include; Refugee Welfare Councils (RWCs), Local Councils (LCs), Religious Leaders (RLs), and Para-Social Workers (PSWs) should play advocacy, mobilization, sensitization, and watchdog role in ensuring primary school learners enroll to schools and have access to be taught using digital teaching devices and methodologies. Also, as managers of government-aided primary schools in which this study was conducted, the school community leadership should own digital teaching initiatives in their schools and popularize them among the community members, parents, and well-wishers. This could promote the integration of digital teaching methods stated in this study beyond only networking as preferred by the participants reached in this study.

The study findings were limited to the Bidibidi refugee settlement in Yumbe, Uganda. Thus, studies on the same topic could be conducted in other refugee settlements in urban and rural areas to establish the applicability and to inform policy comprehensively.

There is a need to conduct studies on digital teaching and learner participation with different quantitative and qualitative designs, methods, and sampling techniques to

determine alternative results. This could inform of different interventions by education policy actors and implementers. Such studies would help to establish the nature and trend of the availability of digital equipment and facilities and the manner and degree in which they are utilized.

The study needs to be undertaken to find out the reason behind the discrepancies in the availability of digital teaching facilities between public and private schools, and humanitarian and development community schools.

Further studies can also focus on determining whether teachers 'are motivated to teach with digital devices as opposed to traditional teaching materials.

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APPENDICES

Appendix 1: Consent form

Kyambogo University

P.O. Box 1

Contact: 0777848851/0702088452

Dear participant,

Re: Consent to participate in a study on “Digital teaching and Learner participation in lower primary school classes in Bidibidi Settlement, Yumbe District-Uganda”.

I am Joshua Oluga a student at Kyambogo University pursuing a Master’s Degree in Early Childhood Education currently and I am in the research phase of the study. Your consent/assent is being sought to participate in this academic research aimed at determining the relationship between Digital Teaching and Learner participation in the Bidibidi refugee settlement, Yumbe District.

The study was approved by Kyambogo University and permission was obtained from OPM Bidibidi refugee settlement authorities. Your involvement in this study shall be voluntary and the methods being used are non-invasive and shall have no negative effect on your health or life. The findings of the study shall be shared with you upon successful approval of the report by the University.

Therefore, should you agree to participate in this study, please express your willingness by signing in the space below and proceeding with the rest of the questionnaires/interviews.

Participant Tel no/ID number:

Signature/thumb:

Date:

Annex 2: Research tools

1. Interview guide.

12 key informants (10 Headteachers, 2 Education officials from OPM)

Date of collection: _____ *Nationality:* _____ *Gender:* _____

Age: 18-24 ____, 25-30 ____, 31-35 ____, 36-40 ____, 41-45 ____, 45+ __.

Designation: _____ *school/district/OPM:* _____ *Zone:* _____ *Block:*

No. of years as administrator/headteacher: _____ *No. of places served:*

LEARNER PARTICIPATION IN LOWER PRIMARY SCHOOL CLASSES

1. According to you as an education administrator, what is learner participation in lower primary school classes?
2. Among the four indicators of learning below, which one means the learners in lower primary school/level are participating in learning according to you?

(PLEASE CHOOSE ONE)

- i. Access _____
- ii. Attendance _____
- iii. Performance _____
- iv. Completion _____

3. Do learners in lower primary/ level one classes in Bidibidi show the indicators you have mentioned above?

If not, what do you observe as the most limiting factors preventing learner participation in lower primary school classes/level one in the Bidibidi district?

4. Which of the digital teaching approaches below may best solve the challenge of learner participation in lower primary school classes if introduced in Bidibidi?
 - a) Provision of digital teaching devices to schools for teachers and learners,
 - b) Equipping the lower primary classes with digital teaching skills,

- c) integrating digital teaching methods into lower primary school curriculum,
- d) others specify _____

DIGITAL TEACHING IN LOWER PRIMARY SCHOOL CLASSES

- 5. What do you understand by teaching with digital technology? _____
- 6. Do you agree that learner participation challenges can be addressed through the use of digital teaching approaches?
 Yes No
 If yes, give a reason.

If not why?

- 7. Which of the following digital devices actively promote lesson preparation, delivery, and assessment when the teacher uses.

PLEASE CHOOSE ONLY ONE

- 1. radios _____
- 2. computers, tablets, laptops _____
- 3. telephones, smartphones _____
- 4. others, please specify _____

- 8. As an education administrator which **ONE** of the above digital devices would you prefer for your teacher for lesson preparation and delivery,

Mention the reason for the choice of the devices.

- 9. When teaching with digital technologies, teachers may use digital applications to plan and prepare their lessons.

- 10. Which **ONE** of these digital applications would you advise the teachers to use in their lesson delivery;

- 1) WhatsApp _____
- 2) Zoom meet _____
- 3) Google Classroom _____
- 4) others please specify _____

Give **one** reason why you chose that digital application

11. When teachers are teaching using the above digital devices and applications, they may apply the following digital methods.

1. **Gamification**-playing digital learning games,
2. **Collaboration**-sharing together with others learning ideas and
3. **Networking**-digital learning connections to search for new ideas

As an education administrator, which **ONE** of the listed digital methods above would you recommend your teachers apply in their lesson delivery and assessment?

Why the choice of the digital method above? _____

SECTION B: DIGITAL TEACHING DEVICES

In section B, rate your response using the Likert scale defined as follows; 5= Very high, 4= High, 3= Moderate, 2= Low, and 1 = Very low. Please tick only one box per variable according to your preference.

	Variables	Response options <i>(please tick one box in each line as per your preference)</i>				
		Very high	High	moderate	Low	Very low
B1	Digital radio set	5	4	3	2	1
B2	Computers/tablets/ laptops	5	4	3	2	1
B3	Telephones/smartphones	5	4	3	2	1
B3	For other digital devices, please specify the name and rate _____	5	4	3	2	1

SECTION C: DIGITAL TEACHING APPLICATION

In this section, rate your responses using the Likert scale defined as follows; 5= Very high, 4= High, 3= Moderate, 2= Low, and 1 = Very low. Please tick the appropriate scale cell for your answer on the most digital learning applications used in facilitating teaching in lower primary

S/N	Variables	Response options <i>(Please tick one box per line as per your preference)</i>				
		Very high	High	Moderate	Low	Very low
C1	WhatsApp	5	4	3	2	1
C2	Google Classroom	5	4	3	2	1
C3	Zoom meet	5	4	3	2	1
C4	For other digital application, please specify the name and rate _____	5	4	3	2	1

SECTION D: DIGITAL TEACHING METHODS

In this section, rate your response using the Likert scale defined as follows; 5= Very high, 4= High, 3= Moderate, 2= Low, and 1 = Very low. Please tick the appropriate scale cell for your answer on digital learning methods.

SN	Variable	Response options (Please tick one box per line as per your preference)				
		Very high	High	Moderate	Low	Very low
D1	Gamification -playing digital learning game	5	4	3	2	1
D2	Collaboration -sharing together with others learning ideas and	5	4	3	2	1
D3	Networking -digital learning connections to search for new ideas	5	4	3	2	1
D4	For other digital method, please specify the name and rate _____	5	4	3	2	1

SECTION E: LEANERS' PARTICIPATION

In this section, please rate the contributions of digital teaching to learner participation. The answer will be rated using a Likert scale defined as follows; 5= Very high, 4= High, 3= Moderate, 2= Low, and 1 = Very low. Please tick the appropriate scale cell for your answer on learner participation.

SN	Variable	Response options (Please tick one box per line as per your preference)				
		Very high	High	Moderate	Low	Very low
E1	Access (learners have opportunities to enter class with digital teaching)					
E2	Attendance (learners present in the digital teaching classes)	5	4	3	2	1
E3	Performance (active achievement or learning activity in digital teaching class)	5	4	3	2	1
E4	Completion (finishing study year and getting promoted into the next class as motivated by digital teaching)	5	4	3	2	1

3. Observation checklist

Observation of digital lesson activity going on with at least 9-10 learners in either P1, P2, or P3

classes in the 10 selected primary schools in Bidibidi.

Date of collection: _____ *School:* _____ *Class/Level:*

Settlement: _____ *Zone:* _____ *Block:*

No.	Digital devices used in the lesson activities	Observed	Not Observed	Learner participation indicators observed (retention, access, promotion, performance, attendance)
1.	Computers, tablets, laptops			
2.	Digital radio sets			
3.	Telephone/smartphones			
4	Others observed			
B	Digital Applications applied to lesson activities	Recognized	Not Recognized	Learner participation indicators observed (retention, access, promotion, performance, attendance)
1	Google meet			

2	Zoom meet			
3	WhatsApp			
4	YouTube			
5	Other digital child apps			
C	Digital Methods practiced in class activities	Observed	Not Observed	Learner participation indicators observed (retention, access, promotion, performance, attendance)
1.	Gamification			
2.	Collaboration			
3.	Networking			
4.	Other digital child-centered methods			

Appendix 3: Maps and photos
Bidibidi in numbers by 2016

Bidi Bidi in numbers



Area **250 square km**

Opened **Sep 2016**

Scale of arrivals

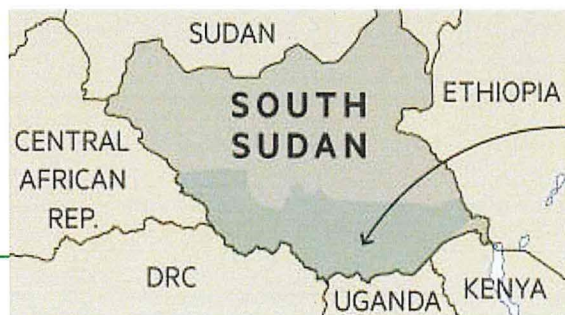
1,000-7,000 a day

Number of refugees

272,000

Inflows **None**

(Bidi Bidi was declared full in December. New arrivals go to Imvepi settlement)



Equatoria region of
South Sudan

FT

Bidibidi refugee statistics May 2021



Uganda - Refugee Statistics May 2021 - Bidibidi

Total Population
239,074

Total Households
42,749

Male (85%)
203,058

Female (2%)
5,824

Total Refugees
239,074

Total Asylum-Seekers
0

Female (52%)
125,476

Male (23%)
55,906

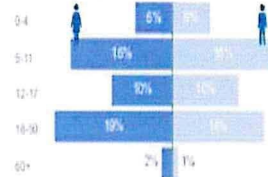
Zones - Top 10

Level 3	HHs	Individuals
Zone 3	11,230	55,542
Zone 2	8,417	52,498
Zone 5	9,599	51,424
Zone 1	7,421	45,458
Zone 4	6,076	33,115
Zone VI	2	42
Zone K	1	8
Zone III	1	5
Zone I	1	1
Zone IV	1	1

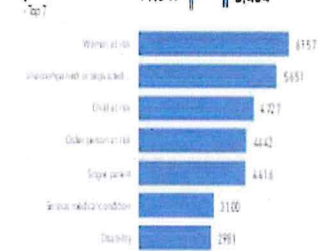
Country of Origin - Top 5

Country of Origin	Total
South Sudan	214,903
Sudan	103
Democratic Republic of the Congo	66
Burundi	1
Cong. Republic of the	1

Age & Gender Breakdown

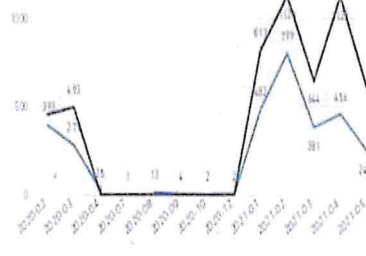


Specific Needs - Top 7



New Registration by Month

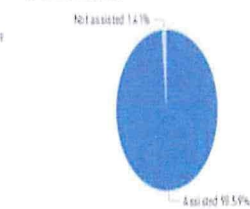
● New Registration ● Birth



Occupation - Top 5



Assistance Status



Source: Statistics - OFIM (ProGies version 4)

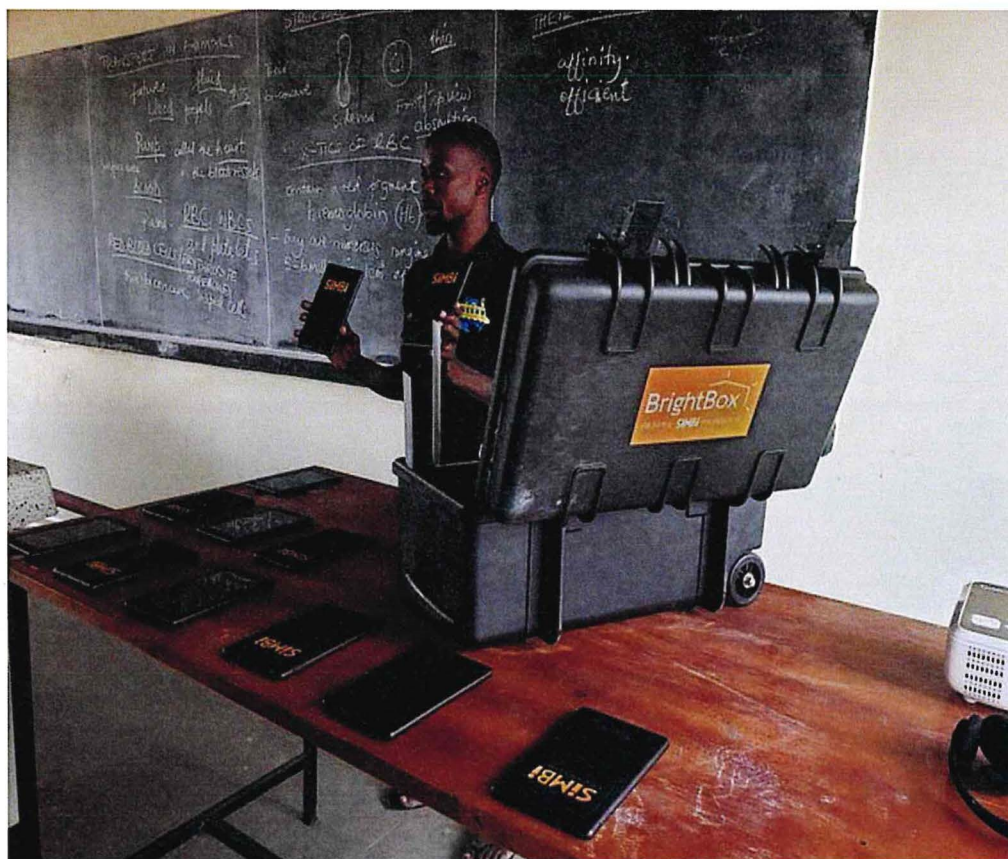
Feedback: ugabareg@unhcr.org

Creation date: 31-May-2021

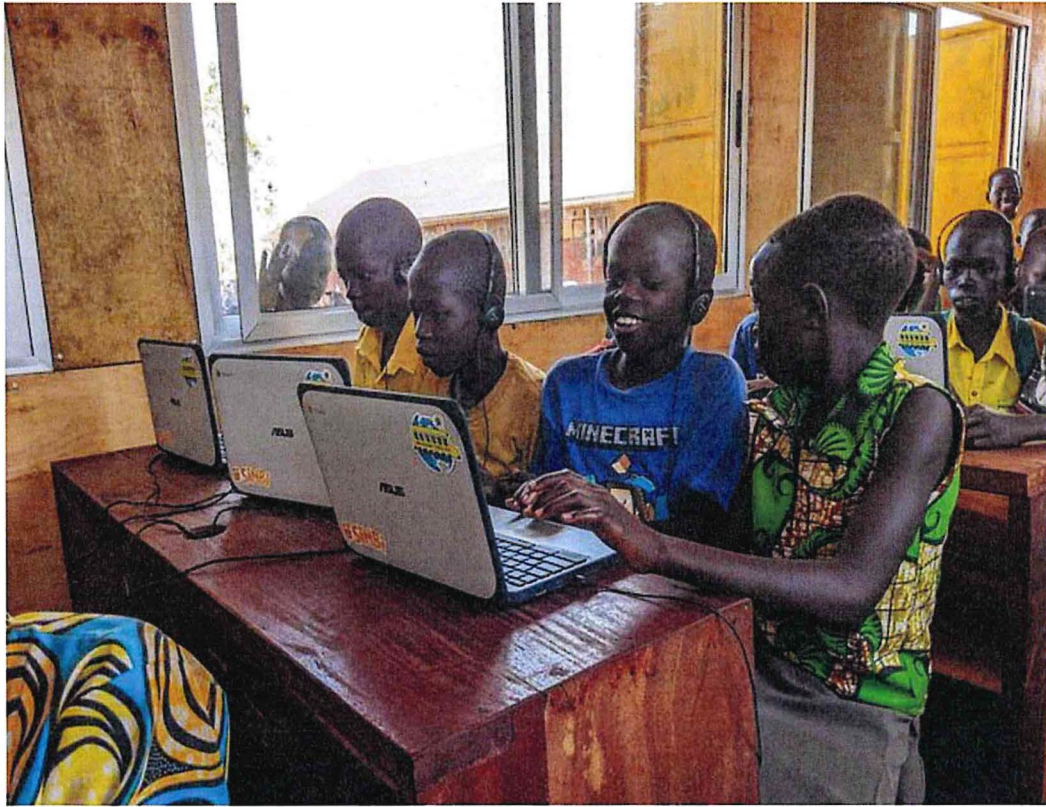
Photos of digital classrooms in Bidibidi refugee settlement



Primary School pupils in Bidibidi Refugee Settlement, Uganda eager to enter BrightBox.



A teacher technology training session on using the BrightBox Micro.



Pupils inside the BrightBox classroom in Primary School in Bidibidi Refugee Settlement, Uganda.



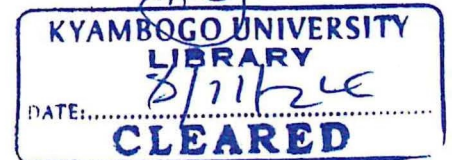
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DIGITAL TEACHING AND LEARNERS' PARTICIPATION IN LOWER
PRIMARY SCHOOL CLASSES IN BIDIBIDI REFUGEE SETTLEMENT,
YUMBE DISTRICT



BY

JOSHUA OLUGA

REGISTRATION NUMBER: 18/GMEC/19818/PD

A DISSERTATION SUBMITTED TO THE DIRECTORATE OF
RESEARCH AND GRADUATE TRAINING IN PARTIAL FULFILLMENT
OF THE REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER
OF EDUCATION IN EARLY CHILDHOOD DEVELOPMENT OF
KYAMBOGO UNIVERSITY

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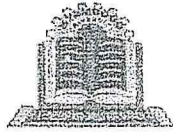
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Faculty of Education
Department of Early Childhood Education

INTERNAL MEMO FROM:

Chair, Department Graduate Board,
04th July 2022

TO: Mr. Oluga Joshua
C/o Early Childhood Education
Department

REF: 18/U/19810/GMEC/PE

REF: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that the Faculty Graduate School Board at its meeting of 3rd April 2019 approved your research proposal for the Master of Education (Early Childhood Education). You can now proceed to the field for data collection.
Thank you.

Yours sincerely,



Assoc. Prof. EJU GODFREY

FOR: CHAIR, FACULTY GRADUATE BOARD

CC Chair, Early Childhood Education Department Graduate Board

Supervisors

- 1 Dr. Katigo ^{Kaheru} Educational
Psychology
- 2 Dr. Rukundo Peter Milton
Food and Nutrition